

with SEQ ID NO: 2) for combination with a heterologous promoter that is functional in a plant cell for use in producing transgenic plants that are tolerant to damage by an aryloxyalkanoate herbicide.

As a way to identify genes which possess herbicide degrading activities *in planta*, it is possible to mine current public databases such as NCBI (National Center for Biotechnology Information). To begin the process, it is necessary to have a functional gene sequence already identified that encodes a protein with the desired characteristics (i.e., α -ketoglutarate dioxygenase activity). This protein sequence is then used as the input for the BLAST (Basic Local Alignment Search Tool) (Altschul et al., 1997) algorithm to compare against available NCBI protein sequences deposited. Using default settings, this search returns upwards of 100 homologous protein sequences at varying levels of sequence identity. These range from highly identical (85-98%) to very low identity (23-32%) at the amino acid level. Traditionally, only sequences with high homology would be expected to retain similar properties to the input sequence. In this case applicant chose only those sequences with $\leq 50\%$ homology. **Proceeding contrary to the accepted wisdom (i.e., selecting low sequence identity homologs to test) is an indicia of nonobviousness.** Surprisingly, applicant discovered that cloning and recombinantly expressing homologues with as little as 31% amino acid conservation can be used to impart commercial levels of resistance not only to the intended herbicide, but also to substrates never previously tested with these enzymes.

Thus, the subject AAD-12 enzyme was only 1 of over 100 BLAST search results having some degree of identity with *tfdA*. As discussed above, there were great numbers of other possible choices that could have been selected and would have logically been more likely to provide phenoxy auxin tolerance when expressed in a plant.

Furthermore, the subject invention offers surprising advantages that none of the cited prior art references taught. As illustrated by the subject specification, the data of Table 1 demonstrates AAD-12 is able to degrade the pyridyloxyacetates auxins (e.g., triclopyr, fluroxypyr) in addition to achiral phenoxy auxins (e.g., 2,4-D, MCPA, 4-chlorophenoxyacetic acid). Previous to applicants disclosure, there was no expectation that such plants could effectively produce an AAD-12 enzyme to render the plants resistant a phenoxyacetic acid herbicide (such as 2,4-D) and/or one or more pyridyloxyacetates herbicides such as triclopyr and

fluroxypyr. Thus, the subject invention provides many advantages that were not heretofore thought to be possible in the art.

Thus, it is not seen how the secondary references of Schleinitz or Pallett would support the reasonable expectation of success to produce a plant that is resistant to pyridyloxyacetates herbicides and thus protect a crop plant from damage by pyridyloxyacetates herbicide such as triclopyr and fluroxypyr or why a skilled practitioner would select a gene having low sequence identity to *tdfA* for testing. Accordingly, there was no reason to select the nucleic acid of SEQ ID NO: 1, or derivative thereof, to be operably linked to a plant specific promoter, as there was no reasonable expectation that such a construct would produce the desired effect when transfected into plant cells.

The Examiner has cited Schleinitz as teaching the nucleic acid sequence of SEQ ID NO: 1 which encodes the protein of SEQ ID NO: 2 and contend it was obvious to try to substitute this gene for *tdfA* aryloxyalkanoate dioxygenase gene disclosed in Kaphammer. However, there is no teaching provided by any of the cited prior art to indicate that the *sdpA* bacterial gene would provide tolerance to phenoxy auxin herbicides upon introduction into plant cells. On page 9 of the office action the Examiner makes reference to Schleinitz et al as teaching "that *tdfA* and *sdpA* share substantial structural similarity with group II aKG-dependent dioxygenases". However a careful reading of the reference reveals that Schleinitz is comparing the amino acid sequences of *sdpA* and *rdpA* relative to group II aKG-dependent dioxygenases not to *tdfA* specifically. Due to the unpredictability of the activity of bacterial genes in plant systems, contrary to the Examiner's assertions, there was no reasonable expectation of success based on the combined teachings of Kaphammer and Schleinitz that a plant transformed with the *rdpA* gene would produce a plant having tolerance to a phenoxy auxin herbicide, nor was there any rationale for selectively choosing the *sdpA* gene from the many other *tdfA* -like bacterial genes for combination with a plant promoter.

The Federal Circuit has differentiated between proper and improper applications of "obvious to try" in *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir.). More particularly, two classes of improper obvious to try were exemplified as follows: (1) when what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many

possible choices is likely to be successful; and (2) when what was “obvious to try” was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

As noted above, the subject *sdpA* gene was only 1 of over 100 BLAST search results having some degree of identity with *tfdA*. The Examiner has failed to provide any rationale for specifically selecting the *sdpA* gene from the other 100 candidates other than rely on an improper obvious to try standard requiring one to "try each of numerous possible choices until one possibly arrived at a successful result". However, even such efforts would not be likely to identify the present invention as many of the 100 BLAST search results could potentially produce a plant that exhibits the minimal phenoxy auxin herbicide tolerance (cited by the Examiner as motivation for substituting the *tfdA* gene with the *sdpA* gene) without revealing a protein having the activity of enzymatically degrading a phenoxy auxin herbicide and a pyridyloxy auxin herbicide as required by the claims. Accordingly, the combined teachings of the cited prior art fail to suggest or provide any guidance of how to obtain a gene and recombinant plant that has the functionality of the present claimed invention.

Applicant respectfully requests the withdrawal of the rejection of claims 27-39, 41-54 and 57-58 as being obvious over the combined teachings of Kaphammer in view of Schleinitz et al and Pallett et al.

Claims 27-58 are rejected for obviousness type double patenting over claims 1-20 of US Patent No 8,916,752. Claims 27-58 are rejected for obviousness type double patenting over claims 1-14 of US Patent No 8,283,522. Claims 27-58 are rejected for obviousness type double patenting over claims 1-6, 11-15 and 19-24 of US Patent no 9,944,944. Applicants will file the necessary terminal disclaimers to overcome these rejections upon a finding of allowable subject matter.

With the entry of the foregoing amendments, the application is believed to be in condition for allowance. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Respectfully submitted,

/John P. Breen/

John P. Breen
Attorney Reg. No. 38,833

JPB:gl
Indianapolis, Indiana 46204
317-261-7940

Exhibit A: Alignment of tfdA-type proteins

	1	50
BAB92964.1 (TfdARd)	(1) -----	MTNLR
BAB92966.1 (TfdAHw)	(1) -----	MTNLR
WP_011171694.1 (TfdAAx)	(1) -----	MTTSE
WP_031942830.1 (TfdABc)	(1) -----	MTTSE
WP_011178399 (TfdA)	(1) -----	MTNAN
US_8283522_B2_2 (aad-12)	(1) -----	MQTTQIT
WP_005771906.1	(1) -----	MNEV
WP_012412111.1	(1) -----	MPTSLTKKIS
WP_010955168.1	(1) -----	MLTKNKIATV
VTQ23612.1 (tauD)	(1) -----	MSEKSTT
WP_011083759.1	(1) -----	MSPIKMIGRHAMSSLAGKQGPYRHMADGAPYETAVE
WP_011031608.1	(1) -----	MTDSARDSARDTATDGTGSEVE
WP_011084919.1	(1) -----	MTAMILSDNVIPRADVI
WP_011031711.1	(1) MSVTSVTSAGPRTLREARIPGDGMYEGRRTLRLPKGWEERPYLEFVV	
WP_041807264.1	(1) -----	MSAVESLLSAPAQFEFR
WP_054985508.1	(1) -----	MPAASLASSSAQPASQFDFR
	51	100
BAB92964.1 (TfdARd)	(7) QHHKFVSENSEDERKPLTKQEI-----DEAGDKSAVLVEHGG-DS	
BAB92966.1 (TfdAHw)	(7) QHHKFVSENSEDERKPLTKQEI-----DEAGDKSAVLVEHGG-DS	
WP_011171694.1 (TfdAAx)	(7) YLHPLFVSDDKALQALSPTEVR-----DEHONDQKAVLVEFGQ-PL	
WP_031942830.1 (TfdABc)	(7) YLHPLFVSDDKALQALSPTEVR-----DEHONDQKAVLVEFGQ-PL	
WP_011178399 (TfdA)	(7) YLHPLFVAGVEDIDREALGSTEV-----EYERLDEKSVLVEFGQ-PL	
US_8283522_B2_2 (aad-12)	(9) PTGATGATITGHHATLDDAGFAA-----EHAWLQNALEFPQG-HL	
WP_005771906.1	(6) PTNLGTEVRGIDVNSKLSDDVIE-----AYEAWSSSTLEFGQ-SM	
WP_012412111.1	(13) PDAPGTTITDLDASQAPEVIL-----QKQALDRHSLFFRDQ-KL	
WP_010955168.1	(11) SNGSGCAETVGFDFNDYDAQDVAE-----YRKIWELQGVNFRDI-DS	
VTQ23612.1 (tauD)	(9) PLGPYGAQISGADLTRPLSDNQFE-----QYHAYERNQVFLRDQ-AS	
WP_011083759.1	(40) KLTPIGAEISGNDGRLSDDVRSNQQMDLHRAAENLVNFFRDQ-HS	
WP_011031608.1	(25) PLAGHGAETRGDLAAGLDAAQVA-----ANRSALRWKVNFFRDQ-RL	
WP_011084919.1	(18) KRAVRGAETRNKLSGDLPEQTIAS-----ENGLLEKVNFFRGQLHL	
WP_011031711.1	(51) PQARTGAEIRGADLSRPLPALRE-----ENRALEWKVLEFFGA-HL	
WP_041807264.1	(19) PLGGVGAETLGLDLSPLNSADFA-----RTHQAFLEDRVLNFFRDQ-RL	
WP_054985508.1	(22) PTEKNGAETVGLDLSRPLNDADFA-----RTHQAHEDRHVNFFRDQ-QS	

	101	150
BAB92964.1 (TfdARd)	(51)	SDDOQAFALNFGERENARGGTYKKEDYRLSSGNNVSNIGKDGKPLPK
BAB92966.1 (TfdAHw)	(51)	SDDOQAFALNFGKRENARGGTYKKEDYRLSSGNNVSNIGKDGKPLPK
WP_011171694.1 (TfdAAx)	(51)	DQDOQAFARNFQLEGG-FIKYNQRPSRFKYAEADISNVSVDGKVRER
WP_031942830.1 (TfdABc)	(51)	DQDOQAFARNFQLEGG-FIKYNQRPSRFKYAEADISNVSVDGKVAER
WP_011178399 (TfdA)	(51)	SQDOQAFARNFQLEGG-FIKYNQRPSRFKYAEADISNVSVDGKVAQR
US_8283522_B2_2 (aad-12)	(52)	ENBOQTFARFGAERIGGGDEVAISNVKADGTRQHSAPAEWDDMMKVI
WP_005771906.1	(50)	TPDOQKFSRNFGELVSY----TRSQFSEKTQPELINSNTKDGKLG-
WP_012412111.1	(57)	SDKELNFSLYFGALFVPSDETPVLASKPGETPVNIPISNDGGYTGTG-
WP_010955168.1	(54)	TDQHKFKFHHFGAEVIHP--KQLQEGAHPTQKEILVINTTKDGKPSG-
VTQ23612.1 (tauD)	(53)	TPQQORALAQRFGELHIHP-----VYPHAEGNDIIVDTHNDNPP-
WP_011083759.1	(89)	SPQOHAFGRKFGELHFHP-----AAPHEDEDPANMKTYADKNSPR-
WP_011031608.1	(69)	DHAGHAFARLFCEPVVLPARGKASPAGFPEIETTARLESGGRFMGMEHD
WP_011084919.1	(63)	DDAEQESFAIREFGEETPHP-----TLGAIKGTASIEEDSTRAGSR-
WP_011031711.1	(95)	TSQQRDFAGNGALETN-----PILLAGSSDQVRFDKGDGAVP-
WP_041807264.1	(63)	TPDOQAFSRFGEELQIH----VLKQFLLAGHPFIILSNVENGKPIG-
WP_054985508.1	(66)	TPDOQDFSRFGEVLQIH----VLKQFLLVNHPEELINSNVENDKPVG-

	151	200
BAB92964.1 (TfdARd)	(101)	DHRTHLNLGNCIWRSDSSFRPIPAKFSILSARVNPKNNEFADMRAA
BAB92966.1 (TfdAHw)	(101)	DHRTHLNLGNCIWRSDSSFRPIPAKFSILSARVNPKNNEFADMRAA
WP_011171694.1 (TfdAAx)	(100)	DAREVVGNFANQIWRSDSSFOQPAARYSNLSAINLPSSGDNFECDMRAA
WP_031942830.1 (TfdABc)	(100)	DAREVVGNFANQIWRSDSSFOQPAARYSNLSAINLPSSGDNFECDMRAA
WP_011178399 (TfdA)	(100)	DAREVVGNFANQIWRSDSSFOQPAARYSNLSAVNLPSSGDNFECDMRAA
US_8283522_B2_2 (aad-12)	(102)	VG-----NMAWHDSTMPVMQGNFSAEYPAVGRNCFADMRAA
WP_005771906.1	(95)	-----SPVSGRWETDGHNLEVPAGSNLHALETPPESSDNFEANMFAA
WP_012412111.1	(106)	-----ELTFEDHKNIPTPSGSLIYALETPSQSNNTYLNLTNLA
WP_010955168.1	(101)	-----ALGNSEATWETDWFYEREPAGALLRSIALPPTSGDNYVSMYQA
VTQ23612.1 (tauD)	(94)	-----DNDNWETDVEIETEPAGALLAAKEPSTSGNLITSGIAA
WP_011083759.1	(130)	-----ANGEGRSDVSCDLEPPMGSLYIKQCPPESSGNLFANMYAA
WP_011031608.1	(119)	EWLRRRRHTLLRGWCHHGARVDPAATNLRAETVPPYSSDNTRANMAAA
WP_011084919.1	(104)	-----ADLWHTDGTVDAYPKIATLRGIIIPPFPSSDNTVNTASAA
WP_011031711.1	(135)	-----TYENNWTIDVTERERPALGANLQLEVPPESSDNTRADMAAA
WP_041807264.1	(108)	-----LGDAGKWRSDLSKEIPSMGMLYARLPPESSGNLFADQQLA
WP_054985508.1	(111)	-----LGDAGKYWRSDLSKEIPSLGSMIYAQEPPESSGNLFADMHLS

	201	250
BAB92964.1 (TfdARd)	(151)	YDADDETKTETDDICEHSLNYS-----RGSNGFLDYDEEKEMFKPV
BAB92966.1 (TfdAHw)	(151)	YDADDETKTETDDICEHSLNYS-----RGSNGFLDYDEEKEMFKPV
WP_011171694.1 (TfdAAx)	(150)	YDDNPEDFKKEQGERAEHYAENS-----RFLNGDTDYSESQRNAMPV
WP_031942830.1 (TfdABc)	(150)	YDDNPEDFKKEQGERAEHYAENS-----RFLNGDTDYSESQRNAMPV
WP_011178399 (TfdA)	(150)	YDADPRDQSENEGGERAEHYAENS-----RFLNGDTDYSEAQRNAMPV
US_8283522_B2_2 (aad-12)	(144)	YDADSEATRALHQRSARHSLNYSQ-SKLGHVQQAGSAYIGYGMTTATP
WP_005771906.1	(139)	YDAPPSKQRIEDLKVIISRTQSR-P---YNYPDRPAPQAQELAEWVDV
WP_012412111.1	(146)	YDADSTTKERADQLITYNPFLRDR---NAPRSLYRLDKTIPLISIF
WP_010955168.1	(146)	YDTPSYLDAKGRQIFFQSYDAAG---GLRPNKQVPKSDDIREWPGI
VTQ23612.1 (tauD)	(135)	YDASVPFQLNSGLRAEHDFRKSFPEYKYRKTEEHQWRREAVAKNPPS
WP_011083759.1	(172)	YDASSRKAYDGLTALHDGEPIY-R----G--LYANYGVADRPSYPNA
WP_011031608.1	(169)	YDASAPRALNDETERAEHRLGVGYQ-----PRPGDDAYVRHLLHHQTAT
WP_011084919.1	(144)	YLDNAPPQGLADRLWAVHSNAFDYAILARVSEIDKKHLDEVFTKTIYRT
WP_011031711.1	(177)	YDNPRENKERRDGLAVHDFTPG-----FARFYGPERLLPHQDLLEPV
WP_041807264.1	(152)	YDNPANAKAYEGRAVHSYTAHY-EDEVFKGRRPTLSTAQLEEVKEV
WP_054985508.1	(155)	YDTPQHLEDAVEGRSAVHSYTARY-AEGHNAANWRPTLAEQLAQVVEV

	251	300
BAB92964.1 (TfdARd)	(195)	LQRLVRTNPAHGRKSLNYS-----HAGATRGSMPEARLLLRDLTEHAT
BAB92966.1 (TfdAHw)	(195)	LQRLVRTNPAHGRKSLNYS-----HAGATRGSMPEARLLLRDLTEHAT
WP_011171694.1 (TfdAAx)	(194)	SWPLVRTNAGGRKFEFIG-----HAGHIEGRVAGRMMLAEELLEHAT
WP_031942830.1 (TfdABc)	(194)	SWPLVRTNAGGRKFEFIG-----HAGHIEGRVAGRMMLAEELLEHAT
WP_011178399 (TfdA)	(194)	NWPLVRTNAGGRKFEFIG-----HASHIEGRVAGRMMLAEELLEHAT
US_8283522_B2_2 (aad-12)	(193)	LRPLVYNPETGRPSLLIGR-----HAAIIPGNDAAESERFLEGLVSWAC
WP_005771906.1	(185)	AQPLVRRNEVGRKALFAGN----VPWRIEGNPLEESAPLSTFLOEFSV
WP_012412111.1	(193)	PHPLVRTNPEGRKHLYLDNAT----EVENVGNEPEESKLNEQLROHLN
WP_010955168.1	(193)	VHPLVRVNGDSGRQALILGKGVREQDSWIVGNPMDESNDLNAQLWEHTL
VTQ23612.1 (tauD)	(185)	LHPVVRTNPEVGRQALFYNEG----FTTRIVDSEKESKALLSFLFAHIT
WP_011083759.1	(215)	EHPVVRTNPEVGRKALYNRG----FTRHNGIPRDESDANLAYLYQHAE
WP_011031608.1	(214)	VHPLVRVNPETGERVFEVNGY----YVEQIAGNSRPESAAELLEVEQAT
WP_011084919.1	(194)	EHPVVRVNPETGERIVLGN-----LVQNFGVGPKYSGQKLFDLFQSHIT
WP_011031711.1	(221)	EHPVVRTNPEVGRPMFEVNS----FTTRITGNDRDESRLRLRFLFQQA
WP_041807264.1	(201)	VHPLVRTNPEVGRKGFVNEN----FTTRILDPEDESRLRLAEELYAHSI
WP_054985508.1	(204)	SHPVVRTNPEVGRKALFVSEG----FTTRILDPEDESRLRLNEELYAHSV

	301	350
BAB92964.1 (TfdARd)	(240)	QPEFYVHKWTVHDEVMWDNRQTVHRVRRDQSQ-----PRDMRRATVA
BAB92966.1 (TfdAHw)	(240)	QPEFYVHKWTVHDEVMWDNRQTVHRVRRDQSQ-----PRDMRRATVA
WP_011171694.1 (TfdAAx)	(239)	QRKFYVRHSWKVGDEVMWDNRCVSHRGRRDITA-----RREIRRATTL
WP_031942830.1 (TfdABc)	(239)	QRKFYVRHSWKVGDEVMWDNRCVSHRGRRDITA-----RREIRRATTL
WP_011178399 (TfdA)	(239)	QRKFYVRHWNVGDEVMWDNRCVSHRGRRDISA-----RREIRRATTL
US_8283522_B2_2 (aad-12)	(238)	QAPRVAHQWAAGDEVVWDNRCLSHRAEPNDFKLPRVMWHSKLAGRPETE
WP_005771906.1	(231)	QPOFYVRHRWVPGDEVMWDNRSAHKAATVDDKY-----RRLHRTITG
WP_012412111.1	(239)	QRKFYVRHSWKVGDEVMWDNRQATSHYRQADPNE-----RREIKRVSLA
WP_010955168.1	(243)	KGEIFVQQ-WRLGDMVMWDNRCTMHRRDSKSPDH-----IRINHTTTA
VTQ23612.1 (tauD)	(231)	KPEFQVRCAGNQMIRFGITA-----
WP_011083759.1	(261)	NPLFQCRFRWTENAFVWDNRCTQHRAMWDYWPH-----TRSGTRVTNK
WP_011031608.1	(260)	RPEFTVRFRWEPGSAFWDNRATSHLAPGDHAHLD----HPRTNHRVMT
WP_011084919.1	(239)	ALENTVRWSWRDGNVAFWDNRATQHYAVNDYGDQ-----HRLVHRATVA
WP_011031711.1	(267)	VPEFQVRWRWQPGDNVAFWDNRATQHYAVGDYGE-----RVAERVAIE
WP_041807264.1	(247)	RPEFTYRHRWQENDNFWDNRALSHLATGCPNHL-----PRMHRITTIQ
WP_054985508.1	(250)	KPEHTYRHWQANDNVFWDNRSLSHLAGCPAHL-----RRLHRTITQ

	351	373
BAB92964.1 (TfdARd)	(284)	GTQRTVAQEAAE-----
BAB92966.1 (TfdAHw)	(284)	GTQRTVAQEAAE-----
WP_011171694.1 (TfdAAx)	(283)	DNAVV-----
WP_031942830.1 (TfdABc)	(283)	DNAVV-----
WP_011178399 (TfdA)	(283)	DNAVV-----
US_8283522_B2_2 (aad-12)	(288)	GAALV-----
WP_005771906.1	(275)	KRATESRYRKRQA-----
WP_012412111.1	(283)	GSRRF-----
WP_010955168.1	(286)	GRRPV-----
VTQ23612.1 (tauD)	(252)	-----
WP_011083759.1	(305)	GRRPV-----
WP_011031608.1	(306)	GVVPVVDGTPSEPVGSEAGRW
WP_011084919.1	(283)	GVVPVVDGRSSVTRITGDHQAV
WP_011031711.1	(311)	GSRRF-----
WP_041807264.1	(291)	GSRRF-----
WP_054985508.1	(294)	GTAPF-----

Electronic Patent Application Fee Transmittal

Application Number:	15468494			
Filing Date:	24-Mar-2017			
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES			
First Named Inventor/Applicant Name:	Terry R. WRIGHT			
Filer:	John P. Breen/Garla Twyman			
Attorney Docket Number:	14764-262737			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1300	1300
Total in USD (\$)				1500

Electronic Acknowledgement Receipt

EFS ID:	39186701
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen/Garla Twyman
Filer Authorized By:	John P. Breen
Attorney Docket Number:	14764-262737
Receipt Date:	17-APR-2020
Filing Date:	24-MAR-2017
Time Stamp:	13:58:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1500
RAM confirmation Number	E20204GD59164096
Deposit Account	100435
Authorized User	Garla Twyman

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE_Request1.pdf	92508	no	3
			d134123f80900c79285d6059ba558e32ba5b5e48		

Warnings:

This is not a USPTO supplied RCE SB30 form.

Information:

2		Amendment_and_Response_Accompanying_RCE.pdf	193990	yes	23
			0693a36f6a827572d55c003b455def3a60846ebd		

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	23

Warnings:

Information:

3	Transmittal Letter	Supplemental_IDS.pdf	36803	no	3
			b394f361017a458d7e9653bd78cca6e19f1f4484		

Warnings:

Information:

4	Non Patent Literature	Mueller.pdf	454568	no	13
			fc238577e5e9fa762a2f14da02b602c06d8447be		

Warnings:

Information:

5	Non Patent Literature	Hotopp.pdf	248709	no	8
			3839c8bf597ff335b65061f66432e33f1898e59d		
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	32493	no	2
			45c2a71a23de8475e0499c38a1a68b18542047c7		
Warnings:					
Information:					
Total Files Size (in bytes):				1059071	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>Customer No.:</i>	107540	}	FILED ELECTRONICALLY: April 17, 2020
		}	
<i>Group:</i>	1663	}	
		}	
<i>Confirmation No.:</i>	6867	}	
		}	
<i>Application No.:</i>	15/468,494	}	
		}	
<i>Invention:</i>	NOVEL HERBICIDE RESISTANCE GENES	}	
		}	
<i>Applicant:</i>	Terry Wright et al.	}	
		}	
<i>Filed:</i>	March 24, 2017	}	
		}	
<i>Attorney Docket:</i>	14764-262737	}	
		}	
<i>Examiner</i>	David Kruse	}	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Statement is filed pursuant to 37 C.F.R. § 1.56. No representation is intended that a complete search has been made of the prior art or that no better art references than the references cited in this IDS are available. The filing of this IDS shall not be construed to be an admission that the information cited in the IDS is, or is considered to be, material to patentability as defined in §1.56(b). Pursuant to 37 C.F.R. § 1.98(a)(2)(ii), copies of cited U.S. patents and patent publications are not provided herewith; a copy of each cited foreign and non-patent reference is provided herewith for review by the Examiner.

As this IDS is being filed with an accompanying RCE, applicant believe no fees are required for this filing. However, the Commissioner is hereby authorized to charge any fee necessary to affect this filing to our Deposit Account No. 10-0435, with reference to our Matter No. 14764-262737.

Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested. If any further discussion of this matter would speed prosecution of this application, the Examiner is invited to call the undersigned at (434) 220-2866.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read 'John P. Breen', written in black ink.

John P. Breen
Registration No. 38,833
Attorney for Applicants

JPB:gl
(317) 261-7940
Indianapolis, Indiana 46204

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
INFORMATION DISCLOSURE STATEMENT	Applicant(s) Terry Wright et al.	
	Filing Date March 24, 2017	Art Unit 1663

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Document Number	Publication Date	Country	Translation Yes No	

OTHER DOCUMENTS	
	Müller et al, Protein Science (2006), 15:1356–1368
	Hotopp et al, Biochemistry 2002, 41, 9787-9794

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/468,494	Filing Date 03/24/2017	<input type="checkbox"/> To be Mailed
-----------------------------------------------------------------------------------	--------------------------------------------	---------------------------	---------------------------------------

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$420 =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	04/17/2020		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	* 32	Minus	** 32	= 0	x \$100 = 0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	x \$460 = 0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						0
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/MARISSA R BLYTHER/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".						
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/468,494	Filing Date 03/24/2017	<input type="checkbox"/> To be Mailed
-----------------------------------------------------------------------------------	--------------------------------------------	---------------------------	---------------------------------------

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$420 =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

	(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	04/24/2020		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*	32	Minus	** 32	= 0
	Independent (37 CFR 1.16(h))	*	2	Minus	*** 3	= 0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
					TOTAL ADD'L FEE	0
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*		Minus	**	=
	Independent (37 CFR 1.16(h))	*		Minus	***	=
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
					TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.					LIE	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".					/YOLANDA CHADWICK/	
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".						
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.						

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	39262393
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	24-APR-2020
Filing Date:	24-MAR-2017
Time Stamp:	17:11:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	Supp_Response.pdf	46542	no	7
			13526e2bea80f23a7d6c23c88148f642262354a4		

Warnings:

Information:	
Total Files Size (in bytes):	46542
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>Customer No.</i>	107540	}	
		}	
<i>Group:</i>	1663	}	
		}	
<i>Confirmation No.:</i>	6867	}	
		}	
<i>Application No.:</i>	15/468,494	}	
		}	
<i>Invention:</i>	NOVEL HERBICIDE RESISTANCE GENES	}	<u>ELECTRONICALLY FILED ON:</u>
		}	<u>April 24, 2020</u>
		}	
<i>Inventor:</i>	Wright et al.	}	
		}	
<i>Filed:</i>	March 24, 2017	}	
		}	
<i>Attorney Docket:</i>	14764-262737	}	
		}	
<i>Examiner:</i>	David Kruse	}	

SUPPLEMENTAL AMENDMENT AND RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In response to the final Office Action mailed December 20, 2019, Applicant submitted an RCE, and an accompanying Amendment and Response on April 17, 2020. Applicant hereby submits a supplemental response and request consideration of the further claim amendment submitted herewith in conjunction with the response of April 17, 2020. Applicant hereby authorizes the Commissioner to charge any fee necessary to affect this filing, to the account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to our file 14764-262737.

Amendments to the Claims are submitted herewith beginning on page 2.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-26 (Canceled).

27. (Previously presented) A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R, wherein

X₁₀₉ represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

(X)₁₁₁₋₁₃₄ represents a sequence of 24 amino acids;

(X)₁₃₆₋₂₆₁ represents a sequence of 126 amino acids; and

(X)₂₆₃₋₂₇₂ represents a sequence of 10 amino acids.

28. (Previously Presented) The plant cell of claim 27 wherein the AAD-12 protein comprises an amino acid sequence having at least 90% sequence identity with SEQ ID NO: 2 wherein the AAD-12 differs from the amino acid sequence of SEQ ID NO: 2 by one or more conservative amino acid substitutions.

29. (Previously presented) The plant cell of claim 27 wherein said plant cell is dicotyledonous and selected from the group consisting of a cotton cell, a tobacco cell, a canola cell, a soybean cell, and an Arabidopsis cell.

30. (Previously presented) A transgenic plant comprising a plurality of the plant cell of claim 27, wherein expression of said polynucleotide renders said plant tolerant to an

aryloxyalkanoate herbicide.

31. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a phenoxy auxin herbicide.

32. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of 2,4-dichlorophenoxyacetic acid, and MCPA.

33. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin.

34. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of triclopyr and fluroxypyr.

35. (Previously presented) The plant of claim 30 wherein expression of said polynucleotide renders said plant resistant to both a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

36. (Previously presented) The plant of claim 30 wherein said plant further comprises a second herbicide resistance gene.

37. (Previously presented) The plant of claim 36 wherein said second herbicide resistance gene renders said plant resistant to an herbicide selected from the group consisting of glyphosate, glufosinate, ALS inhibitors, inhibitors of 4-hydroxyphenyl-pyruvate-dioxygenase (HPPD), dicamba and inhibitors of protoporphyrinogen oxidase (PPO).

38. (Previously presented) A method of controlling at least one weed in a field, wherein said field contains at least one plant of claim 30, wherein said method comprises applying to at least a portion of said field a first herbicide selected from the group consisting of a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

39. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is an achiral phenoxy auxin selected from the group consisting of 2,4-D and MCPA.

40. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin selected from the group consisting of triclopyr and fluroxypyr.

41. (Previously presented) The method of claim 38 wherein said method comprises applying a second herbicide.

42. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied sequentially.

43. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied concurrently.

44. (Previously presented) The method of claim 41 wherein said first herbicide is a phenoxy auxin and said second herbicide is a pyridyloxy auxin.

45. (Previously presented) The method of claim 41 wherein said second herbicide is selected from the group consisting of glyphosate, glufosinate, dicamba, acetolactate synthase inhibitors, protoporphyrinogen oxidase inhibitors, and hydroxyphenyl-pyruvate-dioxygenase inhibitors.

46. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glyphosate.

47. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glufosinate.

48. (Previously presented) The method of claim 41 wherein said plant further comprises a second herbicide resistance gene that renders said plant resistant to said second herbicide.

49. (Previously presented) The method of claim 48 wherein said second gene is selected from the group consisting of a modified AHAS (acetohydroxyacid synthase) gene, a glyphosate resistance gene, glufosinate resistance gene, and a gene encoding a dicamba-degrading enzyme.

50. (Previously presented) The method of claim 49 wherein:
(a) said modified AHAS (acetohydroxyacid synthase) gene is selected from the group consisting of a SurA, SurB, Csr1, Csr1-1, Csr1-2;
(b) said glyphosate resistance gene is selected from the group consisting of modified EPSPS (5-enolpyruvylshikimate-3-phosphate synthase), GOX, GAT; and, said glufosinate resistance gene is selected from the group consisting of phosphinothricin-N-acetyltransferase (PAT) and bar.

51. (Previously presented) The method of claim 41 wherein said method further comprises applying a third herbicide.

52. (Previously presented) The method of claim 51, wherein said third herbicide is selected from the group consisting of glyphosate, glufosinate, HPPD-inhibitors, PPO-inhibitors, ALS inhibitors, and dicamba.

53. (Previously presented) The method of claim 52 wherein said first, second and third herbicides are 2,4-D, quizalofop, and glyphosate.

54. (Previously presented) A seed comprising a plurality of the plant cell of claim 27.

55. (Previously presented) A method of controlling weeds in a field, wherein said method comprises applying a phenoxy auxin herbicide or a pyridyloxy auxin herbicide to said

field and planting a seed of claim 54 in said field within 14 days of applying said aryloxyalkanoate or pyridyloxy auxin herbicide.

56. (Canceled).

57. (Previously presented) A plant grown from the seed of claim 54 wherein said plant comprises said polynucleotide.

58. (Previously presented) A part, progeny, or asexual propagate of the plant of claim 57, wherein said part, progeny, or sexual propagate comprises said polynucleotide.

59. (Currently Amended) ~~An (R)-aryloxyphenoxypropionate herbicide tolerant~~ A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

$HX_{109}D(X)_{111-134}T(X)_{136-261}H(X)_{263-272}R$, wherein

X_{109} represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

$(X)_{111-134}$ represents a sequence of 24 amino acids;

$(X)_{136-261}$ represents a sequence of 126 amino acids; and

$(X)_{263-272}$ represents a sequence of 10 amino acids, wherein said AAD-12 motif has 90% sequence identity with corresponding amino acids of position 108 to 273 of SEQ ID NO: 2.

REMARKS

Amendments to the Claims

Applicant has amended the preamble of recently added claim 59 to be consistent with the preamble of co-pending claim 27. Claim 59 is distinguished from claim 27 in that claim 59 further requires the AAD-12 protein to comprise an amino acid sequence that is 90% identical to the 166 amino acid AAD-12 motif sequence of SEQ ID NO: 2 as represented by amino acids 108 to 273 of SEQ ID NO: 2. Exemplary support for claim 59 is found in numbered paragraphs [0023-24], [0045], [0053], [0061], [0065], and [00108].

Applicant respectfully requests that amended claim 59 as presented herein be considered along with the remarks provided in applicant's April 17, 2020 submission in response to the rejections raise in the final office action issued on December 20, 2019.

With the entry of the foregoing amendments, the application is believed to be in condition for allowance. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Respectfully submitted,

/John P. Breen/

John P. Breen
Attorney Reg. No. 38,833

JPB:gl
Indianapolis, Indiana 46204
317-261-7940



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867
107540	7590	07/24/2020		
Barnes & Thornburg LLP (Dow)				
11 South Meridian Street				
Indianapolis, IN 46204				
			EXAMINER	
			KRUSE, DAVID H	
			ART UNIT	PAPER NUMBER
			1663	
			NOTIFICATION DATE	DELIVERY MODE
			07/24/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

INDocket@btlaw.com

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 17 April 2020 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 27-55 and 57-59 remain rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant claims a transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein having at least 85% or 90% sequence identity with SEQ ID NO: 2 and an AAD-12 motif having the general formula of $\text{HX}_{109}\text{D}(\text{X})_{111}\text{-}_{134}\text{T}(\text{X})_{136-261}\text{H}(\text{X})_{263-272}\text{R}$. Applicant claims a transgenic plant comprising said plant cell and methods of using said transgenic plant.

Applicant describes an AAD-12 protein in instant SEQ ID NO: 2 and a single variant having an additional amino acid at position 2 in instant SEQ ID NO: 4.

Applicant does not describe the genus of AAD-12 proteins. The “AAD-12 motif” recited in the claims appears to be the specific motif in instant SEQ ID NO: 2 that represents the general motif found in α -ketoglutarate-dependent dioxygenases (paragraph 0053 on pages 12-13 of the instant Specification). Applicant does not describe a structural/functional relationship between the “AAD-12 motif” and enzymatically degrading a phenoxy auxin herbicide and a pyridyloxy auxin herbicide. In particular, Applicant does not describe what specific features (amino acids) in the “AAD-12 motif” are critical to the recited function.

Hence, it is unclear that Applicant was in possession of the invention as broadly claimed. See *University of Rochester v. G.D. Searle & Co.*, 68 USPQ2d 1424, 1433 (DC WNY 2003) which teaches knowing the “starting point” is not enough; that is little more than a research plan. The court held that the disclosure of screening assays and general classes of compounds was not adequate to describe compounds having the desired activity: without disclosure of which peptides, polynucleotides, or small organic molecules have the desired characteristic, the claims failed to meet the description requirement of § 112.

Applicant rebuts this rejection in the Remarks filed on 17 April 2020.

Applicant argues that there is an art-recognized structure-function correlation described in the arguments on pages 7-11 of the Remarks.

Applicant argues that Muller *et al* (2006 a disclosure that is postdated to Applicant's priority date of 28 October 2005) demonstrates that those skilled in the art are well familiar with the structure of α -ketoglutarate dependent dioxygenases. Applicant further argues that one skilled in the art appreciates that regions of conservation between homologous proteins suggests a structure/function role for such sequences (pages 11-12 of the Remarks).

Applicant argues that at the time of the invention a large amount of information was known regarding the structure/function of *tfdA* and related α -ketoglutarate-dependent dioxygenases. Applicant has used such information and further described a subset of α -ketoglutarate-dependent dioxygenases that retain the ability to enzymatically degrade phenoxy auxin herbicides and pyridyloxy auxin herbicides, due to the presence of the AAD-12 specific motif (page 13, 2nd paragraph of the Remarks).

Applicant argues that each peptide of the claimed genus is required to have at least 85% sequence identity with an amino acid of SEQ ID NO: 2. Applicant argues that applicant has provided guidance as to where modifications can be made in the AAD-12 sequence by requiring all peptides of the claimed genus to comprise the AAD-12 motif. Applicant argues that additional structure is also provided by the extensive analysis of homologous α KG dioxygenases provided in the published literature and alignments of the disclosed amino acids sequences. Applicant argues that those skilled in the art are well aware that proteins can be modified while retaining the activity of the original

protein, provided that the active site remains intact. Applicant argues that the claimed genus is further limited by the requirement that the claimed analogs of SEQ ID NO: 2 comprise the AAD-12 motif and retain enzymatic activity for degrading phenoxy auxin herbicides and pyridyloxy auxin herbicides (page 13, last paragraph of the Remarks).

Applicant argues that the skilled practitioner would know not to make modifications to amino acids that are conserved. Applicant argues that applicant's required functional limitations effectively add these structural elements to the claimed genus of proteins. Applicant argues that this information in combination with applicant's description of the AAD-12 motif (defining the key structural elements of the enzyme active site) as well as the requirement that claimed protein has at least 85% sequence identity with the protein of SEQ ID NO: 2 provides a detailed description of the structural elements of the claimed genus members (page 14, 3rd paragraph of the Remarks).

Applicant's arguments have been fully considered but are not found to be persuasive. Applicant's argument that there is a well-known structure/function relationship between the claimed "motif" and the claimed function is not found to be persuasive. The claimed motif represents the family of α -ketoglutarate dioxygenases which have a broad genus of substrates. Further, the Muller *et al* (2006) document submitted by Applicant shows that there are critical amino acids outside of the "AAD-12 motif" that are critical to the claimed function as illustrated in Figure 2 on page 1360, critical structure not described in the instant Application. Finally, Applicant has failed to describe a representative number of species that would represent the variation within the claimed genus. The rejection is maintained.

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 27-39, 41-54 and 57-58 remain and claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kaphammer (U.S. Patent 5,608,147) in view of Schleinitz *et al* (September 2004, Applied and Environmental Microbiology 70(9): 5357-5365) and Pallett *et al* (U.S. Patent 7,205,561 B1, § 371(c)(1) date of 15 June 1998). This rejection is repeated for the reason of record as set forth in the last Office action mailed 20 December 2019. Applicant's arguments filed 24 April 2020 have been fully considered but they are not persuasive.

Kaphammer teaches a plant cell comprising a polynucleotide that encodes a protein having aryloxyalkanoate dioxygenase activity, resistance to 2,4-dichlorophenoxyacetate (2,4-D) at claim 11, and a plant regenerated therefrom at claim 15. Kaphammer teaches an isolated polynucleotide that encodes a protein having aryloxyalkanoate dioxygenase activity at SEQ ID NO: 1. Kaphammer teaches transforming a soybean cell at Example 11, columns 21-22. Kaphammer teaches a method of controlling weeds by applying 2,4-D herbicide to a crop field at column 2, lines 26-28. Kaphammer teaches that a transgene that confers resistance to glyphosate can also be introduced into the plant cell (column 3, lines 11-6).

Kaphammer does not teach an isolated nucleic acid encoding instant SEQ ID NO: 2 or having the nucleotide sequence of instant SEQ ID NO: 1. Kaphammer does not teach introducing a polynucleotide that confers glufosinate resistance.

Schleinitz *et al* teach an isolated polynucleotide comprising instant SEQ ID NO: 1 at GenBank accession number AY327575 (page 5359, right column, 5th paragraph). The encoded protein (see FIG 2 on page 5360) would naturally have aryloxyalkanoate dioxygenase activity.

Pallett *et al* teach introducing polynucleotides to a transformed plant cell that renders said plant cell resistant to multiple herbicides including glyphosate (column 1, lines 62-64) and glufosinate (column 2, lines 27-29).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the teachings of Kaphammer to introduce a polynucleotide encoding instant SEQ ID NO: 2 as taught by Schleinitz *et al* in addition to a polynucleotide encoding resistance to glyphosate and glufosinate as suggested Pallett *et al*. Given the success of Pallett *et al*, and Kaphammer one of ordinary skill in the art would have had a reasonable expectation of success. Given dichlorprop was a known herbicide as taught by Schleinitz *et al* (page 5357, left column, 1st paragraph), one of ordinary skill in the art would have been motivated to introduce said polynucleotide encoding instant SEQ ID NO: 2 into a plant cell. Application of herbicides concurrently or sequentially would have been obvious to one of ordinary skill in the art at the time of Applicants' invention as such applications would have been a design choice in the instant art (instant claims 42 and 43). Instant claim 28 had been amended to recite that the AAD-12 differs from the amino acid sequence of SEQ ID NO: 2 by one or more

conservative amino acid substitutions, but this limitation would have been obvious in view of the teachings of Kaphammer who teaches that the *tdfA* gene can be altered by substitutions, additions or deletions that provide for functionally equivalent molecules at column 5, line 66 to column 6, line 39.

Applicant argues that the Examiner fails to provide any rationale for why one of ordinary skill would specifically select a gene encoding a peptide of SEQ ID NO: 2, or a derivative thereof having at least 85% sequence identity to a peptide of SEQ ID NO: 2, to substitute for the gene disclosed in Kaphammer. Applicant argues that there are many other known sequences that share sequence identity with the *tdfA* gene and can serve as possible candidates for providing aryloxyalkanoate dioxygenase activity. Applicant argues that at the time of applicant's invention it cannot be reasonably said that one would have turned to the specific gene disclosed in Schleinitz with the expectation that it would be expressed in plants, particularly to convey herbicide tolerance to the plants (page 15, 4th paragraph of the Remarks).

Applicant argues that at the time of the invention there was simply no motivation to select a bacterial gene having specific sequence of SEQ ID NO: 2 (page 15, last paragraph of the Remarks).

Applicant argues that "proceeding contrary to the accepted wisdom" (i.e., selecting low sequence identity homologs to test) is an indicia of nonobviousness. Applicant argues that applicant discovered that cloning and recombinantly expressing homologues with as little as 31% amino acid conservation can be used to impart commercial levels of resistance not only to the intended herbicide, but also to substrates never previously tested with these enzymes (page 16, 2nd paragraph of the Remarks).

Applicant argues that the subject AAD-12 enzyme was only 1 of over 100 BLAST search results having some degree of identity with *tfdA*. Applicant argues that there were great numbers of other possible choices that could have been selected and would have logically been more likely to provide phenoxy auxin tolerance when expressed in a plant (page 16, 3rd paragraph of the Remarks).

Applicant argues that the subject invention offers surprising advantages that none of the cited prior art references taught (page 16, 4th paragraph of the Remarks).

Applicant argues that it is not seen how the secondary references of Schleinitz or Pallett would support the reasonable expectation of success to produce a plant that is resistant to pyridyloxyacetates herbicides and thus protect a crop plant from damage by pyridyloxyacetates herbicide such as triclopyr and fluroxypyr or why a skilled practitioner would select a gene having low sequence identity to *tfdA* for testing. Applicant argues that there was no reason to select the nucleic acid of SEQ ID NO: 1, or derivative thereof, to be operably linked to a plant specific promoter, as there was no reasonable expectation that such a construct would produce the desired effect when transfected into plant cells (page 17, 1st paragraph of the Remarks).

Applicant argues that due to the unpredictability of the activity of bacterial genes in plant systems, contrary to the Examiner's assertions, there was no reasonable expectation of success based on the combined teachings of Kaphammer and Schleinitz that a plant transformed with the *rdpA* gene would produce a plant having tolerance to a phenoxy auxin herbicide, nor was there any rationale for selectively choosing the *sdpA* gene from the many other *tfdA*-like bacterial genes for combination with a plant promoter (page 17, 3rd paragraph of the Remarks).

Applicant argues that the subject *sdpA* gene was only 1 of over 100 BLAST search results having some degree of identity with *tfdA*. Applicant argues that the Examiner has failed to provide any rationale for specifically selecting the *sdpA* gene from the other 100 candidates other than rely on an improper obvious to try standard requiring one to "try each of numerous possible choices until one possibly arrived at a successful result". Applicant argues that even such efforts would not be likely to identify the present invention as many of the 100 BLAST search results could potentially produce a plant that exhibits the minimal phenoxy auxin herbicide tolerance (cited by the Examiner as motivation for substituting the *tfdA* gene with the *sdpA* gene) without revealing a protein having the activity of enzymatically degrading a phenoxy auxin herbicide and a pyridyloxy auxin herbicide as required by the claims (page 18, 2nd paragraph of the Remarks).

Applicant's arguments have been fully considered but are not found to be persuasive. Schleinitz *et al* had taught that the *sdpA* gene product metabolized the phenoxy auxin herbicide 2(2,4-Dichlorophenoxy)propionate (aka dichlorprop) in Figure 1 on page 5358 to the non-herbicidal compound 2,4-dichlorophenol just as the *tfdA* gene product metabolizes 2,4-dichlorophenoxyacetate to the non-herbicidal compound 2,4-dichlorophenol. In response to applicant's argument that the cited prior art did not recognize that the *sdpA* gene could produce tolerance to pyridyloxy auxin herbicides in a transgenic plant, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability **when the differences would otherwise be obvious**. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

As for Applicant's assertion of unexpected results, what would have been considered unexpected would have been a non-obvious use of an obvious product, that being use of pyridyloxy auxin herbicides on a plant transformed with the *sdpA* gene (instant SEQ ID NO: 2) to control weeds, but it is the Examiner's opinion that the use of said obvious product using a phenoxy auxin herbicide such as dichlorprop would have been obvious to one of ordinary skill in the art at the time of Applicants' invention. Schleinitz *et al* only teaches 11 group II α KG-dependent dioxygenases, thus it would not have required undue experimentation for one of ordinary skill in the art to modify the teachings of Kaphammer to try each of them, it would have only required routine experimentation.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based e-Terminal Disclaimer may be filled out completely online using web-screens. An e-Terminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about e-Terminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

7. Claims 27-55 and 57-59 rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,916,752. Although the claims at issue are not identical, they are not patentably distinct from each other because the subgenus claimed in the '752 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s)

will be filed to overcome the rejection upon a finding of allowable subject matter (page 18 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

8. Claims 27-55 and 57-59 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 8,283,522.

Although the claims at issue are not identical, they are not patentably distinct from each other because the subgenus claimed in the '522 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 18 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

9. Claims 27-55 and 57-59 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-6, 11-15 and 19-24 of U.S. Patent No. 9,944,944. Although the claims at issue are not identical, they are not patentably distinct from each other because the species claimed in the '944 Patent renders obvious the instantly claimed genus as the instant claims include soybean cells at instant claim 29. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 18 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

10. Claims 27-55 and 57-59 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-25 of U.S. Patent No. 10,167,483.

Although the claims at issue are not identical, they are not patentably distinct from each

other because the instantly claimed transgenic plant cell would have been obvious over the expression cassette of claim 1 of the '483 Patent and the claimed methods herein overlap in scope with those of the '483 Patent.

Conclusion

11. No claims are allowed.
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799 and direct fax number (571) 273-0799. The examiner can normally be reached on Monday to Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amjad Abraham can be reached at (571) 270-7058. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/
Primary Examiner, Art Unit 1663

Notice of References Cited	Application/Control No. 15/468,494		Applicant(s)/Patent Under Reexamination WRIGHT et al.	
	Examiner DAVID H KRUSE		Art Unit 1663	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-10167483-B2	01-2019	Wright; Terry R.	C12N9/0069	1/1
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					


FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

CPC - Searched*		
Symbol	Date	Examiner
C12N 9/0071	04/16/2019	/DK/

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor Name Search	04/16/2019	/DK/
EAST: USPAT, USPGPUB, EPO, JPO, DERWENT	04/16/2019	/DK/
STN: AGRICOLA, BIOSIS, CAPLUS, EMBASE, CABA	04/16/2019	/DK/
Sequence Search SEQ ID NO: 2	02/01/2019	/DK/
Update EAST	12/16/2019	/DK/
Update EAST	07/17/2020	/DK/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

SHEET 1 of 1

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
INFORMATION DISCLOSURE STATEMENT	Applicant(s) Terry Wright et al.	
	Filing Date March 24, 2017	Art Unit 1663

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.H.K./

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Document Number	Publication Date	Country	Translation Yes No	

OTHER DOCUMENTS	
	Müller et al, Protein Science (2006), 15:1356-1368
	Hotopp et al, Biochemistry 2002, 41, 9787-9794

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 07/17/2020
---------------------------	-----------------------------

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	56	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
L2	21	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
S1	7	((("8283522") or ("9944944") or ("8916751") or ("8685677") or ("9232803") or ("8916752") or ("10167483")).PN.	USPAT; USOCR	OR	OFF	2019/04/16 13:07
S2	0	"AAD-12.clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S3	0	"AAD-12""'.clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S4	663	AAD-12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S5	50	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S6	52	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/16 09:34
S7	1	("7205561").PN.	USPAT; USOCR	OR	OFF	2019/12/17 15:03
S8	507	Pallett.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06
S9	16	S8 and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06

S10	0	Kaphammer.in. and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08
S11	19	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08

7/17/2020 9:20:59 AM

C:\Users\dkruse\Documents\EAST\Workspaces\15468494.wsp

Electronic Patent Application Fee Transmittal

Application Number:	15468494			
Filing Date:	24-Mar-2017			
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES			
First Named Inventor/Applicant Name:	Terry R. WRIGHT			
Filer:	John P. Breen/Priscilla York			
Attorney Docket Number:	14764-262737			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	1253	1	1480	1480
Miscellaneous:				
Total in USD (\$)				1480

Electronic Acknowledgement Receipt

EFS ID:	41701223
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen/Priscilla York
Filer Authorized By:	John P. Breen
Attorney Docket Number:	14764-262737
Receipt Date:	21-JAN-2021
Filing Date:	24-MAR-2017
Time Stamp:	13:28:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1480
RAM confirmation Number	E20211KD29304841
Deposit Account	100435
Authorized User	Priscilla York

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.21 (Miscellaneous fees and charges)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.17 (Patent application and reexamination processing fees)
37 CFR 1.16 (National application filing, search, and examination fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	Response_to_7-24-20_OA.pdf	117758	no	16
			a98bb5461d322ea869c9cb816c9a22336e305b73		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	31190	no	2
			45ce406a5c6bb7507191f7104508af085fbafe		

Warnings:

Information:

Total Files Size (in bytes):	148948
-------------------------------------	--------

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Customer No.	107540	}	
		}	
Group:	1663	}	
		}	
Confirmation No.:	6867	}	
		}	
Application No.:	15/468,494	}	
		}	
Invention:	NOVEL HERBICIDE RESISTANCE GENES	}	<u>ELECTRONICALLY FILED ON:</u>
		}	
Inventor:	Wright et al.	}	<u>January 21, 2021</u>
		}	
Filed:	March 24, 2017	}	
		}	
Attorney Docket:	14764-262737	}	
		}	
Examiner:	David Kruse	}	

AMENDMENT AND RESPONSE UNDER 37 CFR 1.111

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In response to the Office Action mailed July 24, 2020, Applicant requests consideration of the accompanying remarks and submits herewith a petition for a three-month extension of time. Applicant has submitted payment of the \$1,480.00 fee under 37 CFR § 1.17(a) for the requested three-month extension of time, and hereby authorizes the Commissioner to charge any additional fee necessary to effect this filing, to the account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to our file 14764-262737.

Amendments to the claims are submitted herewith beginning on page 2.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-26 (Canceled).

27. (Previously presented) A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R, wherein

X₁₀₉ represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

(X)₁₁₁₋₁₃₄ represents a sequence of 24 amino acids;

(X)₁₃₆₋₂₆₁ represents a sequence of 126 amino acids; and

(X)₂₆₃₋₂₇₂ represents a sequence of 10 amino acids.

28. (Currently Amended) The plant cell of claim 27 wherein the AAD-12 protein comprises an amino acid sequence having at least 90% sequence identity with SEQ ID NO: 2 ~~wherein the AAD-12 differs from the amino acid sequence of SEQ ID NO: 2 by one or more conservative amino acid substitutions.~~

29. (Previously presented) The plant cell of claim 27 wherein said plant cell is dicotyledonous and selected from the group consisting of a cotton cell, a tobacco cell, a canola cell, a soybean cell, and an Arabidopsis cell.

30. (Currently amended) A transgenic plant comprising a plurality of the plant ~~cell~~cells of claim 27, wherein expression of said polynucleotide renders said plant tolerant to an

aryloxyalkanoate herbicide.

31. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a phenoxy auxin herbicide.

32. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of 2,4-dichlorophenoxyacetic acid, and MCPA.

33. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin.

34. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of triclopyr and fluroxypyr.

35. (Previously presented) The plant of claim 30 wherein expression of said polynucleotide renders said plant resistant to both a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

36. (Previously presented) The plant of claim 30 wherein said plant further comprises a second herbicide resistance gene.

37. (Previously presented) The plant of claim 36 wherein said second herbicide resistance gene renders said plant resistant to an herbicide selected from the group consisting of glyphosate, glufosinate, ALS inhibitors, inhibitors of 4-hydroxyphenyl-pyruvate-dioxygenase (HPPD), dicamba and inhibitors of protoporphyrinogen oxidase (PPO).

38. (Previously presented) A method of controlling at least one weed in a field, wherein said field contains at least one plant of claim 30, wherein said method comprises applying to at least a portion of said field a first herbicide selected from the group consisting of a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

39. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is an achiral phenoxy auxin selected from the group consisting of 2,4-D and MCPA.

40. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin selected from the group consisting of triclopyr and fluroxypyr.

41. (Previously presented) The method of claim 38 wherein said method comprises applying a second herbicide.

42. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied sequentially.

43. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied concurrently.

44. (Previously presented) The method of claim 41 wherein said first herbicide is a phenoxy auxin and said second herbicide is a pyridyloxy auxin.

45. (Previously presented) The method of claim 41 wherein said second herbicide is selected from the group consisting of glyphosate, glufosinate, dicamba, acetolactate synthase inhibitors, protoporphyrinogen oxidase inhibitors, and hydroxyphenyl-pyruvate-dioxygenase inhibitors.

46. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glyphosate.

47. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glufosinate.

48. (Previously presented) The method of claim 41 wherein said plant further comprises a second herbicide resistance gene that renders said plant resistant to said second herbicide.

49. (Currently amended) The method of claim 48 wherein said second herbicide resistance gene is selected from the group consisting of a modified AHAS (acetohydroxyacid synthase) gene, a glyphosate resistance gene, glufosinate resistance gene, and a gene encoding a dicamba-degrading enzyme.

50. (Currently Amended) The method of claim 49 wherein:

- (a) said modified AHAS (acetohydroxyacid synthase) gene is selected from the group consisting of [[a]] SurA, SurB, Csr1, Csr1-1, and Csr1-2;
- (b) said glyphosate resistance gene is selected from the group consisting of modified EPSPS (5-enolpyruvylshikimate-3-phosphate synthase), GOX, and GAT; and, said glufosinate resistance gene is selected from the group consisting of phosphinothricin-N-acetyltransferase (PAT) and bar.

51. (Previously presented) The method of claim 41 wherein said method further comprises applying a third herbicide.

52. (Previously presented) The method of claim 51, wherein said third herbicide is selected from the group consisting of glyphosate, glufosinate, HPPD-inhibitors, PPO-inhibitors, ALS inhibitors, and dicamba.

53. (Previously presented) The method of claim 52 wherein said first, second and third herbicides are 2,4-D, quizalofop, and glyphosate.

54. (Currently amended) A seed comprising a plurality of the plant ~~cell~~cells of claim 27.

55. (Previously presented) A method of controlling weeds in a field, wherein said

method comprises applying a phenoxy auxin herbicide or a pyridyloxy auxin herbicide to said field and planting a seed of claim 54 in said field within 14 days of applying said aryloxyalkanoate or pyridyloxy auxin herbicide.

56. (Canceled).

57. (Previously presented) A plant grown from the seed of claim 54 wherein said plant comprises said polynucleotide.

58. (Previously presented) A part, progeny, or asexual propagate of the plant of claim 57, wherein said part, progeny, or sexual propagate comprises said polynucleotide.

59. (Previously presented) A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

$\text{HX}_{109}\text{D}(\text{X})_{111-134}\text{T}(\text{X})_{136-261}\text{H}(\text{X})_{263-272}\text{R}$, wherein

X_{109} represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

$(\text{X})_{111-134}$ represents a sequence of 24 amino acids;

$(\text{X})_{136-261}$ represents a sequence of 126 amino acids; and

$(\text{X})_{263-272}$ represents a sequence of 10 amino acids, wherein said AAD-12 motif has 90% sequence identity with corresponding amino acids of position 108 to 273 of SEQ ID NO: 2.

REMARKS

Amendments to the Claims

Applicant has amended claim 28 to clarify the scope of the claim and claim 50 has been amended to conform to the Markush format using the conjunction “and” between the penultimate and final listed elements. Claims 30 and 54 have been amended to correct prepositional phrases, and Claim 49 has been amended to clarify antecedent basis. No new matter is added by way of these amendments.

Claim Rejections

Double Patenting Rejections

Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-20 of US Patent No 8,916,752. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-14 of US Patent No 8,283,522. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-6, 11-15 and 19-24 of US Patent no 9,944,944. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-25 of US Patent no 10,167,483. Applicant will file the necessary terminal disclaimers to overcome these rejections upon a finding of allowable subject matter.

The Written Description Rejection Should Be Withdrawn

Claims 27-55 and 57-59 stand rejected under 35 USC 112, first paragraph for failing to comply with the written description requirement. Applicant respectfully traverses this rejection, as the Examiner has not met his burden of establishing applicant's failure to comply with the written description requirement of 35 USC 112.

As set forth below, under a proper common-structure analysis, the specification adequately describes the claimed structural motif such that as of the filing date a skilled artisan would have recognized that the inventors were in possession of the claimed subgenus.

Traversal of Examiner's Assertion that Applicant Failed to Establish Features of AAD-12 Motif

The Examiner contends that “Applicant does not describe what specific features (amino acids) in the ‘AAD-12 motif’ are critical to the recited function.” Applicants respectfully traverse and note that the pending claims include the following features: (i) 85% sequence

identity to SEQ ID NO: 2, (ii) designation of specific amino acid residues as well as (iii) the designated spacing indicated by the motif and (iv) a specific function - aryloxyalkanoate dioxygenase activity. The structural features of the claims are relevant elements to the recited function and establish a clear structure function relationship for the claimed activity.

As noted by the Examiner, the specification of the current application and the US priority applications each disclose a general α -ketoglutarate-dependent dioxygenase motif, as described on page 12, paragraph [0053] of the present application. The motif described in paragraph [0053] discloses an amino acid sequence comprising a tripeptide of HX(D/E) separated by 23 to 26 amino acids from a (T/S) residue which is separated by 114 to 183 amino acids from a histidine residue which is separated by 10 to 13 amino acids from an arginine residue (i.e., HX(D/E)X₂₃₋₂₆(T/S) X₁₁₄₋₁₈₃HX₁₀₋₁₃R).

The present claims are directed to enzymes and genes that have the unique ability to degrade 2,4-D (and other phenoxyalkanoic (phenoxy) auxin herbicides) as well as a distinctly different auxin chemical class, the pyridyloxy auxin herbicides, and the use of such enzymes to render plants resistant to 2,4-D and pyridyloxy auxin herbicides.

Applicant has described the complete amino acid sequence of AryloxyAlkanoate Dioxygenase (AAD-12) proteins (SEQ ID NOs: 2 and 4) that have been found to exhibit activity in degrading 2,4-D as well as pyridyloxy auxin herbicides. Applicant further recognized at the time of the invention that variant peptides of these exemplified species could be prepared that retain the desired activity. In particular, the specification describes at [0108]: "Certain proteins of the subject invention have been specifically exemplified herein. As these proteins are merely exemplary of the proteins of the subject invention, it should be readily apparent that the subject invention comprises variant or equivalent proteins (and nucleotide sequences coding for equivalents thereof) having same or similar activity of the exemplified proteins." Furthermore, those skilled in the art appreciate that biologically active variants of known proteins can be prepared provided the active site remains intact.

In analyzing the structure of the identified AAD-12 proteins in light of the known α -ketoglutarate-dependent dioxygenase motif, applicant has derived a specific "AAD-12 motif", wherein the first histidine residue of the α -ketoglutarate-dependent dioxygenase motif corresponds to the histidine found at position 108 of SEQ ID NO:2, the (D/E) residue of the α -ketoglutarate-dependent dioxygenase motif corresponds to the aspartate residue at position 110 of SEQ ID NO:2, the (T/S) residue of the α -ketoglutarate-dependent dioxygenase motif corresponds to the threonine residue at position 135 of SEQ ID NO:2, the second histidine residue of the α -ketoglutarate-

dependent dioxygenase motif corresponds to the histidine residue at position 262 of SEQ ID NO:2, and the arginine residue of the α -ketoglutarate-dependent dioxygenase motif corresponds to the arginine residue at position 273 of SEQ ID NO:2, thus generating the AAD-12 motif of: HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R.

The original specification of priority document PCT/US2006/042133 as filed on October 27, 2006 provides two species of the claimed genus of peptides that exhibit the recited functionality of having aryloxyalkanoate dioxygenase activity, wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide. Additionally, the original specification highlights the amino acid residues of aryloxyalkanoate dioxygenases by providing the structure of a motif comprising the active site of the enzyme. One of ordinary skill in the art would know that the motif described on page 12, paragraph [0053] provides a roadmap to readily identify the corresponding positions in the AAD-12 proteins of SEQ ID NOs 2 and 4 to generate a "AAD-12 motif" of HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R, that is specific to the claimed genus of AAD-12 proteins. Moreover, the claims are directed to AAD-12 proteins that enzymatically degrade a phenoxy auxin herbicide and a pyridyloxy auxin herbicide by requiring the claimed peptides to comprise the functional element of the AAD-12 motif.

As disclosed at paragraph [0055], the disclosure relates to the identification and use of genes encoding an AAD-12 type enzyme capable of degrading phenoxy auxin and pyridyloxy auxin herbicides. The specification describes how one skilled in the art would readily recognize proteins (and genes) as claimed and their use as herbicide resistance proteins (See paragraphs [0061]-[0063]). Variant proteins (or equivalent proteins) of the subject invention are described as having amino acid substitutions as long as the proteins retain the desired biological/functional relationship. (See paragraphs [0098], [0100] and [0104]).

In support of the objective teachings relating to the structure/function relationship of the claimed AAD-12 genes, applicant notes that the use of the aryloxyalkanoate dioxygenase motif provided on page 12, paragraph [0053] to define the structure the active site of a specific AAD protein, such as AAD-12, has been validated for other structurally similar enzymes. Accordingly, there is no reason to doubt the objective teaching of the structure/function associated with the AAD-12 motif as described in the present invention.

The Examiner Incorrectly Analogizes to Representative-Species Cases

To support a genus or sub-genus claim, a patent specification may disclose “either a representative number of species falling within the scope of the claims or structural features common to the members of the genus.” *Ajinomoto Co., Inc. v. International Trade Commission*, 932 F.3d 1342, 1358-59 (2019) (quoting *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1350 (Fed. Cir. 2010) (en banc)). In the Office Action, the Examiner incorrectly relies on representative-species cases to reject the claims, overlooking the common structure disclosed in Applicant’s specification and expressly recited in Applicant’s claims.

The Office Action fails to distinguish or address Applicant’s reliance on *Ajinomoto*, in which the Federal Circuit held that common structural features supported claims to a genus. There the court made reference to known consensus sequences that provided structure to the claimed functional limitation, analogous to Applicant’s claimed AAD-12 motif, and found that this in combination with the background knowledge of a skilled artisan conferred adequate written description support. *Ajinomoto*, 932 F.3d at 1359-60. In particular, the ITC concluded that a skilled artisan would have recognized that promoters having fewer departures from a “consensus sequence in a promoter” were “generally stronger than promoters with more departures from such a sequence,” and the Federal Circuit affirmed. *Id.* Rejecting arguments for a heightened written-description standard involving common structure, the *Ajinomoto* Court emphasized that the law “does not require a perfect correspondence between the members of the genus and the asserted common structural feature.” *Id.* Instead, the Court has “spoken more modestly of a ‘correlation between structure and function.’” (citation omitted) (emphasis in original)).

Here, as detailed below, *Ajinomoto* is closely analogous and supports withdrawal of the written-description rejection.

The Specification Discloses Common Structure Supporting Applicant’s Subgenus Claims

Applicant’s specification describes the common structure of the catalytic core of α -ketoglutarate-dependent dioxygenases. Indeed, as noted earlier, the specification describes the structural motif HX(D/E)X₂₃₋₂₆(T/S)X₁₁₄₋₁₈₃HX₁₀₋₁₃R that characterizes the α -ketoglutarate-dependent dioxygenase family. Specification at ¶ [0053]. The specification further discloses that

this motif “comprises the active site” of the claimed dioxygenases, as the histidine residues “coordinate [the] Fe²⁺ ion in the active site that is essential for catalytic activity.” Specification at ¶ [0053].

The art also recognized the common structure and importance of the general structural motif as the active site for α -ketoglutarate-dependent dioxygenases, including for the “Group II” subfamily encompassing TfdA and AAD, *inter alia*. See, e.g., Hogan et al., *J Biol Chem*, 2000; 275(17): 12400-12409 at Table 1. Hogan, which is cited in the specification at paragraph [0053], describes the general motif of α -ketoglutarate-dependent dioxygenases and shows the importance of residues within that motif for the catalytic activity of TfdA via site-directed mutagenesis studies. See, e.g., Hogan at 12406 (disclosing that site-directed mutagenesis studies “support the proposal that the residues in the HX(D/E) motif are ligands to the metal I TfdA and, most likely, other Group II enzymes”). Hogan initially identified His-113, Asp-115, and His-262, deemed a “consensus sequence,” as active site residues for TfdA. *Id.* By 2002, the same research group then identified two more residues, Thr-141 and Arg-274, as also part of the active site. See Hotopp et al., *Biochem.* 41:9787-9794, (2002). These five residues correspond to Applicant’s disclosed general structural motif for the common catalytic core: **HX(D/E)X₂₃₋₂₆(T/S)X₁₁₄₋₁₈₃HX₁₀₋₁₃R**. see *Ajinomoto*, 932 F.3d at 1359-60 (finding adequate written description based on a known promoter “consensus sequence” and other supporting background knowledge in the art).

The specification further describes, as the active site, the specific AAD-12 motif recited in the claims: “HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R”. Indeed, the specification discloses (1) the sequence of AAD-12 (SEQ ID NO: 2), which has the conserved α -ketoglutarate-dependent dioxygenase center motif (i.e., structure), (2) the classification of AAD-12 within the same family as TfdA, (3) the conserved catalytic center across this subfamily of dioxygenases, and (4) the additional sequences of AAD-12 variants sharing the common motif and common properties. Specification at ¶ [0053]; see also *id.* at SEQ ID NOs: 2 and 4. The specification specifically discloses this active-site motif, which is identifiable in SEQ ID NOs: 2 and 4.

A skilled artisan would have recognized that the HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R motif in the AAD-12 sequence is the catalytic core in view of its relation to the disclosed “active site” motif in paragraph [0053] of the specification, as well as based on background knowledge in the art in which researchers had investigated and characterized other α -ketoglutarate-dependent dioxygenases. Hogan, for example, investigated TfdA, which is in the same family as

AAD (*see* Specification at ¶ [0053]), by comparing it to other enzymes in the family and showing the conservation of the common active-site structure. Hogan at Fig. 8. A skilled artisan would have readily identified the HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R motif in the AAD-12 sequence as the active site through similar sequence alignment.

The Office Action thus errs in requiring “actual sequence information” to satisfy the written-description requirement where Applicant’s specification clearly describes the common structural motif conferring the active site to the claimed dioxygenases—just as the art had previously recognized for other α -ketoglutarate-dependent dioxygenases within the same subfamily, *see* Hogan at abstract; *Ajinomoto*, 932 F.3d at 1358-59 (section 112 requires only common structure *or* a representative number of species). Because the claimed common structure of the HX₁₀₉D(X)₁₁₁₋₁₃₄T(X)₁₃₆₋₂₆₁H(X)₂₆₃₋₂₇₂R motif corresponds to the recognized active site of dioxygenases, a skilled artisan would have readily appreciated that the disclosed AAD-12 common structural motif confers the specific activity of the claimed dioxygenases, including the phenoxy auxin and pyridyloxy auxin degrading activity. *Ajinomoto*, 932 F.3d at 1359-60 (affirming adequate written description where “a skilled artisan could identify more [embodiments] given the well-known link between consensus sequence and [activity]” (internal quotation marks omitted)).

Furthermore, a skilled artisan would have appreciated that Applicant was in possession of the full scope encompassed by the current claims. The family of α -ketoglutarate dioxygenases were a well-studied class of enzymes by 2004. Many members of this class of proteins were fully sequenced, and those skilled in the art recognized that members of this class varied widely in their respective sequence identity to one another (ranging down to about 78-85% amino acid identity to the *Cupriavidus necator* TfdA among beta-and gamma-proteobacteria, to about 44-45% amino acid identity among alpha-proteobacteria) while retaining functional activity against phenoxy auxin herbicides (e.g. the ability to metabolize 2,4-D). Furthermore, the crystal structure of TauD (a member of the Group II sub-family) had been obtained, providing additional data on the structure of Group II α -KG dioxygenases, and this crystal structure had been used to make mutations in TfdA, another Group II family member. Accordingly, based on the general knowledge of the skilled practitioner at the time of filing the application, in combination with applicant's disclosed structure of the exemplified embodiments and the AAD-12 motif, one of ordinary skill would readily have been able to envision the structure of variants

that meet the limitations of the claimed invention and would thus understand that applicant was in possession of the invention as claimed.

Accordingly, Applicant respectfully requests withdrawal of the written-description rejection in view of the specification's specific disclosure of common structure, supported by the high level of background knowledge in the art. *Ajinomoto*, 932 F.3d at 1359-60.

The Obviousness Rejection Should Be Withdrawn

Claims 27-39, 41-54 and 57-58 stand rejected under 35 USC 103 as being obvious over the combined teachings of Kaphammer (US Patent 5,608,147) in view of Schleinitz et al (Applied and Environmental Microbiology 70(9): 5357-5365) and Pallett et al (US Patent 7,205,561). Kaphammer is cited as teaching plants that comprise a gene for conferring aryloxyalkanoate dioxygenase activity to those plants, and the use of such plants in methods of weed control using 2, 4-D. The Examiner admits that Kaphammer does not teach the AAD-12 protein (SEQ ID NO:2) or a nucleic acid sequence encoding such a protein. Schleinitz is cited as teaching the nucleic acid sequence of SEQ ID NO: 1 which encodes the protein of SEQ ID NO: 2. Pallett et al is cited for teaching transgenic plants that comprise various genes that confer herbicide tolerance to the plant.

The Examiner contends that it would have been *prima facie* obvious to substitute the gene of Schleinitz or Pallett for the gene disclosed in Kaphammer to generate the currently claimed plant. Applicants respectfully traverse this rejection.

The Office Action Fails to Establish Motivation to Combine

First of all, applicant respectfully submits that the Examiner fails to provide any rationale for why one of ordinary skill would specifically select a gene encoding a peptide of SEQ ID NO: 2, or a derivative thereof having at least 85% sequence identity to a peptide of SEQ ID NO: 2, to substitute for the gene disclosed in Kaphammer. Applicant notes there are many other known sequences that share sequence identity with the *tfdA* gene and can serve as possible candidates for providing aryloxyalkanoate dioxygenase activity. At the time of applicant's invention it cannot be reasonably said that one would have turned to the specific gene disclosed in Schleinitz with the expectation that it would be expressed in plants, particularly to convey herbicide tolerance to the plants.

At the time of the invention there was simply no motivation to select a bacterial gene having specific sequence of SEQ ID NO: 2 (or a peptide having at least 85% sequence identity with SEQ ID NO: 2) for combination with a heterologous promoter that is functional in a plant cell for use in producing transgenic plants that are tolerant to damage by an aryloxyalkanoate herbicide. For example, as the specification states, identifying the *sdpA* (AAD-12) enzyme required mining an extensive database that, even under default search options, provide more than 100 other genes as potential selections:

As a way to identify genes which possess herbicide degrading activities *in planta*, it is possible to mine current public databases such as NCBI (National Center for Biotechnology Information). To begin the process, it is necessary to have a functional gene sequence already identified that encodes a protein with the desired characteristics (i.e., α -ketoglutarate dioxygenase activity). This protein sequence is then used as the input for the BLAST (Basic Local Alignment Search Tool) (Altschul et al., 1997) algorithm to compare against available NCBI protein sequences deposited. Using default settings, this search returns upwards of 100 homologous protein sequences at varying levels of sequence identity. These range from highly identical (85-98%) to very low identity (23-32%) at the amino acid level. Traditionally, only sequences with high homology would be expected to retain similar properties to the input sequence. In this case applicant chose only those sequences with $\leq 50\%$ homology. Specification at ¶ [0156] (emphases added).

Proceeding contrary to the accepted wisdom (i.e., selecting low sequence identity homologs to test) is an indicia of nonobviousness. Surprisingly, applicant discovered that cloning and recombinantly expressing homologues with as little as 31% amino acid conservation can be used to impart commercial levels of resistance not only to the intended herbicide, but also to substrates never previously tested with these enzymes.

As discussed above, there were other possible choices. e.g., with a higher % identity to *tfdA* that would have been selected with the expectation that they would have been more likely to provide phenoxy auxin tolerance when expressed in a plant. Yet, applicant demonstrated to the contrary, that by selecting a lower % identity enzyme, applicant demonstrated a novel function.

None of the cited prior art references taught the characteristics as claimed. As illustrated by the subject specification, the data of Tables 9 & 10 demonstrates AAD-12 is able to degrade the pyridyloxyacetate auxins (e.g., triclopyr, fluroxypyr) in addition to achiral phenoxy auxins (e.g., 2,4-D, MCPA, 4-chlorophenoxyacetic acid). Previous to applicants' disclosure, there was

no expectation that such plants could effectively produce an AAD-12 enzyme to render the plants resistant to a phenoxyacetic acid herbicide (such as 2,4-D) and/or one or more pyridyloxyacetate herbicides such as triclopyr and fluroxypyr. Thus, the subject invention provides many advantages that were not heretofore thought to be possible in the art.

Thus, it is not seen how the secondary references of Schleinitz or Pallett would support the reasonable expectation of success to produce a plant that is resistant to pyridyloxyacetate herbicides, thus protecting a crop plant from damage by pyridyloxyacetate herbicides such as triclopyr and fluroxypyr, or why a skilled practitioner would select a gene having low sequence identity to *tdfA* for testing. Accordingly, there was no reason to select the nucleic acid of SEQ ID NO: 1, or a derivative thereof, to be operably linked to a plant specific promoter, as there was no reasonable expectation that such a construct would produce the desired effect when transfected into plant cells.

The Examiner has cited Schleinitz as teaching the nucleic acid sequence of SEQ ID NO: 1 which encodes the protein of SEQ ID NO: 2 and contends it was obvious to try to substitute this gene for the *tdfA* aryloxyalkanoate dioxygenase gene disclosed in Kaphammer. However, there is no teaching provided by any of the cited prior art to indicate that the *sdpA* bacterial gene would provide tolerance to phenoxy auxin herbicides upon introduction into plant cells. Due to the unpredictability of the activity of bacterial genes in plant systems, contrary to the Examiner's assertions, there was no reasonable expectation of success based on the combined teachings of Kaphammer and Schleinitz that a plant transformed with the *sdpA* gene would produce a plant having tolerance to a phenoxy auxin herbicide, nor was there any rationale for selectively choosing the *sdpA* gene from the many other *tdfA* -like bacterial genes for combination with a plant promoter.

The Federal Circuit has differentiated between proper and improper applications of "obvious to try" in *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir.). More particularly, two classes of improper obvious to try were exemplified as follows: (1) when what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful; and (2) when what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of

experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

The Examiner has failed to provide any rationale for specifically selecting the *sdpA* gene from the other 100 candidates other than rely on an improper obvious to try standard requiring one to "try each of numerous possible choices until one possibly arrived at a successful result". However, even such efforts would not be likely to come up with the invention as claimed. Many of the 100 BLAST search results could potentially produce a plant that exhibits the minimal phenoxy auxin herbicide tolerance (cited by the Examiner as motivation for substituting the *tfdA* gene with the *sdpA* gene) without revealing a protein having the activity of enzymatically degrading a phenoxy auxin herbicide and a pyridyloxy auxin herbicide as required by the claims. Accordingly, the combined teachings of the cited prior art fail to suggest or provide any guidance of how to obtain a gene and recombinant plant that has the functionality of the present claimed invention.

Applicant respectfully requests the withdrawal of the rejection of claims 27-39, 41-54 and 57-58 as being obvious over the combined teachings of Kaphammer in view of Schleinitz et al and Pallett et al.

With the entry of the foregoing amendments, the application is believed to be in condition for examination and allowance. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Respectfully submitted,

/John P. Breen/

John P. Breen
Attorney Reg. No. 38,833

JPB:gl
Indianapolis, Indiana 46204
317-261-7940

DMS 15088277v1

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/468,494		Filing Date 03/24/2017		<input type="checkbox"/> To be Mailed					
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO													
APPLICATION AS FILED - PART I													
		(Column 1)	(Column 2)										
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)						
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A								
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A								
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A								
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$80 =									
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$420 =									
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))													
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL								
APPLICATION AS AMENDED - PART II													
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT	01/21/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)						
	Total (37 CFR 1.16(i))	* 32	Minus	** 32	= 0	x \$100 =	0						
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	x \$480 =	0						
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE		0				
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)						
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =							
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =							
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.							LIE						
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".							/CHRISTINE V MOORE/						
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".													
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.													

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867
107540	7590	05/03/2021		
Barnes & Thornburg LLP (Dow)			EXAMINER	
11 South Meridian Street			KRUSE, DAVID H	
Indianapolis, IN 46204				
			ART UNIT	PAPER NUMBER
			1663	
			NOTIFICATION DATE	DELIVERY MODE
			05/03/2021	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

INDocket@btlaw.com

Status of the Application

1. This Office Action is in response to the Amendments and Remarks filed 21 January 2021.
2. The rejection under 35 U.S.C. 112(a) is withdrawn in view of Applicant's Remarks.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 30 and 54 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

At claims 30 and 54, the limitation "plant cells of claim 27" lacks proper antecedent basis in claim 27 because said limitation is not in number agreement with "A transgenic plant cell" recited in claim 27.

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 27-39, 41-54 and 57-59 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Kaphammer (U.S. Patent 5,608,147) in view of Schleinitz *et al* (September 2004, Applied and Environmental Microbiology 70(9): 5357-5365) and Pallett *et al* (U.S. Patent 7,205,561 B1, § 371(c)(1) date of 15 June 1998). This rejection is repeated for the reason of record as set forth in the last Office action mailed 24 July 2020. Applicant's arguments filed 21 January 2021 have been fully considered but they are not persuasive.

Kaphammer teaches a plant cell comprising a polynucleotide that encodes a protein having aryloxyalkanoate dioxygenase activity, resistance to 2,4-dichlorophenoxyacetate (2,4-D) at claim 11, and a plant regenerated therefrom at claim 15. Kaphammer teaches an isolated polynucleotide that encodes a protein having aryloxyalkanoate dioxygenase activity at SEQ ID NO: 1. Kaphammer teaches transforming a soybean cell at Example 11, columns 21-22. Kaphammer teaches a method of controlling weeds by applying 2,4-D herbicide to a crop field at column 2, lines 26-28. Kaphammer teaches that a transgene that confers resistance to glyphosate can also be introduced into the plant cell (column 3, lines 11-6).

Kaphammer does not teach an isolated nucleic acid encoding instant SEQ ID NO: 2 or having the nucleotide sequence of instant SEQ ID NO: 1. Kaphammer does not teach introducing a polynucleotide that confers glufosinate resistance.

Schleinitz *et al* teach an isolated polynucleotide comprising instant SEQ ID NO: 1 at GenBank accession number AY327575 (page 5359, right column, 5th paragraph). The encoded protein (see FIG 2 on page 5360) would naturally have aryloxyalkanoate dioxygenase activity.

Pallett *et al* teach introducing polynucleotides to a transformed plant cell that renders said plant cell resistant to multiple herbicides including glyphosate (column 1, lines 62-64) and glufosinate (column 2, lines 27-29).

It would have been *prima face* obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the teachings of Kaphammer to introduce a polynucleotide encoding instant SEQ ID NO: 2 as taught by Schleinitz *et al* in addition to a polynucleotide encoding resistance to glyphosate and glufosinate as suggested Pallett *et al*. At instant claim 38, Applicant recites the "first herbicide" to use in the claimed method in the alternative. Given the success of Pallett *et al*, and Kaphammer one of ordinary skill in the art would have had a reasonable expectation of success. Given dichlorprop was a known herbicide as taught by Schleinitz *et al* (page 5357, left column, 1st paragraph), one of ordinary skill in the art would have been motivated to introduce said polynucleotide encoding instant SEQ ID NO: 2 into a plant cell. Application of herbicides concurrently or sequentially would have been obvious to one of ordinary skill in the art at the time of Applicants' invention as such applications would have been a design choice in the instant art (instant claims 42 and 43). Instant claim 28 had been amended to recite that the AAD-12 differs from the amino acid sequence of SEQ ID NO: 2 by one or more conservative amino acid substitutions, but this limitation would have been obvious in view of the teachings of Kaphammer who teaches that the *tdfA* gene can be altered by substitutions, additions or deletions that provide for functionally equivalent molecules at column 5, line 66 to column 6, line 39.

Applicant argues that the Examiner fails to provide any rationale for why one of ordinary skill would specifically select a gene encoding a peptide of SEQ ID NO: 2, or a

derivative thereof having at least 85% sequence identity to a peptide of SEQ ID NO: 2, to substitute for the gene disclosed in Kaphammer. Applicant argues that there are many other known sequences that share sequence identity with the *tfdA* gene and can serve as possible candidates for providing aryloxyalkanoate dioxygenase activity. Applicant argues that at the time of applicant's invention it cannot be reasonably said that one would have turned to the specific gene disclosed in Schleinitz with the expectation that it would be expressed in plants, particularly to convey herbicide tolerance to the plants (page 13, 5th paragraph of the Remarks).

Applicant argues that at the time of the invention there was simply no motivation to select a bacterial gene having specific sequence of SEQ ID NO: 2 (page 14, 1st paragraph of the Remarks).

Applicant argues that contrary to the accepted wisdom (i.e., selecting low sequence identity homologs to test) is an indicia of nonobviousness. Applicant argues that discovery that cloning and recombinantly expressing homologues with as little as 31% amino acid conservation can be used to impart commercial levels of resistance not only to the intended herbicide, but also to substrates never previously tested with these enzymes (page 14, 2nd paragraph of the Remarks).

Applicant argues that none of the cited prior art references taught the characteristics as claimed. Applicant argues that as illustrated by the subject specification, the data of Tables 9 & 10 demonstrates AAD-12 is able to degrade the pyridyloxyacetate auxins (e.g., triclopyr, fluroxypyr) in addition to achiral phenoxy auxins (e.g., 2,4-D, MCPA, 4-chlorophenoxyacetic acid). Applicant argues that previous to applicants' disclosure, there was no expectation that such plants could effectively

produce an AAD-12 enzyme to render the plants resistant to a phenoxyacetic acid herbicide (such as 2,4-D) and/or one or more pyridyloxyacetate herbicides such as triclopyr and fluroxypyr. Applicant argues that the subject invention provides many advantages that were not heretofore thought to be possible in the art (paragraph spanning pages 14-15 of the Remarks).

Per Applicant's arguments on page 15, 4th paragraph of the Remarks: There is no apparent requirement for one of ordinary skill in the art to vary all parameters or try each of numerous possible choices, and the instant invention is NOT directed to a new technology as illustrated by the cited prior art.

Applicant's arguments are not found to be persuasive. The teachings of the prior art appears to be clear, if one of ordinary skill in the art identifies a gene that encodes a protein that enzymatically degrades a known herbicide (2,4-D for example) by a known process (oxidation) it would have been obvious to transform a plant with such a gene to try to make an herbicide tolerant plant thereby. In fact, this process would have been considered routine experimentation in the art at the time of Applicant's invention. Schleinitz *et al* had taught that a polypeptide having instant SEQ ID NO: 2 would catalyze cleavage of 2(2,4-Dichlorophenoxy)propionate which is a known herbicide (see Schleinitz *et al*, page 5357, left column, 2nd paragraph). The fact that applicant has recognized another advantage, that being tolerance to a pyridyloxy auxin herbicide, which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant argues that the Examiner has failed to provide any rationale for specifically selecting the *sdpA* gene from the other 100 candidates other than rely on an improper obvious to try standard requiring one to "try each of numerous possible choices until one possibly arrived at a successful result" (page 16, 2nd paragraph of the Remarks).

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, Schleinitz *et al* had recognized that not all bacteria that carry a *tfdA*-like gene would be able to degrade 2,4-D (a phenoxy auxin herbicide) on page 5357, right column, 1st paragraph, but that the SdpA gene product does degrade 2,4-D. Schleinitz *et al* teach that the primary sequence of SdpA most closely resembled that of TfdA on page 5363, left column, 2nd paragraph. It would have been obvious to one of ordinary skill in the instant art that the SdpA taught by Schleinitz *et al* would have represented a functional equivalent to the TfdA gene used by Kaphammer to make a herbicide tolerant transgenic plant cell.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper time-wise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based e-Terminal Disclaimer may be filled out completely online using web-screens. An e-Terminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about e-Terminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

1. Claims 27-55 and 57-59 remain rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,916,752.

Although the claims at issue are not identical, they are not patentably distinct from each other because the subgenus claimed in the '752 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 7 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

2. Claims 27-55 and 57-59 remain rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 8,283,522.

Although the claims at issue are not identical, they are not patentably distinct from each other because the subgenus claimed in the '522 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject

matter (page 7 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

3. Claims 27-55 and 57-59 remain rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-6, 11-15 and 19-24 of U.S. Patent No. 9,944,944. Although the claims at issue are not identical, they are not patentably distinct from each other because the species claimed in the '944 Patent renders obvious the instantly claimed genus as the instant claims include soybean cells at instant claim 29. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 7 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

4. Claims 27-55 and 57-59 remain rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-25 of U.S. Patent No. 10,167,483. Although the claims at issue are not identical, they are not patentably distinct from each other because the instantly claimed transgenic plant cell would have been obvious over the expression cassette of claim 1 of the '483 Patent and the claimed methods herein overlap in scope with those of the '483 Patent. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 7 of the Remarks). Because the Examiner does not find the claims otherwise allowable the rejection is maintained for the reasons of record.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


9. No claims are allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799 and direct fax number (571) 273-0799. The examiner can normally be reached on Monday to Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amjad Abraham can be reached at (571) 270-7058. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/
Primary Examiner, Art Unit 1663

Search Notes 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

CPC - Searched*		
Symbol	Date	Examiner
C12N 9/0071	04/16/2019	/DK/


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor Name Search	04/16/2019	/DK/
EAST: USPAT, USPGPUB, EPO, JPO, DERWENT	04/16/2019	/DK/
STN: AGRICOLA, BIOSIS, CAPLUS, EMBASE, CABA	04/16/2019	/DK/
Sequence Search SEQ ID NO: 2	02/01/2019	/DK/
Update EAST	12/16/2019	/DK/
Update EAST	07/17/2020	/DK/
Update EAST	04/27/2021	/DK/

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	63	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
L2	9,690	C12N9/0071.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
L3	120	L2 AND "aad-12"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:59
L4	4	((("10167483") or ("8916752") or ("8283522") or ("9944944")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:00
L5	3	((("9232803") or ("8685677") or ("8916751")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:10

EAST Search History (Interference)

<This search history is empty>

4/27/2021 10:12:25 AM

C:\Users\dkruse\Documents\EAST\Workspaces\15468494.wsp

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL **(Submitted Only via EFS-Web)**

Application Number	15/468,494	Filing Date	March 24, 2017	Docket Number (if applicable)	14764-262737	Art Unit	1663
First Named Inventor	Terry Wright			Examiner Name	David Kruse		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
 Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☒ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____.
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
 Deposit Account No 100435

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	/John P. Breen/	Date (YYYY-MM-DD)	2021-08-03
Name	John P Breen	Registration Number	38833

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15468494			
Filing Date:	24-Mar-2017			
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES			
First Named Inventor/Applicant Name:	Terry R. WRIGHT			
Filer:	John P. Breen			
Attorney Docket Number:	14764-262737			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	1	100	100
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	2000	2000
Total in USD (\$)				2100

Electronic Acknowledgement Receipt

EFS ID:	43412401
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	03-AUG-2021
Filing Date:	24-MAR-2017
Time Stamp:	12:35:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2100
RAM confirmation Number	E202183C36354922
Deposit Account	100435
Authorized User	John Breen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment Submitted/Entered with Filing of CPA/RCE	Response_Accompanying_RCE.pdf	94966	no	13
			c0af54d2f4206908b296bb8b28b9a8dee6840e4d		
Warnings:					
Information:					
2	Affidavit-traversing rejectns or objectns rule 132	Wright_Declaration.pdf	161282	no	5
			f2ff34877dd416b012e90bec29a36e30d56b633		
Warnings:					
Information:					
3	Request for Continued Examination (RCE)	RCE_Request1.pdf	481636	no	3
			039210498b633cc9fe6159f4380a35837f87e27d		
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	40255	no	2
			7090992592b929723b27dd2367465df6d5361153		
Warnings:					
Information:					
Total Files Size (in bytes):			778139		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313
(317) 231-7433 Fax

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Wright et al.

Serial No.: 15/468,494

Filed: March 24, 2017

For: Novel Herbicide Resistance Genes

Confirmation No.: 6867

Examiner: David H. Kruse

Group Art Unit: 1663

Attorney Docket No.: 14764-262737
(63979A-US-CNT[3])

DECLARATION UNDER 37 C.F.R. § 1.132 OF DR. TERRY R. WRIGHT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Terry R. Wright, declare:

1. I am currently a Distinguished Laureate at Corteva Agriscience (formerly Dow AgroSciences, LLC), in Indianapolis, Indiana. I am a citizen of the United States of America. I have 29 years of research experience in the fields of agronomy, pesticide

science, and plant biotechnology. I received two Bachelor of Science degrees (B.S.) in Crop and Soil Science and Agricultural Biochemistry from Michigan State University, a Master of Science (M.S.) degree in Crop Science/Weed Science from Washington State University, and a Doctorate of Philosophy (Ph.D.) from Michigan State University in Herbicide Physiology and Plant Biotechnology. I am a co-inventor on over 50 granted U.S. patents, and an author of 20 peer-reviewed scientific journal articles. My research has been in the areas of crop protection and trait discovery and development. I am an expert in the field of herbicide physiology and herbicide resistance, weed control, and trait discovery and development.

2. I am an inventor and am very familiar with the contents of the subject application, U.S. Patent Application No. 15/468,494 ("the '494 Application"). I am informed and believe that the claims currently pending in the '494 Application reflect those attached hereto as Appendix I. I have reviewed and understand those claims.
3. I understand that this Declaration will be filed in support of the patentability of the claims pending in the '494 application.
4. I understand that in the final Office Action of May 3, 2021 in the '494 Application, the U.S. Patent and Trademark Office has rejected claims 27-39, 41-54, and 57-59 of the '494 Application as being unpatentable over Kaphammer (U.S. Patent 5,608,147) in view of Schleinitz et al (September 2004, Applied and Environmental Microbiology 70(9): 5357-5365) and Pallett et al (U.S. Patent 7,205,561 B1, § 371 (c)(1) date of 15 June 1998). (Office Action at point 6).
5. I have been asked to comment on whether a person of ordinary skill in the art at the time of the invention in 2005 would have thought the transgenic plant cell, encompassed by the claims, or the use of a plant comprising such cells in a method to control weeds, was obvious in light of the prior art teachings.
6. Prior to 2005, the scientific community had recognized that the *TfdA* gene could be expressed in transgenic plants to impart 2,4-D resistance in dicot plants (e.g., cotton and tobacco) normally sensitive to 2,4-D (Streber *et al.*, 1989; Lyon *et al.*, 1989; Lyon *et al.*,

1993). Furthermore, a large number of *tfdA*-type genes that encode proteins capable of degrading 2,4-D had been identified from the environment and deposited into the Genbank database. However, although many α -ketoglutarate-dependent dioxygenases were known, no gene except *tfdA* had exhibited the ability to degrade phenoxy auxin herbicides when inserted into plant cells.

7. At the time of the invention, the standard practice used for identifying proteins exhibiting a similar functionality to a known protein was to screen for proteins having a high level of amino acid sequence identity with the known protein, and then test those selected proteins for activity. Accordingly, to identify *tfdA*-type genes that encode proteins capable of degrading 2,4-D when expressed in plants (similar to the activity of the *tfdA* gene), one would traditionally select a protein having high sequence identity with TfdA.
8. The *sdpA* gene from *Delftia acidivorans* (as disclosed in Westendorf et al., 2002, 2003 and Schleinitz et al) encodes an enzyme (SdpA) that is distantly related to TfdA. SdpA had previously been shown to degrade S-dichloroprop (Westendorf et al., 2002 and 2003) but also 2,4-D (albeit, relatively poorly) based on *in vitro* assays. More particularly, the Westendorf 2003 article (Acta Biotechnol 23:3 shows preference of S-dichloroprop over 2,4-D by >3-fold (see Table 3). Furthermore, Schleinitz et al (cited by the Examiner) states on page 5363 (first column, first full paragraph) that "SdpA shows greatest activity with the S enantiomers of mecoprop and dichloroprop but has some activity toward 2,4-D". However, the recited enzymatic activity of SdpA was limited to *in vitro* assays and SdpA was known to have low homology to TfdA (31% amino acid identity). At the time of the invention, SdpA had never been expressed in plants, nor was there any motivation to do so.
9. Those skilled in the art appreciate that there is a high level of unpredictability associated with expressing bacterial genes in plant systems. This fact is highlighted by comparing the activity of two *tfdA* homologs expressed in plants. Appendix II provides data originally presented in Example 17.1-17.5 of US Patent no 7,838,733 comparing the activity of two α -KG dioxygenase enzymes referred to as AAD-1 and AAD-2.

10. AAD-2 is more closely related (about 44%) at the sequence level to *tfdA* than is AAD-1 (about 27%). Furthermore, AAD-2 was determined to have V_{\max} almost 8-fold higher than AAD-1 for 2,4-D, based on a standard *in vitro* assay. However, while, AAD-2 has a higher percentage sequence identity with *tfdA* relative to AAD-1, and in spite of AAD-2 having significantly higher *in vitro* activity for degrading 2,4-D, AAD-2 was surprisingly inactive when expressed in plants, while AAD-1 was very active.
11. In my opinion, one of ordinary skill in the art, being cognizant of the unpredictability associated with expressing bacterial genes in plant systems, would not have been motivated to specifically select a bacterial gene having low sequence identity to *tfdA* when attempting to express another gene that would provide tolerance to a phenoxy auxin herbicide. At the time of the invention there were over 100 other known *tfdA* homologs that share higher sequence identity with the *tfdA* gene than *sdpA*. Each of these homologs represent a gene that one could consider as a possible candidate for providing aryloxyalkanoate dioxygenase activity. Typically, one looking for a substitute gene would select a homolog having the highest sequence identity to the gene to be replaced, and selecting a gene having low sequence identity relative to the gene to be replaced, when other genes having higher sequence identity were available, would be acting contrary to conventional wisdom, in my opinion.
12. Although *SdpA* (AAD-12) had been identified at the time of the present invention as being capable of catalyzing a reaction analogous to that of *TfdA*, no examination of other herbicidal substrates of *SdpA* outside of the phenoxy auxin class were reported before the present invention. As a result of the present invention, it was discovered that *SdpA* render the plants resistant to one or more pyridyloxyacetate herbicides such as triclopyr and fluroxypyr. At the time of invention, no other α -KG dioxygenase enzymes had been reported to render the plants resistant to a phenoxyacetic acid herbicide (such as 2,4-D) and one or more pyridyloxyacetate herbicides such as triclopyr and fluroxypyr.
13. For the above reasons, it is evident to me, as one skilled in the art, that the combined teachings of Kaphammer in view of Schleinitz et al. and Pallett et al. fail to suggest or

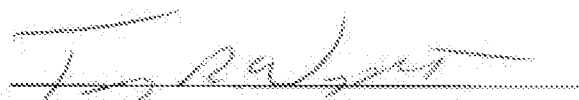
provide any guidance of how to obtain a gene and recombinant plant that has the functionality of the present claimed invention.

14. I hereby declare that all statements made herein are true and that they are based on my own knowledge, information and belief.

Place and Date: 7/29/2021

By:

Indianapolis, Indiana



Terry R. Wright

Distinguished Laureate

Corteva Agriscience

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Customer No.	107540	}	
		}	
Group:	1663	}	
		}	
Confirmation No.:	6867	}	
		}	
Application No.:	15/468,494	}	
		}	
Invention:	NOVEL HERBICIDE RESISTANCE GENES	}	<u>ELECTRONICALLY FILED ON:</u>
		}	<u>August 3, 2021</u>
		}	
Inventor:	Wright et al.	}	
		}	
Filed:	March 24, 2017	}	
		}	
Attorney Docket:	14764-262737	}	
		}	
Examiner:	David Kruse	}	

AMENDMENT AND RESPONSE ACCOMPANYING RCE

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In response to the final Office Action mailed May 3, 2021, Applicant transmits herewith an RCE, and requests entry of the following claim amendments and consideration of the accompanying remarks. Applicant submits herewith payment of the \$100.00 fee under 37 CFR § 1.16(i) for an additional new claim in excess of 20, and the 2,000.00 fee for the RCE request (large entity, second request), and hereby authorizes the Commissioner to charge any additional fee necessary to affect this filing, to the account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to our file 14764-262737.

Amendments to the claims are submitted herewith beginning on page 2.

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-26 (Canceled).

27. (Previously presented) A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

$\text{HX}_{109}\text{D}(\text{X})_{111-134}\text{T}(\text{X})_{136-261}\text{H}(\text{X})_{263-272}\text{R}$, wherein

X_{109} represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

$(\text{X})_{111-134}$ represents a sequence of 24 amino acids;

$(\text{X})_{136-261}$ represents a sequence of 126 amino acids; and

$(\text{X})_{263-272}$ represents a sequence of 10 amino acids.

28. (Previously presented) The plant cell of claim 27 wherein the AAD-12 protein comprises an amino acid sequence having at least 90% sequence identity with SEQ ID NO: 2.

29. (Previously presented) The plant cell of claim 27 wherein said plant cell is dicotyledonous and selected from the group consisting of a cotton cell, a tobacco cell, a canola cell, a soybean cell, and an Arabidopsis cell.

30. (Currently amended) A transgenic plant comprising a plurality of the plant ~~cells~~ of claim 27, wherein expression of said polynucleotide renders said plant tolerant to an aryloxyalkanoate herbicide.

31. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a phenoxy auxin herbicide.

32. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of 2,4-dichlorophenoxyacetic acid, and MCPA.

33. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin.

34. (Previously presented) The plant of claim 30 wherein said aryloxyalkanoate herbicide is selected from the group consisting of triclopyr and fluroxypyr.

35. (Previously presented) The plant of claim 30 wherein expression of said polynucleotide renders said plant resistant to both a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

36. (Previously presented) The plant of claim 30 wherein said plant further comprises a second herbicide resistance gene.

37. (Previously presented) The plant of claim 36 wherein said second herbicide resistance gene renders said plant resistant to an herbicide selected from the group consisting of glyphosate, glufosinate, ALS inhibitors, inhibitors of 4-hydroxyphenyl-pyruvate-dioxygenase (HPPD), dicamba and inhibitors of protoporphyrinogen oxidase (PPO).

38. (Previously presented) A method of controlling at least one weed in a field, wherein said field contains at least one plant of claim 30, wherein said method comprises applying to at least a portion of said field a first herbicide selected from the group consisting of a phenoxy auxin herbicide and a pyridyloxy auxin herbicide.

39. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is an achiral phenoxy auxin selected from the group consisting of 2,4-D and MCPA.

40. (Previously presented) The method of claim 38 wherein said aryloxyalkanoate herbicide is a pyridyloxy auxin selected from the group consisting of triclopyr and fluroxypyr.

41. (Previously presented) The method of claim 38 wherein said method comprises applying a second herbicide.

42. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied sequentially.

43. (Previously presented) The method of claim 41 wherein said first herbicide and said second herbicide are applied concurrently.

44. (Previously presented) The method of claim 41 wherein said first herbicide is a phenoxy auxin and said second herbicide is a pyridyloxy auxin.

45. (Previously presented) The method of claim 41 wherein said second herbicide is selected from the group consisting of glyphosate, glufosinate, dicamba, acetolactate synthase inhibitors, protoporphyrinogen oxidase inhibitors, and hydroxyphenyl-pyruvate-dioxygenase inhibitors.

46. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glyphosate.

47. (Previously presented) The method of claim 41, wherein said first herbicide is 2,4-D and said second herbicide is glufosinate.

48. (Previously presented) The method of claim 41 wherein said plant further comprises a second herbicide resistance gene that renders said plant resistant to said second herbicide.

49. (Previously presented) The method of claim 48 wherein said second herbicide resistance gene is selected from the group consisting of a modified AHAS (acetohydroxyacid synthase) gene, a glyphosate resistance gene, glufosinate resistance gene, and a gene encoding a dicamba-degrading enzyme.

50. (Previously presented) The method of claim 49 wherein:
(a) said modified AHAS (acetohydroxyacid synthase) gene is selected from the group consisting of SurA, SurB, Csr1, Csr1-1, and Csr1-2;
(b) said glyphosate resistance gene is selected from the group consisting of modified EPSPS (5-enolpyruvylshikimate-3-phosphate synthase), GOX, and GAT; and, said glufosinate resistance gene is selected from the group consisting of phosphinothricin-N-acetyltransferase (PAT) and bar.

51. (Previously presented) The method of claim 41 wherein said method further comprises applying a third herbicide.

52. (Previously presented) The method of claim 51, wherein said third herbicide is selected from the group consisting of glyphosate, glufosinate, HPPD-inhibitors, PPO-inhibitors, ALS inhibitors, and dicamba.

53. (Previously presented) The method of claim 52 wherein said first, second and third herbicides are 2,4-D, quizalofop, and glyphosate.

54. (Currently amended) A seed comprising a plurality of the plant ~~cells~~ of claim 27.

55. (Currently amended) A method of controlling weeds in a field, wherein said method comprises applying a phenoxy auxin herbicide or a pyridyloxy auxin herbicide to said field and planting a seed of claim 54 in said field within 14 days ~~of~~ after applying said aryloxyalkanoate or pyridyloxy auxin herbicide.

56. (Canceled).

57. (Previously presented) A plant grown from the seed of claim 54 wherein said plant comprises said polynucleotide.

58. (Previously presented) A part, progeny, or asexual propagate of the plant of claim 57, wherein said part, progeny, or sexual propagate comprises said polynucleotide.

59. (Previously presented) A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

$\text{HX}_{109}\text{D}(\text{X})_{111-134}\text{T}(\text{X})_{136-261}\text{H}(\text{X})_{263-272}\text{R}$, wherein

X_{109} represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

$(\text{X})_{111-134}$ represents a sequence of 24 amino acids;

$(\text{X})_{136-261}$ represents a sequence of 126 amino acids; and

$(\text{X})_{263-272}$ represents a sequence of 10 amino acids, wherein said AAD-12 motif has 90% sequence identity with corresponding amino acids of position 108 to 273 of SEQ ID NO: 2.

60. (New) A method of controlling at least one weed in a field, wherein said field has been planted with seeds wherein cells of said seeds comprise

a recombinant polynucleotide that encodes an AAD-12 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and a pyridyloxy auxin herbicide, further wherein said AAD-12 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 2; and

ii) an AAD-12 motif having the general formula of:

$HX_{109}D(X)_{111-134}T(X)_{136-261}H(X)_{263-272}R$, wherein

X_{109} represents a single amino acid at position 109, relative to the sequence of SEQ ID NO: 2;

$(X)_{111-134}$ represents a sequence of 24 amino acids;

$(X)_{136-261}$ represents a sequence of 126 amino acids; and

$(X)_{263-272}$ represents a sequence of 10 amino acids,

wherein said method comprises applying to said field a pyridyloxy auxin herbicide.

REMARKS

Amendments to the Claims

Applicant has amended claims 30 and 54 to clarify antecedent basis. Claim 55 has been amended to clarify the timing of the application of the herbicide. Claim 60 is new and is directed to a method of controlling weeds by the application of a pyridyloxy auxin herbicide to a field comprising AAD-12 recombinant seeds/plants. Exemplary support for new claim 60 is found in claims 27 and 38 and at paragraph 19, lines 6-8, and paragraph 117, lines 5-8 of the application.

Claim Rejections

Indefiniteness Rejection

Claims 30 and 54 are rejected under 35 U.S.C. 112(b), as being indefinite. In particular, the Examiner contends that in claims 30 and 54, the limitation "plant cells of claim 27" lacks proper antecedent basis in claim 27 because said limitation is not in number agreement with "A transgenic plant cell" recited in claim 27. Applicant has amended claims 30 and 54 to replace "cells" with "cell" thus rendering the rejection moot.

The Obviousness Rejection Should Be Withdrawn

Claims 27-39, 41-54 and 57-59 stand rejected under 35 USC 103 as being obvious over the combined teachings of Kaphammer (US Patent 5,608,147) in view of Schleinitz et al (Applied and Environmental Microbiology 70(9): 5357-5365) and Pallett et al (US Patent 7,205,561). Kaphammer is cited as teaching plants that comprise a gene for conferring aryloxyalkanoate dioxygenase activity to those plants, and the use of such plants in methods of weed control using 2, 4-D. The Examiner admits that Kaphammer does not teach the AAD-12 protein (SEQ ID NO:2) or a nucleic acid sequence encoding such a protein. Schleinitz is cited as teaching the nucleic acid sequence of SEQ ID NO: 1 which encodes the protein of SEQ ID NO: 2. Pallett et al is cited for teaching transgenic plants that comprise various genes that confer herbicide tolerance to the plant.

The Examiner contends that it would have been *prima facie* obvious to substitute the gene of Schleinitz or Pallett for the gene disclosed in Kaphammer to generate the currently claimed plant. Applicants respectfully traverse this rejection.

The Office Action Fails to Establish Motivation to Combine

First of all, applicant respectfully submits that the Examiner fails to provide any rationale for why one of ordinary skill would specifically select a gene encoding a peptide of SEQ ID NO: 2, or a derivative thereof having at least 85% sequence identity to a peptide of SEQ ID NO: 2, to substitute for the gene disclosed in Kaphammer. Applicant notes there are many other known sequences that share a much higher sequence identity with the *tfdA* gene and can serve as possible candidates for providing aryloxyalkanoate dioxygenase activity. At the time of applicant's invention it cannot be reasonably said that one would have turned to the specific gene disclosed in Schleinitz with the expectation that it would be expressed in plants, particularly to convey herbicide tolerance to the plants.

At the time of the invention there was simply no motivation to select a bacterial gene having the specific sequence of SEQ ID NO: 2 for combination with a heterologous promoter that is functional in a plant cell for use in producing transgenic plants that are tolerant to damage by an aryloxyalkanoate herbicide. For example, as the specification states, identifying the SdpA (AAD-12) enzyme required mining an extensive database that, even under default search options, provide more than 100 other proteins as potential selections:

As a way to identify genes which possess herbicide degrading activities *in planta*, it is possible to mine current public databases such as NCBI (National Center for Biotechnology Information). To begin the process, it is necessary to have a functional gene sequence already identified that encodes a protein with the desired characteristics (i.e., α -ketoglutarate dioxygenase activity). This protein sequence is then used as the input for the BLAST (Basic Local Alignment Search Tool) (Altschul et al., 1997) algorithm to compare against available NCBI protein sequences deposited. Using default settings, this search returns upwards of 100 homologous protein sequences at varying levels of sequence identity. These range from highly identical (85-98%) to very low identity (23-32%) at the amino acid level. Traditionally, only sequences with high homology would be expected to retain similar properties to the input sequence. In this case applicant chose only those sequences with $\leq 50\%$ homology. Specification at ¶ [0156] (emphases added).

As noted in paragraph 7 of the attached 37 CFR 1.132 Declaration by Dr. Wright ('the "Wright Declaration"), at the time of the invention, the standard practice used for identifying proteins exhibiting a similar functionality to a known protein was to screen for proteins having a high level of amino acid sequence identity with the known protein, and then test those selected

proteins for activity. However, applicant selected sequences with relatively low sequence identity of $\leq 50\%$ homology with the *tfdA* gene. Proceeding contrary to the accepted wisdom (i.e., selecting low sequence identity homologs to test) is an indicia of nonobviousness. Surprisingly, applicant's unusual approach resulted in the discovery that cloning and recombinantly expressing homologues with as little as 31% amino acid conservation can be used to impart commercial levels of resistance in planta, to a phenoxy auxin herbicide as well as substrates never previously tested with these enzymes.

As noted in paragraph 6 of the Wright Declaration, although many α -ketoglutarate-dependent dioxygenases were known, no gene except *tfdA* had exhibited the ability to degrade phenoxy auxin herbicides when inserted into plant cells. Furthermore, those skilled in the art appreciate that there is a high level of unpredictability associated with expressing bacterial genes in plant systems. Thus the skilled practitioner would not have a reasonable expectation of success associated with the selection of the bacterial gene disclosed in Schleinitz for expression in a plant as a substitute for the gene disclosed in Kaphammer. On the contrary, the skilled practitioner would be motivated to select and test only those TfdA homologs that exhibit high sequence identity with the only α -ketoglutarate-dependent dioxygenase that had been demonstrated to provide herbicide tolerance to phenoxy auxin herbicides when expressed in plants.

As discussed above, a skilled practitioner searching for a suitable substitute for *tfdA* would have a large number of possible choices, including many having a higher % identity to TfdA than the SdpA protein disclosed by Schleinitz. Conventional wisdom would dictate that homologs having a high level of sequence identity would be the obvious choice for selection with the expectation that they would have been more likely to provide phenoxy auxin tolerance when expressed in a plant. Yet, applicant demonstrated that selecting a lower % identity enzyme could impart commercial levels of resistance in planta, and not only to a phenoxy auxin herbicide but also to substrates (i.e. a pyridyloxy auxin herbicide), never previously tested with these enzymes.

None of the cited prior art references taught the characteristics as claimed. As illustrated by the subject specification, the data of Tables 9 & 10 demonstrates AAD-12 is able to degrade the pyridyloxyacetate auxins (e.g., triclopyr, fluroxypyr) in addition to achiral phenoxy auxins (e.g., 2,4-D, MCPA, 4-chlorophenoxyacetic acid). Previous to applicants' disclosure, there was

no expectation that such plants could effectively produce an AAD-12 enzyme to render the plants resistant to a phenoxyacetic acid herbicide (such as 2,4-D) and/or one or more pyridyloxyacetate herbicides such as triclopyr and fluroxypyr. Accordingly, there was no teaching or suggestion that a method of treating weeds could be conducted in a field using a pyridyloxy auxin herbicide, wherein the crop plants growing in the field are tolerant against the pyridyloxy auxin herbicide due to expression of the AAD-12 gene. Thus, the subject invention provides many advantages that were not heretofore thought to be possible in the art.

Applicant respectfully submits that it is not seen how the secondary references of Schleinitz or Pallett would support the reasonable expectation of success to produce a plant that is resistant to pyridyloxyacetate herbicides, thus protecting a crop plant from damage by pyridyloxyacetate herbicides such as triclopyr and fluroxypyr, or why a skilled practitioner would select a gene having low sequence identity to *tdfA* for testing. Accordingly, there was no reason to select the nucleic acid of SEQ ID NO: 1, or a derivative thereof, to be operably linked to a plant specific promoter, as there was no reasonable expectation that such a construct would produce the desired effect when transfected into plant cells.

The Examiner has cited Schleinitz as teaching the nucleic acid sequence of SEQ ID NO: 1 which encodes the protein of SEQ ID NO: 2 and contends it was obvious to try to substitute this gene for the *tfda* aryloxyalkanoate dioxygenase gene disclosed in Kaphammer. However, as noted in paragraph 8 of the Wright Declaration, Schleinitz only discloses *in vitro* enzymatic activity of SdpA, and there is no teaching provided by any of the cited prior art to indicate that the *sdpA* bacterial gene would provide tolerance to phenoxy auxin herbicides upon introduction into plant cells. Due to the unpredictability of the activity of bacterial genes in plant systems, contrary to the Examiner's assertions, there was no reasonable expectation of success based on the combined teachings of Kaphammer and Schleinitz that a plant transformed with the *sdpA* gene would produce a plant having tolerance to a phenoxy auxin herbicide, nor was there any rationale for selectively choosing the *sdpA* gene from the many other *tfda* -like bacterial genes for combination with a plant promoter.

The Federal Circuit has differentiated between proper and improper applications of "obvious to try" in *In re O'Farrell*, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir.). More particularly, two classes of improper obvious to try were exemplified as follows: (1) when what would have been "obvious to try" would have been to vary all parameters or try each of

numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful; and (2) when what was “obvious to try” was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it. The prior art fails to provide any direction as to which of the many possible known *tfdA* homologs would impart commercial levels of resistance upon expression in plants.

The Examiner states on page 6 of the office action that “...if one of ordinary skill in the art identifies a gene that encodes a protein that enzymatically degrades a known herbicide (2,4-D for example) by a known process (oxidation) it would have been obvious to transform a plant with such a gene to try to make an herbicide tolerant plant thereby.” However such a statement is inconsistent with the known unpredictability of bacterial gene expression/function in plants as noted in paragraphs 9 and 10 of the Wright Declaration. The skilled practitioner is well aware that an established *in vitro* activity of a bacterial enzyme is not a definitive predictor of the enzyme’s activity when expressed in plants. This effect has been demonstrated in the very α -ketoglutarate dioxygenase family of the present invention (see paragraphs 9 and 10 and Appendix II of the Wright Declaration).

The Examiner has failed to provide any rationale for specifically selecting the *sdpA* gene from the other 100 candidates other than rely on an improper obvious to try standard requiring one to “try each of numerous possible choices until one possibly arrived at a successful result”. However, even such efforts would not be likely to come up with the invention as claimed. Many of the 100 BLAST search results could potentially produce a plant that exhibits the minimal phenoxy auxin herbicide tolerance (cited by the Examiner as motivation for substituting the *tfdA* gene with the *sdpA* gene) without revealing a protein having the activity of enzymatically degrading a phenoxy auxin herbicide and a pyridyloxy auxin herbicide as required by the claims. Accordingly, the combined teachings of the cited prior art fail to suggest or provide any guidance of how to obtain a gene and recombinant plant that has the functionality of the present claimed invention.

Applicant respectfully requests the withdrawal of the rejection of claims 27-39, 41-54 and 57-58 as being obvious over the combined teachings of Kaphammer in view of Schleinitz et al and Pallett et al.

Double Patenting Rejections

Claims 27-55, and 57-59 are rejected for obviousness type double patenting over claims 1-20 of US Patent No 8,916,752. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-14 of US Patent No 8,283,522. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-6, 11-15 and 19-24 of US Patent no 9,944,944. Claims 27-55 and 57-59 are rejected for obviousness type double patenting over claims 1-25 of US Patent no 10,167,483. Applicant will file the necessary terminal disclaimers to overcome these rejections upon a finding of allowable subject matter.

With the entry of the foregoing amendments, the application is believed to be in condition for examination and allowance. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Respectfully submitted,

/John P. Breen/

John P. Breen
Attorney Reg. No. 38,833

Indianapolis, Indiana 46204
317-261-7940



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867
107540	7590	09/03/2021		
Barnes & Thornburg LLP (Dow)			EXAMINER	
11 South Meridian Street			KRUSE, DAVID H	
Indianapolis, IN 46204				
			ART UNIT	PAPER NUMBER
			1663	
			NOTIFICATION DATE	DELIVERY MODE
			09/03/2021	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

INDocket@btlaw.com

Status of the Application

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3 August 2021 has been entered.
2. The rejection of claims 30 and 54 under 35 USC 112, second paragraph, is withdrawn in view of Applicant's amendments to the claims.
3. The Wright Declaration filed under 37 C.F.R. 1.132 on 3 August 2021 and signed on 29 July 2021 has been fully considered. In view of Inventor Wright's Declaration the rejection under 35 U.S.C. 103(a) is withdrawn.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper time-wise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based e-Terminal Disclaimer may be filled out completely online using web-screens. An e-Terminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about e-Terminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

5. Claims 27-55 and 57-59 remain and claim 60 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 8,916,752. Although the claims at issue are not identical, they are not patentably

distinct from each other because the subgenus claimed in the '752 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 13 of the Remarks). Because the instant rejection is not provisional the rejection is maintained for the reasons of record.

6. Claims 27-55 and 57-59 remain and claim 60 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 8,283,522. Although the claims at issue are not identical, they are not patentably distinct from each other because the subgenus claimed in the '522 Patent both anticipates and renders obvious the instantly claimed genus. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 13 of the Remarks). Because the instant rejection is not provisional the rejection is maintained for the reasons of record.

7. Claims 27-55 and 57-59 remain and claim 60 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-6, 11-15 and 19-24 of U.S. Patent No. 9,944,944. Although the claims at issue are not identical, they are not patentably distinct from each other because the species claimed in the '944 Patent renders obvious the instantly claimed genus as the instant claims include soybean cells at instant claim 29. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 13 of the Remarks). Because the instant rejection is not provisional the rejection is maintained for the reasons of record.

8. Claims 27-55 and 57-59 remain and claim 60 is rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-25 of U.S. Patent No. 10,167,483. Although the claims at issue are not identical, they are not patentably distinct from each other because the instantly claimed transgenic plant cell would have been obvious over the expression cassette of claim 1 of the '483 Patent and the claimed methods herein overlap in scope with those of the '483 Patent. Applicant argues that the necessary terminal disclaimer(s) will be filed to overcome the rejection upon a finding of allowable subject matter (page 13 of the Remarks). Because the instant rejection is not provisional the rejection is maintained for the reasons of record.

Conclusion


9. No claims are allowed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799 and direct fax number (571) 273-0799. The examiner can normally be reached on Monday to Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amjad Abraham can be reached at (571) 270-7058. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/
Primary Examiner, Art Unit 1663

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

CPC - Searched*		
Symbol	Date	Examiner
C12N 9/0071	04/16/2019	/DK/


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor Name Search	04/16/2019	/DK/
EAST: USPAT, USPGPUB, EPO, JPO, DERWENT	04/16/2019	/DK/
STN: AGRICOLA, BIOSIS, CAPLUS, EMBASE, CABA	04/16/2019	/DK/
Sequence Search SEQ ID NO: 2	02/01/2019	/DK/
Update EAST	12/16/2019	/DK/
Update EAST	07/17/2020	/DK/
Update EAST	04/27/2021	/DK/
Update EAST	08/30/2021	/DK/

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	9,986	C12N9/0071.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11
L2	122	L1 AND "aad-12"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11
L3	63	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11
S1	7	((("8283522") or ("9944944") or ("8916751") or ("8685677") or ("9232803") or ("8916752") or ("10167483"))).PN.	USPAT; USOCR	OR	OFF	2019/04/16 13:07
S2	0	"AAD-12.clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S3	0	"AAD-12"" .clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S4	663	AAD-12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S5	50	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S6	52	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/16 09:34
S7	1	("7205561").PN.	USPAT; USOCR	OR	OFF	2019/12/17 15:03
S8	507	Pallett.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06

S9	16	S8 and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06
S10	0	Kaphammer.in. and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08
S11	19	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08
S12	56	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
S13	21	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
S14	1	("10167483").PN.	USPAT; USOCR	OR	OFF	2020/07/20 13:36
S15	63	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
S16	9,690	C12N9/0071.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
S17	120	S16 AND "aad-12"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:59
S18	4	((("10167483") or ("8916752") or ("8283522") or ("9944944")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:00
S19	3	((("9232803") or ("8685677") or ("8916751")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:10

EAST Search History (Interference)

<This search history is empty>

8/30/2021 10:12:17 AM

C:\Users\dkruse\Documents\EAST\Workspaces\15468494.wsp

Electronic Acknowledgement Receipt

EFS ID:	44416842
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:47:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	AAA21983.pdf	40042	no	1
			b8e2e85b59af8d81bee22bdd3d494e5141596d15		

Warnings:

Information:					
2	Non Patent Literature	AAB47567.pdf	38186	no	1
			75a993e1be117d912797aa871c53390e1121de58		
Warnings:					
Information:					
3	Non Patent Literature	AAK81681.pdf	53564	no	2
			0c0774467cba4e3bcaaf3817cfe791730bc87ade		
Warnings:					
Information:					
4	Non Patent Literature	AAM76772.pdf	61075	no	2
			79cc575d232409148e65e51ec032f2684bc40494		
Warnings:					
Information:					
5	Non Patent Literature	AAS49436.pdf	48142	no	2
			c5473463f06c858ce00eb5580456c2a72b56134a		
Warnings:					
Information:					
6	Non Patent Literature	ABD67501.pdf	50412	no	2
			6684fec54137475b2f950304d096597a4db41205		
Warnings:					
Information:					
7	Non Patent Literature	Applied_and_Environmental_Microbiolog_2004_Schleinitz.pdf	1006584	no	9
			cb0d221898cb951047adad37e142f302a2ad70d4		
Warnings:					
Information:					
8	Non Patent Literature	BAB92956.pdf	42244	no	1
			95481a2146e82b2274143eea1841f049c03a8013		
Warnings:					
Information:					

9	Non Patent Literature	BAB92964.pdf	42538	no	1
			e9b93503e004bb40751a9ce6bbe05da8719c733a		
Warnings:					
Information:					
10	Non Patent Literature	BAB92965.pdf	42431	no	1
			b3ebb4ebb8fadab0c93bd587db3423fc6c0c3d9f		
Warnings:					
Information:					
11	Non Patent Literature	Baelum_Compariso.pdf	333928	no	10
			e4e5a8809ff9aee395aa86ed8471c4a37748ba82		
Warnings:					
Information:					
12	Non Patent Literature	Acta_Biotechnol_1997_Ehrig.pdf	802583	no	6
			2b662c86329a836194a32770ef60562f518aa7ec		
Warnings:					
Information:					
Total Files Size (in bytes):			2561729		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44416942
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:47:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Baelum_Degradation.pdf	887196	no	13
			a45a755a3b17f49883d85a5834e5952e321314a1		

Warnings:

Information:					
2	Non Patent Literature	Baelum_Taqman.pdf	971811	no	5
			c45860d78205aabcb61306898f1daa1bf2b3a80ee		
Warnings:					
Information:					
3	Non Patent Literature	Bayley.pdf	1097444	no	5
			52fb57769217f5598173c52a8729113b60123f2e		
Warnings:					
Information:					
4	Non Patent Literature	Bhat_Purification_of_3_5-dichlorocatechol.pdf	752977	no	9
			37011996c72f52db32d0a7ca9127f55e34bdcd2dd		
Warnings:					
Information:					
5	Non Patent Literature	Biotechnology_Letters_1998_Vallaes.pdf	118490	no	4
			347e731707227f9bbede256e9b47930b65338d39		
Warnings:					
Information:					
6	Non Patent Literature	Bisht_et_al.pdf	2265294	no	4
			3022301050ba54d4813ee7d3f412296ba9d6a2bf		
Warnings:					
Information:					
7	Non Patent Literature	Chaudhry.pdf	1308477	no	6
			0f41225099de985a77b6fc683f9af72dc326b1af		
Warnings:					
Information:					
8	Non Patent Literature	Chekan_Molecular_basis.pdf	1282440	no	22
			8d3a2254f9df95f11cf637a9ea11c981315ee6f4		
Warnings:					
Information:					

9	Non Patent Literature	Chekan_Supplemental_Molecular_Basis.pdf	1282440 9d42eab55a3cde0fb91adfffb5742887337e7a32	no	22
Warnings:					
Information:					
10	Non Patent Literature	Cho.pdf	993895 ea10d2fb423439fa551347d05df743b4c1ef5894	no	5
Warnings:					
Information:					
11	Non Patent Literature	Cosper.pdf	118914 4cbcd88a21f0d5010acbe8d26bb22d2acf50e804	no	8
Warnings:					
Information:					
12	Non Patent Literature	Critical_Rev_Bch_39_21-68_2004_Hausinger-review_of_a-keto.pdf	691004 92f5aae0a22ff1c5e6e0ede1a3b7a3e1cf724b11	no	48
Warnings:					
Information:					
Total Files Size (in bytes):			11770382		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313
(317) 231-7433 Fax

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>Customer No.:</i>	107540	}
		}
<i>Group:</i>	1663	}
		}
<i>Confirmation No.:</i>	6867	}
		}
<i>Application No.:</i>	15/468,494	}
		}
<i>Invention:</i>	Novel Herbicide Resistance Genes	}
		}
<i>Applicant:</i>	Terry Wright et al.	}
		}
<i>Filed:</i>	March 24, 2017	}
		}
<i>Attorney Docket:</i>	14764-262737	}
		}
<i>Examiner</i>	DAVID KRUSE	}

FILED ELECTRONICALLY:

December 2, 2021

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Statement is filed in the captioned application identified above pursuant to 37 C.F.R. § 1.56. No representation is intended that a complete search has been made of the prior art or that no better art references than those listed are available. The filing of this Statement shall not be construed to be an admission that the information cited in the Statement is, or is considered to be, material to patentability as defined in §1.56(b). Pursuant to 37 C.F.R. § 1.98(a)(2)(ii), copies of cited U.S. patents and patent publications are not provided herewith; a copy of each cited foreign and non-patent reference is provided herewith for review by the Examiner.

None of the cited art is believed to disclose or suggest the invention recited in the claims of the captioned application. It is therefore believed that the claimed invention is patentably distinguishable over these references.

Applicant submits herewith the \$260.00 fee set forth in 37 CFR 1.17 (p) and authorize the Commissioner to charge any additional fee necessary to affect this filing to our Deposit Account No. 10-0435, with reference to our Matter No. 14764-262737.

Respectfully submitted,

/John P. Breen/

John P. Breen
Registration No. 38,833
Attorney for Applicants

JPB:pey
(317) 261-7940
Indianapolis, Indiana 46204

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)
	<u>5135867</u>	August 1992	Payne et al.			
	<u>5273894</u>	December 1993	Strauch et al.			
	<u>5316931</u>	May 1994	Donson et al.			
	<u>5463175</u>	October 1995	Barry et al.			
	<u>5500360</u>	March 1996	Ahlquist et al.			
	<u>5561236</u>	October 1996	Leemans et al.			
	<u>5589367</u>	December 1996	Donson et al.			
	<u>5637489</u>	June 1997	Strauch et al.			
	<u>5646024</u>	July 1997	Leemans et al.			
	<u>5648477</u>	July 1997	Leemans et al.			
	<u>5879903</u>	March 1999	Strauch et al.			
	<u>5910626</u>	June 1999	Haselkorn			
	<u>6087563</u>	July 2000	DellaPenna			
	<u>6107549</u>	August 2000	Feng et al.			
	<u>6153401</u>	November 2000	Streber et al.			
	<u>6268547</u>	July 2001	Weeks			
	<u>6518222</u>	February 2003	Arndt et al.			
	<u>7112665</u>	September 2006	Leemans et al.			
	<u>7405074</u>	July 2008	Castle et al.			
	<u>7462481</u>	December 2008	Castle et al.			
	<u>7659448</u>	February 2010	Ahrens et al.			
	<u>7838733</u>	November 2010	Wright et al.			
	<u>7863503</u>	January 2011	Castle et al.			
	<u>7998703</u>	August 2011	Castle et al.			

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)
	<u>8222489</u>	July 2012	Castle et al.			
	<u>8598413</u>	December 2013	Cui et al.			
	<u>9074007</u>	July 2015	Danilevskaya et al.			
	<u>9127289</u>	September 2015	Wright			
	<u>10174337</u>	January 2019	Wright			
	<u>2002/0059659</u>	May 2002	Stemmer			
	<u>2003/0041357</u>	February 2003	Jepson			
	<u>2003/0056245</u>	March 2003	Chatterjee et al.			
	<u>2003/0135879</u>	July 2003	Weeks et al.			
	<u>2009/0069182</u>	March 2009	Castle et al.			
	<u>2012/0245339</u>	September 2012	Castle et al.			
	<u>2014/0325713</u>	October 2014	Kovalic et al.			
	<u>2016/0108422</u>	April 2016	Ellis			

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Document Number	Publication Date	Country	Translation	
				Yes	No
	1471533	Jan 2004	CN		
	1025250	May 1999	EP		
	1167531	Jan 2002	EP		
	1740039	Jun 2012	EP		
	EP1695983B1	Aug 2006	EP		
	2005/287415	Oct 2005	JP		
	87/05629	Sep 1987	WO		
	96/33270	Oct 1996	WO		
	97/13402	Apr 1997	WO		
	98/02562	Jan 1998	WO		
	9808963	Mar 1998	WO		
	9820144	May 1998	WO		
	98/20144	May 1998	WO		
	9838294	Sep 1998	WO		
	9838336	Sep 1998	WO		
	9844139	Oct 1998	WO		
	9910513	Mar 1999	WO		
	1999/063092	Dec 1999	WO		
	2000/006757	Feb 2000	WO		
	0009727	Feb 2000	WO		
	0066748	Nov 2000	WO		
	2001/038513	May 2001	WO		
	03/013224	Feb 2003	WO		
	2003/056904	Jul 2003	WO		

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Kohler, Genbank Accession No. Q8KSC8 first published on Oct. 1, 2002 (Year: 2002).
	Hogan et al, The Journal of Biological Chemistry, 275(17): 12400-12409 (Year: 2000).
	Genbank Accession No. M16730, Apr. 1993.
	Horvath, M. et al., Isolation and characterization of a 2-(2,4-dichlorophenoxy) propionic acid-degrading . . . , Appl. Microbiol Biotechnol., 1990, pp. 33, 213-216, (Abstract only).
	Kohler, Sphingomonas herbicidovorans tnpA gene for transposase and rdpA gene for (R)-2-(2,4-dichlorophenoxy) propionate, 2-oxoglutarate dioxygenase, Database EMBI, Accession No. AJ628859, Mar. 3, 2004, pp. 1-2.
	Kohler, "Sphingomonas herbicidovorans MH: A versatile phenoxyalkanoic acid herbicide degrader," J. Industrial Microbiology & Biotechnology, vol. 23, No. 4-5: 336-340 (Oct. 1999).
	Lyon, B.R., et al., "Cotton plants transformed with a bacterial degradation gene are protected from accidental spray drift damage by the herbicide 2,4-dichlorophenoxyacetic acid," Transgenic Res., 1993, pp. 2: 166-169.
	Lyon, B.R., et al., Expression of a bacterial gene in transgenic tobacco confers resistance to the herbicide 2,4-dichlorophenoxyacetic acid, Transgenic Res., 1989, pp. 33: 166-169.
	Schleinitz, K.M., Localization and Characterization of Two Novel Genes Encoding Sterospecific Diosxygenases Catalyzing 2(2,4-Dichlorophenoxy) propionate cleavage in Delftia acidovorans MCI, Applied and Environmental Microbiology, Sep. 2004, pp. 5357-5365, vol. 70, No. 9.
	Smejkal, C.W. et al., "Substrate specificity of chlorophenoxyalkanoic acid-degrading bacteria is not dependent upon phylogenetically related tfdA gene types," Biol. Fertil., 2001, pp. 33:507-513.
	Spencer et al., Segregation of transgenes in maize, Plant Molecular Biology, Jan. 1992, pp. 201-210, vol. 18, Issue 2.
	Streber et al., Analysis, cloning, and high-level expression of 2,4-dichlorophenoxyacetic monooxygenase gene tfdA of Alcaligenes eutrophus JMP134, J. Bacteriol., 1987, pp. 169: 2950-2955.
	Streber et al., Transgenic tobacco plants expressing a bacterial detoxifying enzyme are resistant to 2,4-D, Bio/Technology, 1989, pp. 7:811-816 (Abstract only).
	van der Meer, Genbank Accession No. AJ628859, NCBI-National Library of Medicine USA, Bethesda, Maryland (Mar. 3, 2004).
	Westendorf et al., The two enantiospecific dichlorprop/.alpha.-ketoglutarate-dioxygenases from Delftia acidovorans MC1--protein and sequence data of RdpA and SdpA, Microbiol. Res., 2002, pp. 157:317-322 (Abstract only).
	Muller et al, Protein Science (2006), 15:1356-1368.
	Bayley et al., Engineering 2,4-D resistance into cotton, Theoretical and Applied Genetics (1992), 83(5), 645-9.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Bhat et al., Purification of 3,5-dichlorocatechol 1,2-dioxygenase, a nonheme iron dioxygenase and a key enzyme in the biodegradation of a herbicide, 2,4-dichlorophenoxyacetic acid (2,4-D), from <i>Pseudomonas cepacia</i> CSV90, Archives of Biochemistry and Biophysics (1993), 300(2), 738-46.
	Chaudhry and Huang, Isolation and characterization of a new plasmid from a <i>Flavobacterium</i> sp. which carries the genes for degradation of 2,4-dichlorophenoxyacetate, Journal of Bacteriology (1988), 170(9), 3897-902.
	Chen and Martin, Reasons for the acclimation for 2,4-D biodegradation in lake water, Journal of Environmental Quality (1989), 18(2), 153-6.
	Cosper et al., X-ray absorption spectroscopic analysis of Fe(II) and Cu(II) forms of a herbicide-degrading ketoglutarate dioxygenase, JBIC, Journal of Biological Inorganic Chemistry (1999), 4(1), 122-129.
	De Liphay et al., Enhanced degradation of phenoxyacetic acid in soil by horizontal transfer of the <i>tfdA</i> gene encoding a 2,4-dichlorophenoxyacetic acid dioxygenase, FEMS Microbiology Ecology (2001), 35(1), 75-84.
	De Liphay et al., Expression of <i>tfdA</i> genes in aquatic microbial communities during acclimation to 2,4-dichlorophenoxyacetic acid, FEMS Microbiology Ecology (2002), 40(3), 205-214.
	De Liphay et al., In situ exposure to low herbicide concentrations affects microbial population composition and catabolic gene frequency in an aerobic shallow aquifer, Applied and Environmental Microbiology (2003), 69(1), 461-467.
	Feng and Kennedy, Biodegradation and plant protection from the herbicide 2,4-D by plant-microbial associations in cotton production systems, Biotechnology and Bioengineering (1997), 54(6), 513-519.
	Fuechslin et al., Effect of integration of a GFP reporter gene on fitness of <i>Ralstonia eutropha</i> during growth with 2,4-dichlorophenoxyacetic acid, Environmental Microbiology (2003), 5(10), 878-887.
	Harker et al., Phenoxyacetic acid degradation by the 2,4-dichlorophenoxyacetic acid (TFD) pathway of plasmid pJP4: mapping and characterization of the TFD regulatory gene, <i>tfdR</i> , Journal of Bacteriology (1989), 171(1), 314-20.
	Hawkins and Harwood, Chemotaxis of <i>Ralstonia eutropha</i> JMP134(pJP4) to the herbicide 2,4-dichlorophenoxyacetate, Applied and Environmental Microbiology (2002), 68(2), 968-972.
	Hoffmann et al., A transposon encoding the complete 2,4-dichlorophenoxyacetic acid degradation pathway in the alkali-tolerant strain <i>Delftia acidovorans</i> P4a, Microbiology (Reading, United Kingdom) (2003), 149(9), 2545-2556.
	Hogan et al., Distribution of the <i>tfdA</i> gene in soil bacteria that do not degrade 2,4-dichlorophenoxyacetic acid (2,4-D), Microbial Ecology (1997), 34(2), 90-96
	Hogan et al., Site-directed mutagenesis of 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase. Identification of residues involved in metallocenter formation and substrate binding, Journal of Biological Chemistry (2000), 275(17), 12400-12409.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Jackman et al., Electrokinetic movement and biodegradation of 2,4-dichlorophenoxyacetic acid in silt soil, <i>Biotechnology and Bioengineering</i> (2001), 74(1), 40-48.
	Ka and Tiedje, Integration and excision of a 2,4-dichlorophenoxyacetic acid-degradative plasmid in <i>Alcaligenes paradoxus</i> and evidence of its natural intergeneric transfer, <i>Journal of Bacteriology</i> (1994), 176(17), 5284-9.
	Ka et al., Use of gene probes to aid in recovery and identification of functionally dominant 2,4-dichlorophenoxyacetic acid-degrading populations in soil, <i>Applied and Environmental Microbiology</i> (1994), 60(4), 1116-20.
	Kitagawa et al., Novel 2,4-dichlorophenoxyacetic acid degradation genes from oligotrophic <i>Bradyrhizobium</i> sp. strain HW13 isolated from a pristine environment, <i>Journal of Bacteriology</i> (2002), 184(2), 509-518.
	Kleinstueber et al., Expression of the 2,4-D degradative pathway of pJP4 in an alkaliphilic, moderately halophilic soda lake isolate, <i>Halomonas</i> sp. EF43, <i>Extremophiles</i> (2001), 5(6), 375-384.
	Laemmli et al., Mutation analysis of the different <i>tfd</i> genes for degradation of chloroaromatic compounds in <i>Ralstonia eutropha</i> JMP134, <i>Archives of Microbiology</i> (2004), 181(2), 112-121. (Published online: Dec. 16, 2003).
	Laurent et al., 2,4-Dichlorophenoxyacetic Acid Metabolism in Transgenic Tolerant Cotton (<i>Gossypium hirsutum</i>), <i>Journal of Agricultural and Food Chemistry</i> (2000), 48(11), 5307-5311
	Loos et al., Phenoxyacetate herbicide detoxication by bacterial enzymes, <i>Journal of Agricultural and Food Chemistry</i> (1967), 15(5), 858-60.
	Ludwig et al., Chromatographic separation of the enantiomers of marine pollutants. Part 5: enantioselective degradation of phenoxycarboxylic acid herbicides by marine microorganisms, <i>Chemosphere</i> (1992), 24(10), 1423-9.
	Mae et al., Characterization of a new 2,4-dichlorophenoxyacetic acid degrading plasmid pEST4011: physical map and localization of catabolic genes, <i>Journal of General Microbiology</i> (1993), 139(12), 3165-70.
	Maltseva et al., Degradation of 2,4-dichlorophenoxyacetic acid by haloalkaliphilic bacteria, <i>Microbiology (Reading, United Kingdom)</i> (1996), 142(5), 1115-1122.
	Marriott et al., Biodegradation of mixtures of chlorophenoxyalkanoic acid herbicides by <i>Alcaligenes denitrificans</i> , <i>Journal of Industrial Microbiology & Biotechnology</i> (2000), 25(5), 255-259.
	Matheson et al., Evidence for acquisition in nature of a chromosomal 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase gene by different <i>Burkholderia</i> spp, <i>Applied and Environmental Microbiology</i> (1996), 62(7), 2457-2463.
	McGowan et al., Evidence for interspecies gene transfer in the evolution of 2,4-dichlorophenoxyacetic acid degraders, <i>Applied and Environmental Microbiology</i> (1998), 64(10), 4089-4092.
	Muller and Babel, Pseudo-recalcitrance of chlorophenoxyalkanoate herbicides--correlation to the availability of ketoglutarate, <i>Acta Biotechnologica</i> (2001), 21(3), 227-242.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Muller and Babel, Separation of two dichlorprop/ketoglutarate dioxygenases with enantiospecific properties from Comamonas acidovorans MC1, Acta Biotechnologica (1999), 19(4), 349-355.
	Muller et al., Comamonas acidovorans strain MC1. A new isolate capable of degrading the chiral herbicides dichlorprop and mecoprop and the herbicides 2,4-D and MCPA, Microbiological Research (1999), 154(3), 241-246.
	Nickel et al., Involvement of two ketoglutarate-dependent dioxygenases in enantioselective degradation of (R)- and (S)-mecoprop by Sphingomonas herbicidovorans MH, Journal of Bacteriology (1997), 179(21), 6674-6679.
	Ohkouchi et al., Cloning and expression of DL-2-haloacid dehalogenase gene from Burkholderia cepacia, Water Science and Technology (2000), 42(7-8, Hazard Assessment and Control of Environmental Contaminants (Eco hazard 99)), 261-268.
	Parker and Doxtader, Kinetics of microbial decomposition of 2,4-D in soil: effects of herbicide concentration, Journal of Environmental Quality (1982), 11(4), 679-84.
	Perkins et al., Use of Alcaligenes eutrophus as a source of genes for 2,4-D resistance in plants, Weed Science (1987), 35(Suppl. 1), 12-18.
	Plumeier et al., Importance of different tfd genes for degradation of chloroaromatics by Ralstonia eutropha JMP134, Journal of Bacteriology (2002), 184(15), 4054-4064.
	Poh et al., Complete characterization of Tn5530 from Burkholderia cepacia strain 2a (pIJB1) and studies of 2,4-dichlorophenoxyacetate uptake by the organism, Plasmid (2002), 48(1), 1-12.
	Preston et al., Multiple resistance to dissimilar herbicide chemistries in a biotype of Lolium rigidum due to enhanced activity of several herbicide degrading enzymes, Pesticide Biochemistry and Physiology (1996), 54(2), 123-134.
	Saari et al., Stereospecific degradation of the phenoxypropionate herbicide dichlorprop, Journal of Molecular Catalysis B: Enzymatic (1999), 6(4), 421-428.
	Schneiderheinze et al., Plant and soil enantioselective biodegradation of racemic phenoxyalkanoic herbicides, Chirality (1999), 11(4), 330-337.
	Shaw and Burns, Enhanced mineralization of [U-14C]2,4-dichlorophenoxyacetic acid in soil from the rhizosphere of Trifolium pratense, Applied and Environmental Microbiology (2004), 70(8), 4766-4774.
	Tett et al., Enantioselective degradation of the herbicide mecoprop [2-(2-methyl-4-chlorophenoxy)propionic acid] by mixed and pure bacterial cultures, FEMS Microbiology Ecology (1994), 14(3), 191-200.
	Top et al., Capture of a catabolic plasmid that encodes only 2,4-dichlorophenoxyacetic acid:ketoglutaric acid dioxygenase (TfdA) by genetic complementation, Applied and Environmental Microbiology (1996), 62(7), 2470-2476.
	Top et al., Methane oxidation as a method to evaluate the removal of 2,4-dichlorophenoxyacetic acid (2,4-D) from soil by plasmid-mediated bioaugmentation, FEMS Microbiology Ecology (1999), 28(3), 203-213.
	Travkin et al., Characterization of an intradiol dioxygenase involved in the biodegradation of the chlorophenoxy herbicides 2,4-D and 2,4,5-T, FEBS Letters (1997), 407(1), 69-72.
EXAMINER:	DATE CONSIDERED:

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
INFORMATION DISCLOSURE STATEMENT	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Vallaey et al., PCR-RFLP analysis of 16S rRNA, tfdA and tfdB genes reveals a diversity of 2,4-D degraders in soil aggregates, FEMS Microbiology Ecology (1997), 24(3), 269-278.
	Vallaey et al., The metabolic pathway of 2,4-dichlorophenoxyacetic acid degradation involves different families of tfdA and tfdB genes according to PCR-RFLP analysis, FEMS Microbiology Ecology (1996), 20(3), 163-172.
	Vedler et al., Analysis of the 2,4-dichlorophenoxyacetic acid-degradative plasmid pEST4011 of Achromobacter xylosoxidans subsp. denitrificans strain EST4002, Gene (2000), 255(2), 281-288.
	Vedler et al., TfdR, the LysR-type transcriptional activator, is responsible for the activation of the tfdCB operon of Pseudomonas putida 2,4-dichlorophenoxyacetic acid degradative plasmid pEST4011, Gene (2000), 245(1), 161-168.
	Zhang et al., In vitro assay for 2,4-D resistance in transgenic cotton, in Vitro Cellular & Developmental Biology: Plant (2001), 37(2), 300-304.
	Zipper et al., Complete microbial degradation of both enantiomers of the chiral herbicide mecoprop [(RS)-2-(4-chloro-2-methylphenoxy)propionic acid] in an enantioselective manner by Sphingomonas herbicidovorans sp. Nov, Applied and Environmental Microbiology (1996), 62(12), 4318-4322.
	Zipper et al., Enantioselective uptake and degradation of the chiral herbicide dichlorprop [(RS)-2-(2,4-dichlorophenoxy)propanoic acid] by Sphingomonas herbicidovorans MH, Journal of Bacteriology (1998), 180(13), 3368-3374.
	Cho et al, Agricultural Chemistry and Biotechnology (English Edition) (1999), 42(2), 57-61 , Isolation and characterization of 2-methyl-4-chlorophenoxyacetic acid-degrading bacteria from agricultural soils.
	Lim et al, Journal of Microbiology (Seoul, Republic of Korea) (2004), 42(2), 87-93 Genetic and phenotypic diversity of (R/S)-mecoprop [2-(2-methyl-4-chlorophenoxy)propionic acid]-degrading bacteria isolated from soils.
	Tamura et al, Nippon Noyaku Gakkaishi (2001), 26(3), 309-314 , Microbial pesticide degradations and evolutionary analysis of degrading enzymes.
	Vallaey et al, Biotechnology Letters (1998), 20(11), 1073-1076 , Isolation and characterization of a stable 2,4-dichlorophenoxyacetic acid degrading bacterium, Variovorax paradoxus, using chemostat culture.
	Fukamori and Hausinger, JBC (268)24311(1993), Purification and characterization of 2,4-Dichlorophenoxyacetate/a-ketogutarate dioxygenase.
	Fukamori and Hausinger, J Bacteriology (175)2083(1993), Alcaligenes eutrophus JMP134 "2,4-Dichlorophenoxyacetate monooxygenase" is an a-Ketoglutarate-dependent dioxygenase.
	Ehrig et al., Acta Biotechnologica (17)351-356(1997), Isolation of phenoxyherbicidedegrading Rhodoferax species from contaminated building material.
	Hausinger, Critical Reviews in Biochemistry (39)21-68(2004), Fe(II)/.alpha.-Ketoglutarate-Dependent Hydroxylases and Related Enzymes.
	Hausinger and Fukamori, Env Health Perspectives (103)37-39(1995), Characterization of the first enzyme in 2,4-Dichlorophenoxyacetic acid metabolism.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Don et al., J Bacteriol (161)85(1985), Transposon Mutagenesis and Cloning Analysis of the Pathways for Degradation of 2,4-Dichlorophenoxyacetic Acid and 3-Chlorobenzoate in <i>Alcaligenes eutrophus</i> JMP134(pJP4).
	Don et al., J Bacteriol (161)466(1985), Genetic and Physical Map of the 2,4-Dichlorophenoxyacetic Acid-Degradative Plasmid pJP4.
	Hotopp et al., J. Molec. Catalysis B: Enzymatic (15)155-162(2001), Alternative substrates of 2,4-dichlorophenoxyacetate/-ketoglutarate dioxygenase.
	Park et al, Journal of Microbiology and Biotechnology (2003), 13(2), 243-250 , Isolation and characterization of 4-(2,4-dichlorophenoxy)butyric acid-degrading bacteria from agricultural soils.
	Mueller RH, Babel W. Degradability and recalcitrance of phenoxyalkanoic acid herbicides--traits of the microbial metabolism. In Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds 2000 (pp. 229-236).
	Tett, Biodegradation (1997), 8(1), 43-52 , Biodegradation of the chlorophenoxy herbicide (R)-(+)-mecoprop by <i>Alcaligenes denitrificans</i> .
	Llewellyn et al, Herbicide-Resistant Crops (1996), 159-74, Genetic engineering of crops for tolerance to 2,4-D.
	Baelum et al., Appl. Environ. Microbiol. (72)1476-1486 (2006), Degradation of 4-Chloro-2-Methylphenoxyacetic Acid in Top- and Subsoil is Quantitatively Linked to the Class III <i>tfdA</i> Gene
	Baelum et al., Appl. Environ. Microbiol. (75)2969-2972 (2009), TaqMan Probe-Based Real-Time PCR Assay for Detection and Discrimination of Class I, II, and III <i>tfdA</i> Genes in Soils Treated with Phenoxy Acid Herbicides.
	Griffin et al., J Agric Food Chem (61)6589-6596(2013), Characterization of Aryloxyalkanoate Dioxygenase-12, a Nonheme Fe(II)/ α -Ketoglutarate-Dependent Dioxygenase, Expressed in Transgenic Soybean and <i>Pseudomonas fluorescens</i> .
	Hausinger, RSC Metallobiology (2015) Chapter 1 of 2-Oxoglutarate-dependent oxygenases, Biochemical diversity of 2-oxoglutarate-dependent oxygenases.
	Leibeling et al, Eng Life Sci (13)278(2013), Posttranslational oxidative modification of (R)-2-(2,4-dichlorophenoxy) propionate/ α -ketoglutarate-dependent dioxygenases (RdpA) leads to improved degradation of 2,4-dichlorophenoxyacetate (2,4-D).
	Muller et al., Applied and Environmental Microbiology (72)4853(2006), Purification and Characterization of Two Enantioselective α -Ketoglutarate-Dependent Dioxygenases, RdpA and SdpA, from <i>Sphingomonas herbicidovorans</i> MH.
	Zapras et al, Appl. Environ. Microbiol. (76)119(2010), Abundance of Novel and Diverse <i>tfdA</i> -Like Genes, Encoding Putative Phenoxyalkanoic Acid Herbicide-Degrading Dioxygenases, in Soil.
	Zhang et al. Journal of Agricultural and Food Chemistry (2020), 68(26), 6967-6976 CODEN: JAFCAU; ISSN: 0021-8561 Enantioselective Catabolism of the Two Enantiomers of the Phenoxyalkanoic Acid Herbicide Dichlorprop by <i>Sphingopyxis</i> sp. DBS4.
	Krausse et al., 4th biotechnology symposium of the University of Leipzig (abstract) p. 60 (2005), Crystal structure of the 2-oxoglutarate dependent dioxygenase RdpA.
EXAMINER:	DATE CONSIDERED:

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Mueller et al., Un Mich ICBIC 2005 abstract, Insights into the enantiospecificities of (R)- and (S)-dichlorprop/a-ketoglutarate dioxygenases.
	Krausse et al., Freiberg Un Deutschen Gesellschaft fur Kristallographie (2006), (Poster title 72L) Structure of the 2-Oxoglutarate Dependent Dioxygenase RdpA by X-ray Crystallography and Small Angle X-ray Scattering.
	Gazitua et al., Environ Microbiol (12)2411(2010), Novel .alpha.-ketoglutarate dioxygenase tfdA-related genes are found in soil DNA after exposure to phenoxyalkanoic herbicides.
	Chekan et al., Proceedings of the National Academy of Sciences (116)13299-13304(2019), Molecular basis for enantioselective herbicide degradation imparted by aryloxyalkanoate dioxygenases in transgenic plants.
	Larue et al, Pest Manag Sci (75)2086(2019), Development of enzymes for robust aryloxyphenoxypionate and synthetic auxin herbicide tolerance traits in maize and soybean crops.
	Liu et al., FEMS Microbiol Ecol (86)114-129(2013) , Consumers of 4-chloro-2-methylpheoxyacetic acid from agricultural soil and drilosphere harbor cadA, r/sdpA, and tfdA-like gene encoding oxygenases.
	Muller et al., Protein Science (15)prot1356(2006), Structural basis for the enantiospecificities of R- and S-specific phenoxypropionate/a-ketoglutarate dioxygenases.
	Muller, Eng Life Sci (7)311-321 (2007), Activity and Reaction Mechanism of the Initial Enzymatic Step Specifying the Microbial Degradation of 2,4-Dichlorophenoxyacetate.
	Westendorf, Eng Life Sci (6)552-559(2006), Kinetic Traits and Enzyme Form Patterns of (R)-2-(2,4-Dichlorophenoxy) propionate/a-Ketoglutarate Dioxygenase (RdpA) after Expression in Different Bacterial Strains.
	Wright et al., Proc Natl Acad Sci (107)20240(2010), Robust crop resistance to broadleaf and grass herbicides provided by aryloxyalkanoate dioxygenase transgenes.
	GenBank accession No. AAA21983.1 tfdA Cupriavidus necator (replaced Ralstonia eutropha), Apr. 23, 1993.
	GenBank accession No. AAK81681.1 tfdA Burkholderia cepacia, Aug. 24, 2020, Jul. 23, 2016.
	UniProtKB accession No. Q45423.1 tfdA Burkholderia sp. RASC, Nov. 1, 1996.
	GenBank accession No. AAS49436 tfdA Achromobacter denitrificans, Apr. 3, 2020.
	GenBank accession No. AAB47567.1 tfdABurkholderia cepacia pIJB, Jul. 26, 2016.
	GenBank accession No. AAM76772.1 tfdADelftia acidovorans _-287 aaProtein _-NCBI Jul. 26, 2016.
	GenBank accession No. BAB92965.1 tfdA alpha proteobacterium HWK12, Jul. 2, 2002.
	GenBank accession No. BAB92966.1 tfdA alpha proteobacterium HW13, Jul. 2, 2002.
	NCBI accession No. WP_011084309.1 tfdA Bradyrhizobium diazoefficiens (replaced B. japonicum), Jul. 27, 2019.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	UniProtKB accession No. P83309.2 sdpA MC1 Delftia aciovorans, Sep. 18, 2019.
	UniProtKB accession No. Q700X4.1 sdpA MH Shingobium herbicidovorans, Nov. 1, 1996.
	GenBank accession No. ABD67501.1 sdpA P230 Rhodoferax sp. P230, Mar. 14, 2006.
	Muller, Swiss Federal Institute of Technology thesis (Nov. 2004), Metabolism of phenoxyalkanoic acid herbicides in Sphingomonas herbicidovorans MH cloning and characterization of two enantiospecific .alpha.-ketoglutarate-dependent dioxygenases and degradation pathway analysis.
	Westendorf Universitat Leipzig thesis-German (2005), Enantioselektive Verwertung von Phenoxyalkanoat-Herbiziden durch Bakterien--Eine Charakterisierung der Dioxygenasen des initialen Abbau-Schrittes.
	Baelum et al., System Appl Microbiol. (33)67(2010), Supplemental Material to Comparison of 16S rRNA gene phylogeny and functional tfdA gene distribution in thirty-one different 2, 4-dichlorophenoxyacetic acid and 4-chloro-2-methylphenoxyacetic acid degraders.
	Han et al, World Journal of Microbiology & Biotechnology (2014), 30(10)2567-2576 , 16S rRNA gene phylogeny and tfdA gene analysis of 2,4-D-degrading bacteria isolated in China.
	Zhang et al., J. Agric. Food Chem. (58)12878(2010), Enantioselective Environmental Behavior of the Chiral Herbicide Fenoxaprop-ethyl and Its Chiral Metabolite Fenoxaprop in Soil.
	Wu et al., J. Agric. Food Chem. (65)3711(2017), Rapid Biodegradation of the Herbicide 2,4-Dichlorophenoxyacetic Acid by Cupriavidus gilardii T-1.
	Zabaloy et al., Ann Microbiol (64)969(2014), Isolation and characterization of indigenous 2,4-D herbicide degrading bacteria from an agricultural soil in proximity of Sauce Grande River, Argentina.
	Nielsen et al., PLOS One 8(12)e83346(2013), Novel Insight into the Genetic Context of the cadAB Genes from a 4-chloro-2-methylphenoxyacetic Acid-Degrading Sphingomonas.
	Mierzejewska et al, Bulletin Env Contam Tox (104)200(2020), Biodegradation Potential and Ecotoxicity Assessment in Soil Extracts Amended with Phenoxy Acid Herbicide (2,4-D) and a Structurally-Similar Plant Secondary Metabolite (Ferulic Acid).
	Shimojo et al., J Biosc Bioengin. (108)56(2009), Analysis of genes encoding the 2,4-dichlorophenoxyacetic acid degrading enzyme from Sphingomonas agrestis 58-1.
	Han et al, World Journal of Microbiology & Biotechnology (2015), 31(7), 1021-1030 , Cloning, expression, characterization and mutational analysis of the tfdA gene from Cupriavidus campinensis BJ71.
	Paulin et al., Environ Microbiol (13)1513-1523(2011), (R,S)-dichloroprop herbicide in agricultural soil induces proliferation and expression of multiple dioxygenase-encoding genes in the indigenous.
	Muller et al., Protein Science (15)prot1356(2006), Supplemental Table and Figures to Structural basis for the enantiospecificities of R- and S-specific phenoxypropionate/a-ketoglutarate dioxygenases.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	GenBank accession No. BAB92964.1 tfdAa alpha proteobacterium RD5-C2--NCBI. Jul. 2, 2002.
	Poh et al., 2,4-Dichlorophenoxyacetate / .alpha.-ketoglutarate dioxygenases from Burkholderia cepacia 2a and Ralstonia eutropha JMP134, Microbios 105 43-63 2001.
	Suwa et al., Characterization of a chromosomally encoded 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase from Burkholderia sp. strain RASC, Applied and Environmental Microbiology (1996), 62(7), 2464-2469.
	Itoh et al., tfdA-like genes in 2,4-dichlorophenoxyacetic acid-degrading bacteria belonging to the Bradyrhizobium-Agromonas-Nitrobacter-Afipia cluster in Proteobacteria, Applied and Environmental Microbiology (2002), 68(7), 3449-3454.
	Vedler et al. The Completely Sequenced Plasmid pEST4011 Contains a Novel IncP1 Backbone and a Catabolic Transposon Harboring tfd Genes for 2,4-Dichlorophenoxyacetic Acid Degradation, Journal of Bacteriology, vol. 186, No. 21, Nov. 2004, p. 7161-7174.
	Hoffmann et al., Development and application of PCR primers for the detection of the lid genes in Delftia acidovorans P4a involved in the degradation of 2,4-D, Acta Biotechnologica (2001), 21(4), 321-331.
	Itoh et al., Root nodule Bradyrhizobium spp. harbor tfdA and cadA, homologous with genes encoding 2,4-dichlorophenoxyacetic acid-degrading proteins, Applied and Environmental Microbiology (2004), 70(4), 2110-2118.
	Kaneko et al., Complete Genomic Sequence of Nitrogen-fixing Symbiotic Bacterium Bradyrhizobium japonicum USDA110 (Supplement). DNA Research 9,--Supplement, 225-256 (2002).
	Muller et al., Genetic Analysis of Phenoxyalkanoic Acid Degradation in Sphingomonas herbicidovorans MH; Applied and Environmental Microbiology, Oct. 2004, vol. 70, No. 10, p. 6066-6075.
	Muller et al., Physiological and genetic characteristics of two bacterial strains utilizing phenoxypropionate and phenoxyacetate herbicides, Microbiological Research (2001), 156(2), 121-131.
	Eichhorn Eric et al: "Characterization of alpha-ketoglutarate-dependent taurine dioxygenase from Escherichia coli", Journal of Biological Chemistry, vol. 272, No. 37, 1997, pp. 23031-23036, ISSN: 0021-9258.
	Bisht Na Veen Chandra et al: "Development of 2,4-O-resistant transgenics in Indian oilseed mustard (Brassica juncea)", Current Science (Bangalore), vol. 87, No. 3, Aug. 10, 2004 (Aug. 10, 2004), pp. 367-370, ISSN: 0011-3891.
	Opposition filed against EP 10012200.1, filed on Dec. 20, 2013.
	Opposition filed against EP 10012201.9, filed on Dec. 6, 2013.
	Opposition filed against EP 10012202.7, filed on Dec. 20, 2013.
	Opposition filed against EP 10012199.5, filed on Jun. 18, 2014.

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Molecular Cloning, a Laboratory Manual, Cold Spring Harbor Laboratory Press, Second Edition., 1989, vol. 2, p. 11.45.
	Applicant Response to Opposition filed against EP 10012200.1, filed on Aug. 8, 2014.
	Applicant Response to Opposition filed against EP 10012201.9, filed on Jul. 28, 2014.
	Applicant Response to Opposition filed against EP 10012202.7, filed on Jul. 28, 2014.
	Applicant Response to Opposition filed against EP 10012199.5, filed on Nov. 22, 2014.
	Final Decision in Opposition filed against EP 10012200.1, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012201.9, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012202.7, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012199.5, dated Feb. 9, 2016.
	Kohler, Genbank Accession No. AJ628859, March 2004

EXAMINER:	DATE CONSIDERED:
-----------	------------------

Electronic Patent Application Fee Transmittal

Application Number:	15468494			
Filing Date:	24-Mar-2017			
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES			
First Named Inventor/Applicant Name:	Terry R. WRIGHT			
Filer:	John P. Breen			
Attorney Docket Number:	14764-262737			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	260	260
Total in USD (\$)				260

Electronic Acknowledgement Receipt

EFS ID:	44416284
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:43:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$260
RAM confirmation Number	E2021B2I45031159
Deposit Account	100435
Authorized User	John Breen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	CN1471533.pdf	7626758	no	35
			55e49ea79a1047a6ede035d447ad452713808079		
Warnings:					
Information:					
2	Foreign Reference	EP1025250.pdf	16039990	no	90
			cfbe5880d5ba47dbd14e2eb87b52cc2248ea1c79		
Warnings:					
Information:					
3	Foreign Reference	EP1167531.pdf	4727758	no	25
			727e71317d1d15b1b5c597b72e1f5cf045cdf5b92		
Warnings:					
Information:					
4	Foreign Reference	EP1695983B1.pdf	1485288	no	41
			bbd39d5c48062b65a75c018c58efdab3e147ac61		
Warnings:					
Information:					
5	Foreign Reference	EP1740039B1.pdf	5443992	no	152
			8916f0b907e5aa27ef8fd1525e8e5c73435339f8		
Warnings:					
Information:					
6	Foreign Reference	W03-013224.pdf	8724539	no	54
			076dc4699c77d3b54598c977b4be8691293f304f		
Warnings:					
Information:					

7	Foreign Reference	WO199-063092.pdf	10215444	no	56
			6de5d31e2f003e74a3754da469ad844479b4c1af		
Warnings:					
Information:					
8	Foreign Reference	WO200-006757.pdf	6784904	no	38
			d157fdda6d3a2ddedb1d12d279585df2d9bc1294		
Warnings:					
Information:					
9	Foreign Reference	WO2001-038513.pdf	16933920	no	86
			ab30227b612c8e9a6cdabca260f30bc9e1254509		
Warnings:					
Information:					
10	Foreign Reference	WO2003-056904.pdf	15508170	no	76
			e28e42e33e1b3bbb66021fee6c3de65804060eb0		
Warnings:					
Information:					
11	Foreign Reference	WO0009727.pdf	1427913	no	7
			5c087e4de47379e154b52fbc1abf77fe838974ed		
Warnings:					
Information:					
12	Information Disclosure Statement (IDS) Form (SB08)	Supp_IDS.pdf	129546	no	15
			1707e441cca7c9a12a6435356680028e361b3606		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
13	Fee Worksheet (SB06)	fee-info.pdf	37965	no	2
			0d47683c65f18f228f518652d8229304caa2cf20		
Warnings:					
Information:					
Total Files Size (in bytes):			95086187		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	44417214
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:48:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	de_Lipthay_Enhanced_degradation.pdf	408884 578f39bd5f16b73288e326a79a20e544cdd3e45b	no	10

Warnings:

Information:					
2	Non Patent Literature	de_Lipthay_Expression.pdf	535186	no	10
			7d4f61703e4b9ab7b2dec6ededc1d46892fd2e15		
Warnings:					
Information:					
3	Non Patent Literature	de_Lipthay_In_situ.pdf	210761	no	7
			a48cff6fb0e1e592ef25fc3669ff24c177d9307e		
Warnings:					
Information:					
4	Non Patent Literature	Don_Genetic.pdf	517439	no	4
			44c1b86f2561820bb225eb277316dd5970332b0a		
Warnings:					
Information:					
5	Non Patent Literature	Don_Transposon.pdf	1095941	no	7
			2d66be80380dc165fa5a1236dbd9472bc2156f86		
Warnings:					
Information:					
6	Non Patent Literature	Eichhorn_et_al.pdf	3512345	no	6
			16f305c2c08e33c75817daefc5ba7db0b5506f2a		
Warnings:					
Information:					
7	Non Patent Literature	Feng_Biodegradation.pdf	327767	no	7
			841884e89d44492a146669770647c29f97beaf6a		
Warnings:					
Information:					
8	Non Patent Literature	Final_Decision_EP100122027.pdf	1527464	no	18
			55fa7389e15e810c458e1d16a412bf29739ec092		
Warnings:					
Information:					

9	Non Patent Literature	Final_Decision_EP_100121995.pdf	501485 8b7c34da1313682e8a9ce674c2971892e4b3fcd	no	6
Warnings:					
Information:					
10	Non Patent Literature	Final_Decision_EP_100122019.pdf	1480681 d81cab0f47c091e177eecef9a97067122aa6c2d7	no	17
Warnings:					
Information:					
11	Non Patent Literature	FinalDecisionEP100122001.pdf	1674609 a0f0a38c9ae0557caa8ff2b5216928a5ea2abbe5	no	20
Warnings:					
Information:					
Total Files Size (in bytes):			11792562		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44417326
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:49:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Fuechslin_Effect.pdf	256304	no	10
			1cf34b2220e0bf412324f43a7601559a3572d3c		

Warnings:

Information:					
2	Non Patent Literature	Fukamori_and_Hausinger_PURIFICATION.pdf	1933909	no	7
			6da7f2d030722f71ad5e6f2e20c62e8a17696354		
Warnings:					
Information:					
3	Non Patent Literature	Gazitua.pdf	792040	no	15
			ba1bb57d84dbb77e81d341fc226f377129500903		
Warnings:					
Information:					
4	Non Patent Literature	Fukamori_Alkaligenes.pdf	743479	no	4
			285351f606cb96a1644da93a189fd5847e290c51		
Warnings:					
Information:					
5	Non Patent Literature	Genbank_M16730.pdf	22799	no	2
			7bef99a6a021f57d839ac8479b766076bdfa4900		
Warnings:					
Information:					
6	Non Patent Literature	GenBank_AJ628859.pdf	26877	no	3
			5445b94e7b2ffa2800f0f286fb9e12b9c7a311a0		
Warnings:					
Information:					
7	Non Patent Literature	Griffin_Characterization.pdf	231057	no	8
			e85303be85ea569df429677004a25538d7a1d57b		
Warnings:					
Information:					
8	Non Patent Literature	Han_Cloning_Expression.pdf	679370	no	10
			332a4133957bf6f3cf3dfc4aa521543d8acdc62f		
Warnings:					
Information:					

9	Non Patent Literature	Han_World_Journal.pdf	449911 0e53db86d95d3517ea89583848f828e1d9f0ac16	no	10
Warnings:					
Information:					
10	Non Patent Literature	Harker_Phenoxyacetic.pdf	1454971 0333c05479947c354574545d833ec732b7d6a066	no	7
Warnings:					
Information:					
11	Non Patent Literature	Hausinger_Biochemical_diversity.pdf	1125232 dd1c3638a2dc26d2e07e6213ed69c308210dc5a7	no	58
Warnings:					
Information:					
12	Non Patent Literature	Hausinger_Characterization.pdf	570979 b3e0d1f497b0a158c5feb0752c28ad4d1d2cc49	no	3
Warnings:					
Information:					
Total Files Size (in bytes):			8286928		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44417518
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:49:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Hawkins.pdf	500664	no	5
			2752cbbe4ea3f56103fe4f126aa9dd2f28c1942c		

Warnings:

Information:					
2	Non Patent Literature	Hoffmann.pdf	407507	no	11
			4d046ac84e59ab2f6efbc92a039311b9ab220b64		
Warnings:					
Information:					
3	Non Patent Literature	Hoffmann_A_transposon.pdf	241692	no	12
			9e38b8ca8484fa1818fcec979063e9b1086945b0b		
Warnings:					
Information:					
4	Non Patent Literature	Hogan_Distribution.pdf	293326	no	7
			a86e836ba90448d609e87fdc3a00fdd4a1895e19		
Warnings:					
Information:					
5	Non Patent Literature	Hogan_et_al_Site-directed_Mutagenesis.pdf	10026331	no	10
			b1fe019fdd06ecdcbaa820fc1415f4e0eb64c74		
Warnings:					
Information:					
6	Non Patent Literature	Hogan_Site-directed.pdf	408901	no	11
			e48b3072c54f36a3df35463329733fa7ce517658		
Warnings:					
Information:					
7	Non Patent Literature	Horvath_abstract.pdf	18125	no	1
			9452eb7e327b4e05a4d3d5537d587ae516d9f8c8		
Warnings:					
Information:					
8	Non Patent Literature	Itoh_Root_nodule.pdf	364458	no	9
			3ea8a4ab21aa82df7f7d08da1a240aed8e9a0ebf		
Warnings:					
Information:					

9	Non Patent Literature	Itoh_tfdA-like_genes.pdf	1031118 c3271dcaa860859ac7b8f09834b3be3339b1fa28	no	6
Warnings:					
Information:					
10	Non Patent Literature	j_molec_catalysis_15_p155-162_2001_Hotopp-tfda_alterate_substrates.pdf	216503 427ea2fc370a5438a701755524187ef1e65298af	no	8
Warnings:					
Information:					
11	Non Patent Literature	Jackman_Electrokinetic.pdf	400498 ea1b8e07d24e7a51d59bfe4bd2f5b4329eabd272	no	10
Warnings:					
Information:					
Total Files Size (in bytes):			13909123		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44417739
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:51:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Laemmli.pdf	456697	no	10
			573806d0af0810d5d376fb409d6ce4571f4824f8		

Warnings:

Information:					
2	Non Patent Literature	Larue_Development.pdf	374988	no	9
			2a37a0465168152e8065e2a18a1ffdd7877123d0		
Warnings:					
Information:					
3	Non Patent Literature	Laurent.pdf	417927	no	5
			6d063237c8b793a8d7b1a805bce98bf46527613c		
Warnings:					
Information:					
4	Non Patent Literature	Leibeling_Posttranslational.pdf	1033709	no	14
			3788e92c6fc8af500fba4a53e7092195a42ad54e		
Warnings:					
Information:					
5	Non Patent Literature	Lim_Genetic.pdf	667500	no	7
			5d3325b809a4f840e8b5a1afb6b51f944c88a964		
Warnings:					
Information:					
6	Non Patent Literature	Liu_Consumers.pdf	267864	no	16
			527af1a85a15103fd1263f36a74f9e4b637b6983		
Warnings:					
Information:					
7	Non Patent Literature	Llewellyn.pdf	1215712	no	16
			a1faedd58863bf19875823cade980e2f727f6bda		
Warnings:					
Information:					
8	Non Patent Literature	Loos.pdf	338446	no	3
			ad1ae2a2a4771dbc46d6b8a75c61120b6fa8416e		
Warnings:					
Information:					

9	Non Patent Literature	Ludwig.pdf	241361 cdec5c4d3c5a917b183847cffe1ca1cb329ac e39	no	7
Warnings:					
Information:					
10	Non Patent Literature	Lyon_Cotton.pdf	794983 c514491d348fee56adeaf78d7fde85e6972 664b	no	8
Warnings:					
Information:					
11	Non Patent Literature	Lyon_Expression.pdf	629278 63e37c0ff6bdc280382c6f1a8aeea6e844f37 537	no	8
Warnings:					
Information:					
12	Non Patent Literature	Mae.pdf	683860 f7c971b6168b7adb48aebbc72a56719a817 ba5e7	no	6
Warnings:					
Information:					
Total Files Size (in bytes):			7122325		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44417619
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:50:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	JP_2005-287415.pdf	3012547	no	18
			9405a472cae2ef8386e6d4f910900089fb111245		

Warnings:

Information:					
2	Non Patent Literature	Ka_Integration.pdf	4547509	no	6
			b4e24701febaf01c9af83df02ef812f0b84b3c1b		
Warnings:					
Information:					
3	Non Patent Literature	Ka_Use_of_Gene_Probes.pdf	3038416	no	5
			63927a59b42f07991fcd01a2ff824a5853f14df9		
Warnings:					
Information:					
4	Non Patent Literature	Kaneko.pdf	301104	no	9
			0ee0aa3a1a1eaa010c3605201286c127077e1948		
Warnings:					
Information:					
5	Non Patent Literature	Kitagawa_Novel.pdf	469630	no	10
			cbb6a626c9e57d32ea264333855d9fdf3dad210		
Warnings:					
Information:					
6	Non Patent Literature	Kleinsteuber.pdf	192892	no	10
			ae216f155513fec111690bd64d672991a5e080f		
Warnings:					
Information:					
7	Non Patent Literature	kohler.pdf	193976	no	8
			f0ad5b1f7ba814c1e074b1028ea26d80db816d29		
Warnings:					
Information:					
8	Non Patent Literature	Kohler_Sphingomonas.pdf	1468107	no	5
			3f189d83018f17d65abbf9357dcc8312886ffbb9		
Warnings:					
Information:					

9	Non Patent Literature	Kohler1999_Article_SphingomonasHerbicidovoransMHA.pdf	290766	no	5
			2a8f5d35476801f8c168e4eca1d2a2a544566c8a		
Warnings:					
Information:					
10	Non Patent Literature	Krausse_4th_Biotech_Symposium.pdf	2485337	no	234
			94478a8748b63d53dd0b16c97e2c772f25347b97		
Warnings:					
Information:					
11	Non Patent Literature	Krausse_poster.pdf	6265782	no	44
			238255bc4d7086314595f2aba5f3bfd9b86bede5		
Warnings:					
Information:					
Total Files Size (in bytes):			22266066		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44417839
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:52:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Maltseva.pdf	1055193	no	8
			a9aa83cf0f0d97e3a8bca863f0910ca7baed d150		

Warnings:

Information:					
2	Non Patent Literature	Marriott.pdf	205008	no	5
			3d41e3dea547bf360fc68a482c71e9203e21ade9		
Warnings:					
Information:					
3	Non Patent Literature	Matheson_Evidence.pdf	326366	no	7
			19cd78cf9796daa1a1cda2934005756e05db0110		
Warnings:					
Information:					
4	Non Patent Literature	McGowan.pdf	130083	no	4
			f81afade5ec51b5c1c20b3ec91cc1393056cdc24		
Warnings:					
Information:					
5	Non Patent Literature	Mierzejewska_Biodegradation_potential.pdf	142774	no	6
			18d88adc8067b0de286f92ff119f3d4b171b301		
Warnings:					
Information:					
6	Non Patent Literature	Molecular_Cloning_laborartory_manual.pdf	433225	no	3
			9240f0483e22f5e2a5407df7ab3b7c4ed5ceb9fd		
Warnings:					
Information:					
7	Non Patent Literature	Mueller_Insights.pdf	79370	no	1
			76c7337654f6f3cfd45092df288f3e8c8d90ff4d		
Warnings:					
Information:					
8	Non Patent Literature	Mueller_Structural_basis.pdf	454351	no	13
			ed665f03c933c0c61bca098a06501ec77224af6aa		
Warnings:					
Information:					

9	Non Patent Literature	Mueller_SupplMaterials.pdf	238242 c6cb7817f44b2c3f4f055cbd26ae2be9cbe620ae	no	5
Warnings:					
Information:					
10	Non Patent Literature	Muller_Activity_and_reaction.pdf	557476 033ac54db8e5d377b7e1a8a345fed51bbc99159f	no	11
Warnings:					
Information:					
11	Non Patent Literature	Muller_Comamonas.pdf	5842254 fd95749e9db884469b7454b274a15f8a7473d2fb	no	6
Warnings:					
Information:					
12	Non Patent Literature	Muller_Degradability.pdf	2487522 4c1ac7d099f756d66b76c0d7c6f43130cd265279	no	9
Warnings:					
Information:					
Total Files Size (in bytes):			11951864		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44418008
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:53:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Muller_Genetic_analysis.pdf	234156	no	10
			8f2db89fa46ba76e25c114e44a6c2c6c1d8d00c		

Warnings:

Information:					
2	Non Patent Literature	Muller_Physiological.pdf	224806	no	11
			e3962963140aaf4fd7e8421376f7143d7dc11e15		
Warnings:					
Information:					
3	Non Patent Literature	Muller_Pseudo.pdf	268197	no	16
			6da514c9c8913feb678754c51848066b082083a3		
Warnings:					
Information:					
4	Non Patent Literature	Muller_Purification.pdf	1444599	no	10
			9f64186d8d3ed69dcdf298aa82f87b228a08f5cc		
Warnings:					
Information:					
5	Non Patent Literature	Muller_Separation.pdf	414010	no	7
			0f5f8e4cd3fd98513afa5942739f3fb7224498f6		
Warnings:					
Information:					
6	Non Patent Literature	Muller_Thesis.pdf	1844655	no	182
			28c640f08947e372a4746f5f71977112b91be223f		
Warnings:					
Information:					
7	Non Patent Literature	Nickel.pdf	146740	no	6
			9b05b58657657e978169340846844268433a5b1f		
Warnings:					
Information:					
8	Non Patent Literature	Nielsen_Novel_insight.pdf	507972	no	9
			f4983e9c7effec23973a2bbbab40c78453f8fd94		
Warnings:					
Information:					
Total Files Size (in bytes):			5085135		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	44418438
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:56:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Nippon_Noyaku_Gakkaishi_2001_Tamura_Japanese.pdf	2938918	no	9
			417ab2c96c1f86f9904791dceccaa885d5226d43		

Warnings:

Information:					
2	Non Patent Literature	Ohkouchi.pdf	1724099	no	7
			aad4e0ea7bcc6a74dfe27c3f9c42673b90832784		
Warnings:					
Information:					
			Total Files Size (in bytes):		
			4663017		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44418174
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:56:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Opposition_filed_against_EP_10012199_5.pdf	1070125 e0575a8671f60dfb09ef14a7c74bcb23eaaa4747	no	18

Warnings:

Information:					
2	Non Patent Literature	OppositionFiledAgainstEP_10012200_1.pdf	1142920	no	18
			28d71545557f860b75317cf2d1ede3bc78ba99fc		
Warnings:					
Information:					
3	Non Patent Literature	Travkin.pdf	168073	no	10
			8eba3788bc259c629c32b89907a5fe94430c14ba		
Warnings:					
Information:					
Total Files Size (in bytes):			2381118		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44418524
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:57:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Opposition_filed_against_EP_10012201_9.pdf	1101631 d85db08cc2fa34874405f6665ad7a36e81e977e9	no	20

Warnings:

Information:					
2	Non Patent Literature	Opposition_filed_against_EP_10012202_7.pdf	931411	no	18
			a1e8ca1bbf9a50b11ce012b77d501f464b64f5e1		
Warnings:					
Information:					
3	Non Patent Literature	Park_Isolation.pdf	529400	no	8
			405670535d003fc74f3973c684084a91decf5cda		
Warnings:					
Information:					
4	Non Patent Literature	Parker_Kinetics.pdf	498741	no	6
			3d17aad5c383a18485fabf2e9b77f4fea57f0f6c		
Warnings:					
Information:					
5	Non Patent Literature	Paulin_R_S-Dichlroprop.pdf	404492	no	11
			2e1f846ceb9bcf9378d853e9865914713dc944ac		
Warnings:					
Information:					
6	Non Patent Literature	Perkins.pdf	1279394	no	7
			a54783e042a7215836f96d481262a08625a5c998		
Warnings:					
Information:					
7	Non Patent Literature	Plumeier_Importance.pdf	233405	no	11
			58e6256a0d10765f234f0048bb617832c21184d0		
Warnings:					
Information:					
8	Non Patent Literature	Poh.pdf	2571806	no	21
			90bdbf46037561c6b098bd054c8dbb379aff0cfdc		
Warnings:					
Information:					

9	Non Patent Literature	Poh_Complete.pdf	155435	no	12
			4dc74440544c54ecb6e6c44b7d0edaebf8a5331		
Warnings:					
Information:					
10	Non Patent Literature	Preston_Multiple.pdf	246261	no	12
			79cd82cee9cd314c7a77c1f408e566c5b415d451		
Warnings:					
Information:					
11	Non Patent Literature	prot_sci_15_1356_2006_Mueller.pdf	478329	no	13
			3f2435491eb29027f3e254e6036165b3298c4cae		
Warnings:					
Information:					
12	Non Patent Literature	Response_to_Opposition_EP_10012200_1.pdf	1559108	no	19
			2fa4440dc8612896c96ecd763e264a9aa25073e		
Warnings:					
Information:					
13	Non Patent Literature	Response_to_Opposition_EP_10012201_9.pdf	1388431	no	17
			eb9d712728329bb737193e28084d15124c368c4b		
Warnings:					
Information:					
Total Files Size (in bytes):			11377844		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	44418616
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:57:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Response_to_Opposition_filed _against_EP_10012199_5.pdf	1382584 6a299c638f5e8ae11e996919081f6c765edd ada7	no	17

Warnings:

Information:					
2	Non Patent Literature	Response_to_Opposition_filed_against_EP_10012202_7.pdf	2157453	no	26
			1fae54e8dfc24e3bf1720920d4b7575156bcd3479		
Warnings:					
Information:					
3	Non Patent Literature	Saari.pdf	338362	no	8
			73b907e3ef7fda9e090ee9cb02b7f23605d567ec		
Warnings:					
Information:					
4	Non Patent Literature	SCHLEINITZ_Applied_and_Environmental_Microbiology-2004-Schleinitz-5357_full.pdf	1018512	no	10
			e2de2d3c838083dc9fd2400f7ef91289dd9ca1fc		
Warnings:					
Information:					
5	Non Patent Literature	SCHNEIDERHEINZE.pdf	157650	no	8
			2f0d84bf93139fe00c39dca25439e6d6447fba3e		
Warnings:					
Information:					
6	Non Patent Literature	Shaw.pdf	418203	no	9
			362f1c919d37ed84eeba6a0c93a7fd67f662571e		
Warnings:					
Information:					
7	Non Patent Literature	Shimojo_Analysis.pdf	419601	no	4
			fb8daddc2794f4219f4ccfd56c6fd99667b8ad97		
Warnings:					
Information:					
8	Non Patent Literature	Smejkal.pdf	247760	no	7
			de6320468f20ba2e1fbc8e3f316f729ac8077723		
Warnings:					
Information:					

9	Non Patent Literature	Spencer_Abstract.pdf	88710 a0116093eae5d2daf05b86e9b2a86533fb16557e	no	1
Warnings:					
Information:					
10	Non Patent Literature	Streber.pdf	4429604 aa8547c7f602c5c41026cb5ddb949dc19e5ef8e6	no	6
Warnings:					
Information:					
11	Non Patent Literature	Streber_Transgenic_tobacco.pdf	1529677 670954e57ca902f0365dbcb693f974ad55e1ef33c	no	6
Warnings:					
Information:					
12	Non Patent Literature	Suwa.pdf	186059 1cb461f94c898f4298d57013a3eb5fe73fbd94ce	no	6
Warnings:					
Information:					
Total Files Size (in bytes):			12374175		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44418720
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:58:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Tett_Biodegradation.pdf	284390	no	10
			34adf5de43d582f121d5666a0d5cd8e04797da3d		

Warnings:

Information:					
2	Non Patent Literature	Tett_Enantioselective.pdf	683145	no	9
			35b2da8ef8f0ba58543e2518a1d6b70ce46039be		
Warnings:					
Information:					
3	Non Patent Literature	Top_Capture.pdf	274965	no	7
			44134c7515271c37ff3c0e71ee8140fccca10ded0		
Warnings:					
Information:					
4	Non Patent Literature	Top_Methane.pdf	299279	no	11
			d547e09444ec1edb9d877b8aa4ab6dc91c4a67f5		
Warnings:					
Information:					
5	Non Patent Literature	uniprot_P83309.pdf	150997	no	3
			117d4a835ad134d76a84ba4b8a57e6a547ff702d9		
Warnings:					
Information:					
6	Non Patent Literature	Uniprot_Q8KSC8.pdf	234378	no	5
			33f7b25cd3ae5604273381502b77d45288e6153e		
Warnings:					
Information:					
7	Non Patent Literature	Uniprot_Q700X4.pdf	177926	no	4
			e95c1eeeb9c230e0101cb80ece88d5d49fe084ec		
Warnings:					
Information:					
8	Non Patent Literature	Uniprot_Q45423.pdf	76476	no	2
			388805db7febcb0a2f150613d197a482087bb3587		
Warnings:					
Information:					

9	Non Patent Literature	Vallaey's_Metabolic.pdf	836548 5ed72f3bce2f2d4f335018c9d72d3031df34bf1f	no	10
Warnings:					
Information:					
10	Non Patent Literature	Vallaey's_PCR-RFLP.pdf	3499427 77d142e2a36b6ce2cc847c9d2882ee70e88e7965	no	10
Warnings:					
Information:					
11	Non Patent Literature	Vedler_Completely_sequenced.pdf	445735 9dff64e6744f58ed196a0dcae3e0385881a0e573	no	14
Warnings:					
Information:					
12	Non Patent Literature	Vedler_Analysis.pdf	219268 6f97aad220d6d8c70c94ee7aa2ff15c88daa8025	no	8
Warnings:					
Information:					
Total Files Size (in bytes):			7182534		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Electronic Acknowledgement Receipt

EFS ID:	44418849
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:58:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	Vedler_TfdR.pdf	312543	no	8
			fde2a71350f4a35e0022682a2c37271d0328f6f9		

Warnings:

Information:					
2	Non Patent Literature	Westendorf_Dissertation.pdf	7412066	no	122
			962f74117b6b37a6a320dacc47898b95611af01d		
Warnings:					
Information:					
3	Non Patent Literature	Westendorf_Kinetic_traits.pdf	220653	no	8
			39fd16881ec1244751e4f7ef9ecea6e24fbee0c12		
Warnings:					
Information:					
4	Non Patent Literature	Westendorf_The_two_enantiomerspecific.pdf	140777	no	6
			95fe6487172f5b8605923665493f6ceb28081b27		
Warnings:					
Information:					
5	Non Patent Literature	WP011084309.pdf	37718	no	1
			c1d21d10d6ec06f35c9232fcd020a68b4df093a5		
Warnings:					
Information:					
6	Non Patent Literature	Wright_Robust_crop.pdf	250736	no	6
			3f495d19175ef818ab2ed9426574bb9c71a53282		
Warnings:					
Information:					
7	Non Patent Literature	Wu_Rapid_biodegradation.pdf	1745690	no	10
			86a259e493ecf72e02560db71a216a4457ad7d39		
Warnings:					
Information:					
8	Non Patent Literature	Zabaloy_Isolation.pdf	604829	no	9
			1e10cb9fa9379658a0614983f52a16fa8e7555a2		
Warnings:					
Information:					

9	Non Patent Literature	Zaprasis_Abundance.pdf	1513962	no	11
			63c99d291490845990e85780e0da1893c370c780		
Warnings:					
Information:					
10	Non Patent Literature	Zhang_Enantioselective.pdf	834746	no	10
			0efcb86350ff01b763089566b07d2950b4debc75		
Warnings:					
Information:					
11	Non Patent Literature	Zhang_Enantioselective_environmental.pdf	413550	no	7
			9b66cd7a18748348edf6a3f96edd25c3a387305f		
Warnings:					
Information:					
12	Non Patent Literature	Zhang_In_vitro.pdf	63605	no	5
			4b42f8eb01a685607ca0e38769dab25d7968415e		
Warnings:					
Information:					
13	Non Patent Literature	Zipper_Complete.pdf	106309	no	5
			4b60eb4b1eb01550eed604b599e612a58899e263		
Warnings:					
Information:					
14	Non Patent Literature	Zipper_Enantioselective.pdf	149759	no	7
			92ddf77211af1cecd89eff2b208cb780dfc8fec6		
Warnings:					
Information:					
Total Files Size (in bytes):			13806943		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	44416414
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	18:46:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO8705629.pdf	15388968	no	98
			30b32a715378684bf9bba81594708c023114c37		

Warnings:

Information:					
2	Foreign Reference	WO9633270.pdf	23192375	no	107
			e7cf044f099b9278c67f093ff7ab7a86f1042214		
Warnings:					
Information:					
3	Foreign Reference	WO9713402.pdf	19895855	no	118
			5ad1c4f612bf1e174c873c97f3a16c90a2475e54		
Warnings:					
Information:					
4	Foreign Reference	WO-9808963.pdf	18918813	no	112
			7583df56a20980415d491b419a38be3afeeb9aeb		
Warnings:					
Information:					
5	Foreign Reference	WO9820144.pdf	14700312	no	91
			e04fa6a223934ef83f5cda9767b6570ad119e05e		
Warnings:					
Information:					
6	Foreign Reference	WO9832894.pdf	6683269	no	39
			76507b582079b0806623887fe83481bcdfaf3112		
Warnings:					
Information:					
7	Foreign Reference	WO9838336.pdf	16691802	no	97
			6955c88b4d38641edd27b902d2d1fe290fa17210		
Warnings:					
Information:					
8	Foreign Reference	WO9844139.pdf	5980133	no	36
			52af84795a080045e149e92cc42b51639d7b29a2		
Warnings:					
Information:					

9	Foreign Reference	WO9910513.pdf	23076534 1ce315d696ea8c1cf0c66de487b5170a885f190	no	131
Warnings:					
Information:					
10	Foreign Reference	WO1998002562A2.pdf	9006943 e63717c3e64ac12ed2bfb7a2daa28d2c44845124	no	49
Warnings:					
Information:					
11	Foreign Reference	WO2000066748A1.pdf	15521685 c8e214a4117fbfc0faac8c425790493b1ac4030d	no	87
Warnings:					
Information:					
Total Files Size (in bytes):			169056689		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce	
Electronic Petition Request	TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT		
Application Number	15468494		
Filing Date	24-Mar-2017		
First Named Inventor	Terry WRIGHT		
Attorney Docket Number	14764-262737		
Title of Invention	NOVEL HERBICIDE RESISTANCE GENES		
<input checked="" type="checkbox"/> Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action <input checked="" type="checkbox"/> This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.			
Owner		Percent Interest	
CORTEVA AGRISCIENCE LLC		100%	
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 10167483 9944944 8283522 8916752			

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

- ☐ Small Entity
- ☐ Micro Entity
- ☒ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 38833

☐ A sole inventor

☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

☐ A joint inventor; all of whom are signing this request

Signature	/John P Breen/
Name	John P Breen

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	15468494			
Filing Date:	24-Mar-2017			
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES			
First Named Inventor/Applicant Name:	Terry R. WRIGHT			
Filer:	John P. Breen			
Attorney Docket Number:	14764-262737			
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				170

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15468494

Filing Date: 24-Mar-2017

Applicant/Patent under Reexamination: WRIGHT

Electronic Terminal Disclaimer filed on December 2, 2021

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	44424927
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	21:46:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 170
RAM confirmation Number	E2021B2L46082492
Deposit Account	100435
Authorized User	John Breen

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	42572	no	3
			6ad5ec3c89090df9d9bf1dcfb3811178efcd74e		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	37890	no	2
			c7176792c127a1b158e05f4df6ca9b286672788f		

Warnings:

Information:

Total Files Size (in bytes):	80462
-------------------------------------	-------

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt

EFS ID:	44425122
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	02-DEC-2021
Filing Date:	24-MAR-2017
Time Stamp:	22:52:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	Response.pdf	31913	no	2
			3b02e44ddf527c3b0d0dc0c81476a34ef1e25b1		

Warnings:

Information:	
Total Files Size (in bytes):	31913
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

BARNES & THORNBURG LLP

11 South Meridian Street
Indianapolis, Indiana 46204
(317) 236-1313

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Customer No.	107540	}	
		}	
Group:	1663	}	
		}	
Confirmation No.:	6867	}	
		}	
Application No.:	15/468,494	}	
		}	
Invention:	NOVEL HERBICIDE RESISTANCE GENES	}	<u>ELECTRONICALLY FILED ON:</u>
		}	<u>December 2, 2021</u>
		}	
Inventor:	Wright et al.	}	
		}	
Filed:	March 24, 2017	}	
		}	
Attorney Docket:	14764-262737	}	
		}	
Examiner:	David Kruse	}	

AMENDMENT AND RESPONSE UNDER 37 CFR 1.111

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

In response to the Office Action mailed September 3, 2021, Applicant requests consideration of the accompanying remarks. Applicant believes that no fees are required for submission of this response. If any fees are required to affect this filing, the Commissioner is authorized to charge the same to the account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to our file 14764-262737.

No Amendments to the claims are submitted herewith.

Remarks begin on page 2 of this paper.

REMARKS

Claim Rejections

Double Patenting Rejections

Claims 27-55 and 57-60 are rejected for obviousness type double patenting over claims 1-20 of US Patent No 8,916,752. Claims 27-55 and 57-60 are rejected for obviousness type double patenting over claims 1-14 of US Patent No 8,283,522. Claims 27-55 and 57-60 are rejected for obviousness type double patenting over claims 1-6, 11-15 and 19-24 of US Patent no 9,944,944. Claims 27-55 and 57-60 are rejected for obviousness type double patenting over claims 1-25 of US Patent no. 10,167,483.

Applicants have filed terminal disclaimers over each of US Patent Nos. 8,916,752, 8,283,522, 9,944,944 and 10,167,483 and paid the requisite fees, thus rendering the rejections for double patenting moot.

With the entry of the above referenced terminal disclaimers, the application is believed to be in condition for examination and allowance. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Respectfully submitted,

/John P. Breen/

John P. Breen
Attorney Reg. No. 38,833

JPB:gl
Indianapolis, Indiana 46204
317-261-7940

DMS 15088277v1



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

107540 7590 03/01/2022
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

EXAMINER	
KRUSE, DAVID H	
ART UNIT	PAPER NUMBER
1663	

DATE MAILED: 03/01/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867

TITLE OF INVENTION: NOVEL HERBICIDE RESISTANCE GENES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	06/01/2022

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

107540 7590 03/01/2022
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867

TITLE OF INVENTION: NOVEL HERBICIDE RESISTANCE GENES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	06/01/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
KRUSE, DAVID H	1663	800-300000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867
107540	7590	03/01/2022	EXAMINER	
Barnes & Thornburg LLP (Dow)			KRUSE, DAVID H	
11 South Meridian Street			ART UNIT	
Indianapolis, IN 46204			PAPER NUMBER	
			1663	
DATE MAILED: 03/01/2022				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

<i>Notice Requiring Inventor's Oath or Declaration</i>	Application No. 15/468,494	Applicant(s) Terry R. WRIGHT	
	Examiner KRUSE, DAVID H	Art Unit 1663	

This notice is an attachment to the Notice of Allowability (PTOL-37), or the Notice of Allowability For A Design Application (PTOL-37D).

An inventor's oath or declaration in compliance with 37 CFR 1.63 or 1.64 executed by or with respect to each inventor has not yet been submitted.

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor (for any inventor for which a compliant oath, declaration, or substitute statement has not yet been submitted) **MUST** be filed no later than the date on which the issue fee is paid. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application.

A properly executed inventor's oath to declaration has not been received for the following inventor(s):

If applicant previously filed one or more oaths, declarations, or substitute statements, applicant may have received an informational notice regarding deficiencies therein.

The following deficiencies are noted:

INFORMAL ACTION PROBLEMS

- A properly executed inventor's oath or declaration has not been received for the following inventor(s): **Terry R. WRIGHT, Justin M. LIRA, Terence Anthony WALSH, Donald MERLO, Jayakumar Pon SAMUEL, and Gaofeng LIN.**

Applicant may submit the inventor's oath or declaration at any time before the Notice of Allowance and Fee(s) Due, PTOL-85, is mailed.

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulations.

Notice of Allowability	Application No. 15/468,494	Applicant(s) WRIGHT et al.	
	Examiner DAVID H KRUSE	Art Unit 1663	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Response filed 2 December 2021.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 27-55 and 57-60. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. <input type="checkbox"/> Notice of References Cited (PTO-892)	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment
2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>12/2/2021</u> .	6. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance
3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material ____.	7. <input type="checkbox"/> Other ____.
4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. ____.	

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

Examiner's Comment


Terminal Disclaimer

1. The terminal disclaimer filed on 2 December 2021 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patents 10167483 and 9944944 and 8283522 and 8916752 has been reviewed and is accepted. The terminal disclaimer has been recorded.
2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799 and direct fax number (571) 273-0799. The examiner can normally be reached on Monday to Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amjad Abraham can be reached at (571) 270-7058. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/
Primary Examiner, Art Unit 1663

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

CPC - Searched*		
Symbol	Date	Examiner
C12N 9/0071	04/16/2019	/DK/


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.


Search Notes		
Search Notes	Date	Examiner
Inventor Name Search	04/16/2019	/DK/
EAST: USPAT, USPGPUB, EPO, JPO, DERWENT	04/16/2019	/DK/
STN: AGRICOLA, BIOSIS, CAPLUS, EMBASE, CABA	04/16/2019	/DK/
Sequence Search SEQ ID NO: 2	02/01/2019	/DK/
Update EAST	12/16/2019	/DK/
Update EAST	07/17/2020	/DK/
Update EAST	04/27/2021	/DK/
Update EAST	08/30/2021	/DK/
Update EAST	02/14/2022	/DK/
Interference sequence search of SEQ ID NO: 2	02/14/2022	/DK/

/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

<i>Search Notes</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
EAST	EAST	02/14/2022	/DK/


/DAVID H KRUSE/ Primary Examiner, Art Unit 1663	
----------------------------------------------------	--

Issue Classification 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

CPC						
Symbol					Type	Version
C12N	/	15	/	8274	F	2013-01-01
C12N	/	9	/	0071	I	2013-01-01
C12N	/	15	/	8275	I	2013-01-01
C12N	/	9	/	0069	I	2013-01-01
C12Y	/	113	/	11	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Set
	/		/		

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 33	
/DAVID H KRUSE/ Primary Examiner, Art Unit 1663 (Primary Examiner) _____ (Date) _____		14 February 2022 O.G. Print Claim(s) 1	O.G. Print Figure NONE

<i>Issue Classification</i> 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663


INTERNATIONAL CLASSIFICATION			
CLAIMED			
C12N	/	15	/ 82

NON-CLAIMED			
/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner) (Date)		33	
/DAVID H KRUSE/ Primary Examiner, Art Unit 1663		14 February 2022	
(Primary Examiner) (Date)		O.G. Print Claim(s) 1	O.G. Print Figure NONE

Issue Classification 	Application/Control No. 15/468,494	Applicant(s)/Patent Under Reexamination WRIGHT et al.
	Examiner DAVID H KRUSE	Art Unit 1663

☒ Claims renumbered in the same order as presented by applicant
 ☐ CPA
 ☒ T.D.
 ☐ R.1.47

CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19	2	28	11	37	20	46	29	55		
	2		11		20	3	29	12	38	21	47		56		
	3		12		21	4	30	13	39	22	48	30	57		
	4		13		22	5	31	14	40	23	49	31	58		
	5		14		23	6	32	15	41	24	50	32	59		
	6		15		24	7	33	16	42	25	51	33	60		
	7		16		25	8	34	17	43	26	52				
	8		17		26	9	35	18	44	27	53				
	9		18	1	27	10	36	19	45	28	54				

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 33	
/DAVID H KRUSE/ Primary Examiner, Art Unit 1663 (Primary Examiner) _____ (Date) 14 February 2022		O.G. Print Claim(s) 1	O.G. Print Figure NONE

Bibliographic Data

Application No: 15/468,494

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged:

/DAVID H KRUSE/

Examiner's Signature

Initials

Title:

NOVEL HERBICIDE RESISTANCE GENES

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
03/24/2017	800	1663	14764-262737
RULE			

APPLICANTS

DOW AGROSCIENCES LLC, Indianapolis, IN,

INVENTORS

Terry R. WRIGHT, Carmel, IN, UNITED STATES

Justin M. LIRA, Zionsville, IN, UNITED STATES

Terence Anthony WALSH, Zionsville, IN, UNITED STATES

Donald MERLO, Carmel, IN, UNITED STATES

Jayakumar Pon SAMUEL, Carmel, IN, UNITED STATES

Gaofeng LIN, Zionsville, IN, UNITED STATES

CONTINUING DATA

This application is a CON of 14491197 09/19/2014 PAT 10167483

14491197 is a CON of 13647081 10/08/2012 PAT 8916752

13647081 is a CON of 12091896 11/03/2008 PAT 8283522

12091896 is a 371 of PCT/US06/42133 10/27/2006

PCT/US06/42133 has PRO of 60731044 10/28/2005

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

04/17/2017

STATE OR COUNTRY

UNITED STATES

ADDRESS

Barnes & Thornburg LLP (Dow)

11 South Meridian Street

Indianapolis, IN 46204

UNITED STATES
FILING FEE RECEIVED
\$2,560

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	69	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2022/02/14 09:29
L2	3	((("6153401") or ("9127289") or ("20120245339")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2022/02/14 09:29
S1	7	((("8283522") or ("9944944") or ("8916751") or ("8685677") or ("9232803") or ("8916752") or ("10167483")).PN.	USPAT; USOCR	OR	OFF	2019/04/16 13:07
S2	0	"AAD-12.clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S3	0	"AAD-12""'.clm"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S4	663	AAD-12	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S5	50	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/04/16 13:17
S6	52	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/16 09:34
S7	1	("7205561").PN.	USPAT; USOCR	OR	OFF	2019/12/17 15:03
S8	507	Pallett.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06
S9	16	S8 and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:06

S10	0	Kaphammer.in. and herbicide.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08
S11	19	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2019/12/17 15:08
S12	56	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
S13	21	Kaphammer.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2020/07/17 09:18
S14	1	("10167483").PN.	USPAT; USOCR	OR	OFF	2020/07/20 13:36
S15	63	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
S16	9,690	C12N9/0071.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:58
S17	120	S16 AND "aad-12"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/04/27 09:59
S18	4	((("10167483") or ("8916752") or ("8283522") or ("9944944")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:00
S19	3	((("9232803") or ("8685677") or ("8916751")).PN.	USPAT; USOCR	OR	OFF	2021/04/27 10:10
S20	9,986	C12N9/0071.CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11
S21	122	S20 AND "aad-12"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11
S22	63	AAD-12.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	OFF	2021/08/30 10:11

EAST Search History (Interference)

<This search history is empty>

2/14/2022 9:31:48 AM

C:\Users\dkruse\Documents\EAST\Workspaces\15468494.wsp

BARNES & THORNBURG LLP

11 South Meridian Street
 Indianapolis, Indiana 46204
 (317) 236-1313
 (317) 231-7433 Fax

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<i>Customer No.:</i>	107540	}
		}
<i>Group:</i>	1663	}
		}
<i>Confirmation No.:</i>	6867	}
		}
<i>Application No.:</i>	15/468,494	}
		}
<i>Invention:</i>	Novel Herbicide Resistance Genes	}
		}
<i>Applicant:</i>	Terry Wright et al.	}
		}
<i>Filed:</i>	March 24, 2017	}
		}
<i>Attorney Docket:</i>	14764-262737	}
		}
<i>Examiner</i>	DAVID KRUSE	}

FILED ELECTRONICALLY:**December 2, 2021****INFORMATION DISCLOSURE STATEMENT**

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450

Sir:

This Statement is filed in the captioned application identified above pursuant to 37 C.F.R. § 1.56. No representation is intended that a complete search has been made of the prior art or that no better art references than those listed are available. The filing of this Statement shall not be construed to be an admission that the information cited in the Statement is, or is considered to be, material to patentability as defined in §1.56(b). Pursuant to 37 C.F.R. § 1.98(a)(2)(ii), copies of cited U.S. patents and patent publications are not provided herewith; a copy of each cited foreign and non-patent reference is provided herewith for review by the Examiner.

None of the cited art is believed to disclose or suggest the invention recited in the claims of the captioned application. It is therefore believed that the claimed invention is patentably distinguishable over these references.

Applicant submits herewith the \$260.00 fee set forth in 37 CFR 1.17 (p) and authorize the Commissioner to charge any additional fee necessary to affect this filing to our Deposit Account No. 10-0435, with reference to our Matter No. 14764-262737.

Respectfully submitted,

/John P. Breen/

John P. Breen
Registration No. 38,833
Attorney for Applicants

JPB:pey
(317) 261-7940
Indianapolis, Indiana 46204

SHEET 1 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)
	<u>5135867</u>	August 1992	Payne et al.			
	<u>5273894</u>	December 1993	Strauch et al.			
	<u>5316931</u>	May 1994	Donson et al.			
	<u>5463175</u>	October 1995	Barry et al.			
	<u>5500360</u>	March 1996	Ahlquist et al.			
	<u>5561236</u>	October 1996	Leemans et al.			
	<u>5589367</u>	December 1996	Donson et al.			
	<u>5637489</u>	June 1997	Strauch et al.			
	<u>5646024</u>	July 1997	Leemans et al.			
	<u>5648477</u>	July 1997	Leemans et al.			
	<u>5879903</u>	March 1999	Strauch et al.			
	<u>5910626</u>	June 1999	Haselkorn			
	<u>6087563</u>	July 2000	DellaPenna			
	<u>6107549</u>	August 2000	Feng et al.			
	<u>6153401</u>	November 2000	Streber et al.			
	<u>6268547</u>	July 2001	Weeks			
	<u>6518222</u>	February 2003	Arndt et al.			
	<u>7112665</u>	September 2006	Leemans et al.			
	<u>7405074</u>	July 2008	Castle et al.			
	<u>7462481</u>	December 2008	Castle et al.			
	<u>7659448</u>	February 2010	Ahrens et al.			
	<u>7838733</u>	November 2010	Wright et al.			
	<u>7863503</u>	January 2011	Castle et al.			
	<u>7998703</u>	August 2011	Castle et al.			

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 2 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

U.S. PATENT DOCUMENTS						
Examiner Initials	Document Number	Issue or Publication Date	Name	Class	Subclass	Filing Date (If Appropriate)
	<u>8222489</u>	July 2012	Castle et al.			
	<u>8598413</u>	December 2013	Cui et al.			
	<u>9074007</u>	July 2015	Danilevskaya et al.			
	<u>9127289</u>	September 2015	Wright			
	<u>10174337</u>	January 2019	Wright			
	<u>2002/0059659</u>	May 2002	Stemmer			
	<u>2003/0041357</u>	February 2003	Jepson			
	<u>2003/0056245</u>	March 2003	Chatterjee et al.			
	<u>2003/0135879</u>	July 2003	Weeks et al.			
	<u>2009/0069182</u>	March 2009	Castle et al.			
	<u>2012/0245339</u>	September 2012	Castle et al.			
	<u>2014/0325713</u>	October 2014	Kovalic et al.			
	<u>2016/0108422</u>	April 2016	Ellis			

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 3 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Document Number	Publication Date	Country	Translation	
				Yes	No
	1471533	Jan 2004	CN		
	1025250	May 1999	EP		
	1167531	Jan 2002	EP		
	1740039	Jun 2012	EP		
	EP1695983B1	Aug 2006	EP		
	2005/287415	Oct 2005	JP		
	87/05629	Sep 1987	WO		
	96/33270	Oct 1996	WO		
	97/13402	Apr 1997	WO		
	98/02562	Jan 1998	WO		
	9808963	Mar 1998	WO		
	9820144	May 1998	WO		
	98/20144	May 1998	WO		
	9838294	Sep 1998	WO		
	9838336	Sep 1998	WO		
	9844139	Oct 1998	WO		
	9910513	Mar 1999	WO		
	1999/063092	Dec 1999	WO		
	2000/006757	Feb 2000	WO		
	0009727	Feb 2000	WO		
	0066748	Nov 2000	WO		
	2001/038513	May 2001	WO		
	03/013224	Feb 2003	WO		
	2003/056904	Jul 2003	WO		

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 4 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

INFORMATION DISCLOSURE STATEMENT**OTHER DOCUMENTS**

	Kohler, Genbank Accession No. Q8KSC8 first published on Oct. 1, 2002 (Year: 2002).
	Hogan et al, The Journal of Biological Chemistry, 275(17): 12400-12409 (Year: 2000).
	Genbank Accession No. M16730, Apr. 1993.
	Horvath, M. et al., Isolation and characterization of a 2-(2,4-dichlorophenoxy) propionic acid-degrading . . . , Appl. Microbiol Biotechnol., 1990, pp. 33, 213-216, (Abstract only).
	Kohler, Sphingomonas herbicidovorans tnpA gene for transposase and rdpA gene for (R)-2-(2,4-dichlorophenoxy) propionate, 2-oxoglutarate dioxygenase, Database EMBI, Accession No. AJ628859, Mar. 3, 2004, pp. 1-2.
	Kohler, "Sphingomonas herbicidovorans MH: A versatile phenoxyalkanoic acid herbicide degrader," J. Industrial Microbiology & Biotechnology, vol. 23, No. 4-5: 336-340 (Oct. 1999).
	Lyon, B.R., et al., "Cotton plants transformed with a bacterial degradation gene are protected from accidental spray drift damage by the herbicide 2,4-dichlorophenoxyacetic acid," Transgenic Res., 1993, pp. 2: 166-169.
	Lyon, B.R., et al., Expression of a bacterial gene in transgenic tobacco confers resistance to the herbicide 2,4-dichlorophenoxyacetic acid, Transgenic Res., 1989, pp. 33: 166-169.
	Schleinitz, K.M., Localization and Characterization of Two Novel Genes Encoding Sterospecific Diosxygenases Catalyzing 2(2,4-Dichlorophenoxy) propionate cleavage in Delftia acidovorans MCI, Applied and Environmental Microbiology, Sep. 2004, pp. 5357-5365, vol. 70, No. 9.
	Smejkal, C.W. et al., "Substrate specificity of chlorophenoxyalkanoic acid-degrading bacteria is not dependent upon phylogenetically related tfdA gene types," Biol. Fertil., 2001, pp. 33:507-513.
	Spencer et al., Segregation of transgenes in maize, Plant Molecular Biology, Jan. 1992, pp. 201-210, vol. 18, Issue 2.
	Streber et al., Analysis, cloning, and high-level expression of 2,4-dichlorophenoxyacetic monooxygenase gene tfdA of Alcaligenes eutrophus JMP134, J. Bacteriol., 1987, pp. 169: 2950-2955.
	Streber et al., Transgenic tobacco plants expressing a bacterial detoxifying enzyme are resistant to 2,4-D, Bio/Technology, 1989, pp. 7:811-816 (Abstract only).
	van der Meer, Genbank Accession No. AJ628859, NCBI-National Library of Medicine USA, Bethesda, Maryland (Mar. 3, 2004).
	Westendorf et al., The two enantiospecific dichlorprop/.alpha.-ketoglutarate-dioxygenases from Delftia acidovorans MC1--protein and sequence data of RdpA and SdpA, Microbiol. Res., 2002, pp. 157:317-322 (Abstract only).
	Muller et al, Protein Science (2006), 15:1356-1368.
	Bayley et al., Engineering 2,4-D resistance into cotton, Theoretical and Applied Genetics (1992), 83(5), 645-9.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 5 of 13

INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Bhat et al., Purification of 3,5-dichlorocatechol 1,2-dioxygenase, a nonheme iron dioxygenase and a key enzyme in the biodegradation of a herbicide, 2,4-dichlorophenoxyacetic acid (2,4-D), from <i>Pseudomonas cepacia</i> CSV90, Archives of Biochemistry and Biophysics (1993), 300(2), 738-46.
	Chaudhry and Huang, Isolation and characterization of a new plasmid from a <i>Flavobacterium</i> sp. which carries the genes for degradation of 2,4-dichlorophenoxyacetate, Journal of Bacteriology (1988), 170(9), 3897-902.
	Chen and Martin, Reasons for the acclimation for 2,4-D biodegradation in lake water, Journal of Environmental Quality (1989), 18(2), 153-6.
	Cosper et al., X-ray absorption spectroscopic analysis of Fe(II) and Cu(II) forms of a herbicide-degrading ketoglutarate dioxygenase, JBIC, Journal of Biological Inorganic Chemistry (1999), 4(1), 122-129.
	De Lipthay et al., Enhanced degradation of phenoxyacetic acid in soil by horizontal transfer of the <i>tfdA</i> gene encoding a 2,4-dichlorophenoxyacetic acid dioxygenase, FEMS Microbiology Ecology (2001), 35(1), 75-84.
	De Lipthay et al., Expression of <i>tfdA</i> genes in aquatic microbial communities during acclimation to 2,4-dichlorophenoxyacetic acid, FEMS Microbiology Ecology (2002), 40(3), 205-214.
	De Lipthay et al., In situ exposure to low herbicide concentrations affects microbial population composition and catabolic gene frequency in an aerobic shallow aquifer, Applied and Environmental Microbiology (2003), 69(1), 461-467.
	Feng and Kennedy, Biodegradation and plant protection from the herbicide 2,4-D by plant-microbial associations in cotton production systems, Biotechnology and Bioengineering (1997), 54(6), 513-519.
	Fuechslin et al., Effect of integration of a GFP reporter gene on fitness of <i>Ralstonia eutropha</i> during growth with 2,4-dichlorophenoxyacetic acid, Environmental Microbiology (2003), 5(10), 878-887.
	Harker et al., Phenoxyacetic acid degradation by the 2,4-dichlorophenoxyacetic acid (TFD) pathway of plasmid pJP4: mapping and characterization of the TFD regulatory gene, <i>tfdR</i> , Journal of Bacteriology (1989), 171(1), 314-20.
	Hawkins and Harwood, Chemotaxis of <i>Ralstonia eutropha</i> JMP134(pJP4) to the herbicide 2,4-dichlorophenoxyacetate, Applied and Environmental Microbiology (2002), 68(2), 968-972.
	Hoffmann et al., A transposon encoding the complete 2,4-dichlorophenoxyacetic acid degradation pathway in the alkali-tolerant strain <i>Delftia acidovorans</i> P4a, Microbiology (Reading, United Kingdom) (2003), 149(9), 2545-2556.
	Hogan et al., Distribution of the <i>tfdA</i> gene in soil bacteria that do not degrade 2,4-dichlorophenoxyacetic acid (2,4-D), Microbial Ecology (1997), 34(2), 90-96
	Hogan et al., Site-directed mutagenesis of 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase. Identification of residues involved in metallocenter formation and substrate binding, Journal of Biological Chemistry (2000), 275(17), 12400-12409.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 6 of 13

Form PTO-1449 (Modified)	Atty. Docket No.	Serial No.
	14764-262737	15/468,494
	Applicant(s)	
INFORMATION DISCLOSURE STATEMENT	Terry WRIGHT et al.	
	Filing Date	Art Unit
	3/24/2017	1663

OTHER DOCUMENTS	
	Jackman et al., Electrokinetic movement and biodegradation of 2,4-dichlorophenoxyacetic acid in silt soil, Biotechnology and Bioengineering (2001), 74(1), 40-48.
	Ka and Tiedje, Integration and excision of a 2,4-dichlorophenoxyacetic acid-degradative plasmid in <i>Alcaligenes paradoxus</i> and evidence of its natural intergeneric transfer, Journal of Bacteriology (1994), 176(17), 5284-9.
	Ka et al., Use of gene probes to aid in recovery and identification of functionally dominant 2,4-dichlorophenoxyacetic acid-degrading populations in soil, Applied and Environmental Microbiology (1994), 60(4), 1116-20.
	Kitagawa et al., Novel 2,4-dichlorophenoxyacetic acid degradation genes from oligotrophic <i>Bradyrhizobium</i> sp. strain HW13 isolated from a pristine environment, Journal of Bacteriology (2002), 184(2), 509-518.
	Kleinstueber et al., Expression of the 2,4-D degradative pathway of pJP4 in an alkaliphilic, moderately halophilic soda lake isolate, <i>Halomonas</i> sp. EF43, Extremophiles (2001), 5(6), 375-384.
	Laemmli et al., Mutation analysis of the different <i>tfd</i> genes for degradation of chloroaromatic compounds in <i>Ralstonia eutropha</i> JMP134, Archives of Microbiology (2004), 181(2), 112-121. (Published online: Dec. 16, 2003).
	Laurent et al., 2,4-Dichlorophenoxyacetic Acid Metabolism in Transgenic Tolerant Cotton (<i>Gossypium hirsutum</i>), Journal of Agricultural and Food Chemistry (2000), 48(11), 5307-5311
	Loos et al., Phenoxyacetate herbicide detoxication by bacterial enzymes, Journal of Agricultural and Food Chemistry (1967), 15(5), 858-60.
	Ludwig et al., Chromatographic separation of the enantiomers of marine pollutants. Part 5: enantioselective degradation of phenoxycarboxylic acid herbicides by marine microorganisms, Chemosphere (1992), 24(10), 1423-9.
	Mae et al., Characterization of a new 2,4-dichlorophenoxyacetic acid degrading plasmid pEST4011: physical map and localization of catabolic genes, Journal of General Microbiology (1993), 139(12), 3165-70.
	Maltseva et al., Degradation of 2,4-dichlorophenoxyacetic acid by haloalkaliphilic bacteria, Microbiology (Reading, United Kingdom) (1996), 142(5), 1115-1122.
	Marriott et al., Biodegradation of mixtures of chlorophenoxyalkanoic acid herbicides by <i>Alcaligenes denitrificans</i> , Journal of Industrial Microbiology & Biotechnology (2000), 25(5), 255-259.
	Matheson et al., Evidence for acquisition in nature of a chromosomal 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase gene by different <i>Burkholderia</i> spp, Applied and Environmental Microbiology (1996), 62(7), 2457-2463.
	McGowan et al., Evidence for interspecies gene transfer in the evolution of 2,4-dichlorophenoxyacetic acid degraders, Applied and Environmental Microbiology (1998), 64(10), 4089-4092.
	Muller and Babel, Pseudo-recalcitrance of chlorophenoxyalkanoate herbicides--correlation to the availability of ketoglutarate, Acta Biotechnologica (2001), 21(3), 227-242.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 7 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

INFORMATION DISCLOSURE STATEMENT**OTHER DOCUMENTS**

	Muller and Babel, Separation of two dichlorprop/ketoglutarate dioxygenases with enantiospecific properties from Comamonas acidovorans MC1, Acta Biotechnologica (1999), 19(4), 349-355.
	Muller et al., Comamonas acidovorans strain MC1. A new isolate capable of degrading the chiral herbicides dichlorprop and mecoprop and the herbicides 2,4-D and MCPA, Microbiological Research (1999), 154(3), 241-246.
	Nickel et al., Involvement of two ketoglutarate-dependent dioxygenases in enantioselective degradation of (R)- and (S)-mecoprop by Sphingomonas herbicidovorans MH, Journal of Bacteriology (1997), 179(21), 6674-6679.
	Ohkouchi et al., Cloning and expression of DL-2-haloacid dehalogenase gene from Burkholderia cepacia, Water Science and Technology (2000), 42(7-8, Hazard Assessment and Control of Environmental Contaminants (Eco hazard 99)), 261-268.
	Parker and Doxtader, Kinetics of microbial decomposition of 2,4-D in soil: effects of herbicide concentration, Journal of Environmental Quality (1982), 11(4), 679-84.
	Perkins et al., Use of Alcaligenes eutrophus as a source of genes for 2,4-D resistance in plants, Weed Science (1987), 35(Suppl. 1), 12-18.
	Plumeier et al., Importance of different tfd genes for degradation of chloroaromatics by Ralstonia eutropha JMP134, Journal of Bacteriology (2002), 184(15), 4054-4064.
	Poh et al., Complete characterization of Tn5530 from Burkholderia cepacia strain 2a (pIJB1) and studies of 2,4-dichlorophenoxyacetate uptake by the organism, Plasmid (2002), 48(1), 1-12.
	Preston et al., Multiple resistance to dissimilar herbicide chemistries in a biotype of Lolium rigidum due to enhanced activity of several herbicide degrading enzymes, Pesticide Biochemistry and Physiology (1996), 54(2), 123-134.
	Saari et al., Stereospecific degradation of the phenoxypropionate herbicide dichlorprop, Journal of Molecular Catalysis B: Enzymatic (1999), 6(4), 421-428.
	Schneiderheinze et al., Plant and soil enantioselective biodegradation of racemic phenoxyalkanoic herbicides, Chirality (1999), 11(4), 330-337.
	Shaw and Burns, Enhanced mineralization of [U-14C]2,4-dichlorophenoxyacetic acid in soil from the rhizosphere of Trifolium pratense, Applied and Environmental Microbiology (2004), 70(8), 4766-4774.
	Tett et al., Enantioselective degradation of the herbicide mecoprop [2-(2-methyl-4-chlorophenoxy)propionic acid] by mixed and pure bacterial cultures, FEMS Microbiology Ecology (1994), 14(3), 191-200.
	Top et al., Capture of a catabolic plasmid that encodes only 2,4-dichlorophenoxyacetic acid:ketoglutaric acid dioxygenase (TfdA) by genetic complementation, Applied and Environmental Microbiology (1996), 62(7), 2470-2476.
	Top et al., Methane oxidation as a method to evaluate the removal of 2,4-dichlorophenoxyacetic acid (2,4-D) from soil by plasmid-mediated bioaugmentation, FEMS Microbiology Ecology (1999), 28(3), 203-213.
	Travkin et al., Characterization of an intradiol dioxygenase involved in the biodegradation of the chlorophenoxy herbicides 2,4-D and 2,4,5-T, FEBS Letters (1997), 407(1), 69-72.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 8 of 13

Form PTO-1449 (Modified)	Atty. Docket No.	Serial No.
	14764-262737	15/468,494
	Applicant(s) Terry WRIGHT et al.	
INFORMATION DISCLOSURE STATEMENT	Filing Date	Art Unit
	3/24/2017	1663

OTHER DOCUMENTS	
	Vallaes et al., PCR-RFLP analysis of 16S rRNA, tfdA and tfdB genes reveals a diversity of 2,4-D degraders in soil aggregates, FEMS Microbiology Ecology (1997), 24(3), 269-278.
	Vallaes et al., The metabolic pathway of 2,4-dichlorophenoxyacetic acid degradation involves different families of tfdA and tfdB genes according to PCR-RFLP analysis, FEMS Microbiology Ecology (1996), 20(3), 163-172.
	Vedler et al., Analysis of the 2,4-dichlorophenoxyacetic acid-degradative plasmid pEST4011 of Achromobacter xylosoxidans subsp. denitrificans strain EST4002, Gene (2000), 255(2), 281-288.
	Vedler et al., TfdR, the LysR-type transcriptional activator, is responsible for the activation of the tfdCB operon of Pseudomonas putida 2,4-dichlorophenoxyacetic acid degradative plasmid pEST4011, Gene (2000), 245(1), 161-168.
	Zhang et al., In vitro assay for 2,4-D resistance in transgenic cotton, in Vitro Cellular & Developmental Biology: Plant (2001), 37(2), 300-304.
	Zipper et al., Complete microbial degradation of both enantiomers of the chiral herbicide mecoprop [(RS)-2-(4-chloro-2-methylphenoxy)propionic acid] in an enantioselective manner by Sphingomonas herbicidovorans sp. Nov, Applied and Environmental Microbiology (1996), 62(12), 4318-4322.
	Zipper et al., Enantioselective uptake and degradation of the chiral herbicide dichlorprop [(RS)-2-(2,4-dichlorophenoxy)propanoic acid] by Sphingomonas herbicidovorans MH, Journal of Bacteriology (1998), 180(13), 3368-3374.
	Cho et al, Agricultural Chemistry and Biotechnology (English Edition) (1999), 42(2), 57-61 , Isolation and characterization of 2-methyl-4-chlorophenoxyacetic acid-degrading bacteria from agricultural soils.
	Lim et al, Journal of Microbiology (Seoul, Republic of Korea) (2004), 42(2), 87-93 Genetic and phenotypic diversity of (R/S)-mecoprop [2-(2-methyl-4-chlorophenoxy)propionic acid]-degrading bacteria isolated from soils.
	Tamura et al, Nippon Noyaku Gakkaishi (2001), 26(3), 309-314 , Microbial pesticide degradations and evolutionary analysis of degrading enzymes.
	Vallaes et al, Biotechnology Letters (1998), 20(11), 1073-1076 , Isolation and characterization of a stable 2,4-dichlorophenoxyacetic acid degrading bacterium, Variovorax paradoxus, using chemostat culture.
	Fukamori and Hausinger, JBC (268)24311(1993), Purification and characterization of 2,4-Dichlorophenoxyacetate/a-ketogutarate dioxygenase.
	Fukamori and Hausinger, J Bacteriology (175)2083(1993), Alcaligenes eutrophus JMP134 "2,4-Dichlorophenoxyacetate monooxygenase" is an a-Ketoglutarate-dependent dioxygenase.
	Ehrig et al., Acta Biotechnologica (17)351-356(1997), Isolation of phenoxyherbicidedegrading Rhodoferax species from contaminated building material.
	Hausinger, Critical Reviews in Biochemistry (39)21-68(2004), Fe(II)/.alpha.-Ketoglutarate-Dependent Hydroxylases and Related Enzymes.
	Hausinger and Fukamori, Env Health Perspectives (103)37-39(1995), Characterization of the first enzyme in 2,4-Dichlorophenoxyacetic acid metabolism.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 9 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

INFORMATION DISCLOSURE STATEMENT**OTHER DOCUMENTS**

	Don et al., J Bacteriol (161)85(1985), Transposon Mutagenesis and Cloning Analysis of the Pathways for Degradation of 2,4-Dichlorophenoxyacetic Acid and 3-Chlorobenzoate in <i>Alcaligenes eutrophus</i> JMP134(pJP4).
	Don et al., J Bacteriol (161)466(1985), Genetic and Physical Map of the 2,4-Dichlorophenoxyacetic Acid-Degradative Plasmid pJP4.
	Hotopp et al., J. Molec. Catalysis B: Enzymatic (15)155-162(2001), Alternative substrates of 2,4-dichlorophenoxyacetate/-ketoglutarate dioxygenase.
	Park et al, Journal of Microbiology and Biotechnology (2003), 13(2), 243-250 , Isolation and characterization of 4-(2,4-dichlorophenoxy)butyric acid-degrading bacteria from agricultural soils.
	Mueller RH, Babel W. Degradability and recalcitrance of phenoxyalkanoic acid herbicides--traits of the microbial metabolism. In Second International Conference on Remediation of Chlorinated and Recalcitrant Compounds 2000 (pp. 229-236).
	Tett, Biodegradation (1997), 8(1), 43-52 , Biodegradation of the chlorophenoxy herbicide (R)-(+)-mecoprop by <i>Alcaligenes denitrificans</i> .
	Llewellyn et al, Herbicide-Resistant Crops (1996), 159-74, Genetic engineering of crops for tolerance to 2,4-D.
	Baelum et al., Appl. Environ. Microbiol. (72)1476-1486 (2006), Degradation of 4-Chloro-2-Methylphenoxyacetic Acid in Top- and Subsoil is Quantitatively Linked to the Class III tfdA Gene
	Baelum et al., Appl. Environ. Microbiol. (75)2969-2972 (2009), TaqMan Probe-Based Real-Time PCR Assay for Detection and Discrimination of Class I, II, and III tfdA Genes in Soils Treated with Phenoxy Acid Herbicides.
	Griffin et al., J Agric Food Chem (61)6589-6596(2013), Characterization of Aryloxyalkanoate Dioxygenase-12, a Nonheme Fe(II)/.alpha.-Ketoglutarate-Dependent Dioxygenase, Expressed in Transgenic Soybean and <i>Pseudomonas fluorescens</i> .
	Hausinger, RSC Metallobiology (2015) Chapter 1 of 2-Oxoglutarate-dependent oxygenases, Biochemical diversity of 2-oxoglutarate-dependent oxygenases.
	Leibeling et al, Eng Life Sci (13)278(2013), Posttranslational oxidative modification of (R)-2-(2,4-dichlorophenoxy) propionate/.alpha.-ketoglutarate-dependent dioxygenases (RdpA) leads to improved degradation of 2,4-dichlorophenoxyacetate (2,4-D).
	Muller et al., Applied and Environmental Microbiology (72)4853(2006), Purification and Characterization of Two Enantioselective a-Ketoglutarate-Dependent Dioxygenases, RdpA and SdpA, from <i>Sphingomonas herbicidovorans</i> MH.
	Zapras et al, Appl. Environ. Microbiol. (76)119(2010), Abundance of Novel and Diverse tfdA-Like Genes, Encoding Putative Phenoxyalkanoic Acid Herbicide-Degrading Dioxygenases, in Soil.
	Zhang et al. Journal of Agricultural and Food Chemistry (2020), 68(26), 6967-6976 CODEN: JAFCAU; ISSN: 0021-8561 Enantioselective Catabolism of the Two Enantiomers of the Phenoxyalkanoic Acid Herbicide Dichlorprop by <i>Sphingopyxis</i> sp. DBS4.
	Krausse et al., 4th biotechnology symposium of the University of Leipzig (abstract) p. 60 (2005), Crystal structure of the 2-oxoglutarate dependent dioxygenase RdpA.

EXAMINER: /DAVID H KRUSE/

DATE CONSIDERED: 02/14/2022

SHEET 10 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Mueller et al., Un Mich ICBIC 2005 abstract, Insights into the enantiospecificities of (R)- and (S)-dichlorprop/a-ketoglutarate dioxygenases.
	Krausse et al., Freiberg Un Deutschen Gesellschaft fur Kristallographie (2006), (Poster title 72L) Structure of the 2-Oxoglutarate Dependent Dioxygenase RdpA by X-ray Crystallography and Small Angle X-ray Scattering.
	Gazitua et al., Environ Microbiol (12)2411(2010), Novel .alpha.-ketoglutarate dioxygenase tfdA-related genes are found in soil DNA after exposure to phenoxyalkanoic herbicides.
	Chekan et al., Proceedings of the National Academy of Sciences (116)13299-13304(2019), Molecular basis for enantioselective herbicide degradation imparted by aryloxyalkanoate dioxygenases in transgenic plants.
	Larue et al, Pest Manag Sci (75)2086(2019), Development of enzymes for robust aryloxyphenoxypionate and synthetic auxin herbicide tolerance traits in maize and soybean crops.
	Liu et al., FEMS Microbiol Ecol (86)114-129(2013) , Consumers of 4-chloro-2-methylphenoxyacetic acid from agricultural soil and drilosphere harbor cadA, r/sdpA, and tfdA-like gene encoding oxygenases.
	Muller et al., Protein Science (15)prot1356(2006), Structural basis for the enantiospecificities of R- and S-specific phenoxypropionate/a-ketoglutarate dioxygenases.
	Muller, Eng Life Sci (7)311-321 (2007), Activity and Reaction Mechanism of the Initial Enzymatic Step Specifying the Microbial Degradation of 2,4-Dichlorophenoxyacetate.
	Westendorf, Eng Life Sci (6)552-559(2006), Kinetic Traits and Enzyme Form Patterns of (R)-2-(2,4-Dichlorophenoxy) propionate/a-Ketoglutarate Dioxygenase (RdpA) after Expression in Different Bacterial Strains.
	Wright et al., Proc Natl Acad Sci (107)20240(2010), Robust crop resistance to broadleaf and grass herbicides provided by aryloxyalkanoate dioxygenase transgenes.
	GenBank accession No. AAA21983.1 tfdA Cupriavidus necator (replaced Ralstonia eutropha), Apr. 23, 1993.
	GenBank accession No. AAK81681.1 tfdA Burkholderia cepacia, Aug. 24, 2020, Jul. 23, 2016.
	UniProtKB accession No. Q45423.1 tfdA Burkholderia sp. RASC, Nov. 1, 1996.
	GenBank accession No. AAS49436 tfdA Achromobacter denitrificans, Apr. 3, 2020.
	GenBank accession No. AAB47567.1 tfdABurkholderia cepacia pIJB, Jul. 26, 2016.
	GenBank accession No. AAM76772.1 tfdADelftia acidovorans_-287 aaProtein_-NCBI Jul. 26, 2016.
	GenBank accession No. BAB92965.1 tfdA alpha proteobacterium HWK12, Jul. 2, 2002.
	GenBank accession No. BAB92966.1 tfdA alpha proteobacterium HW13, Jul. 2, 2002.
	NCBI accession No. WP_011084309.1 tfdA Bradyrhizobium diazoefficiens (replaced B. japonicum), Jul. 27, 2019.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 11 of 13

Form PTO-1449 (Modified) INFORMATION DISCLOSURE STATEMENT	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	UniProtKB accession No. P83309.2 sdpA MC1 Delftia aciovorans, Sep. 18, 2019.
	UniProtKB accession No. Q700X4.1 sdpA MH Shingobium herbicidovorans, Nov. 1, 1996.
	GenBank accession No. ABD67501.1 sdpA P230 Rhodoferax sp. P230, Mar. 14, 2006.
	Muller, Swiss Federal Institute of Technology thesis (Nov. 2004), Metabolism of phenoxyalkanoic acid herbicides in Sphingomonas herbicidovorans MH cloning and characterization of two enantiospecific .alpha.-ketoglutarate-dependent dioxygenases and degradation pathway analysis.
	Westendorf Universitat Leipzig thesis-German (2005), Enantioselektive Verwertung von Phenoxyalkanoat-Herbiziden durch Bakterien--Eine Charakterisierung der Dioxygenasen des initialen Abbau-Schrittes.
	Baelum et al., System Appl Microbiol. (33)67(2010), Supplemental Material to Comparison of 16S rRNA gene phylogeny and functional tfdA gene distribution in thirty-one different 2, 4-dichlorophenoxyacetic acid and 4-chloro-2-methylphenoxyacetic acid degraders.
	Han et al, World Journal of Microbiology & Biotechnology (2014), 30(10)2567-2576 , 16S rRNA gene phylogeny and tfdA gene analysis of 2,4-D-degrading bacteria isolated in China.
	Zhang et al., J. Agric. Food Chem. (58)12878(2010), Enantioselective Environmental Behavior of the Chiral Herbicide Fenoxaprop-ethyl and Its Chiral Metabolite Fenoxaprop in Soil.
	Wu et al., J. Agric. Food Chem. (65)3711(2017), Rapid Biodegradation of the Herbicide 2,4-Dichlorophenoxyacetic Acid by Cupriavidus gilardii T-1.
	Zabaloy et al., Ann Microbiol (64)969(2014), Isolation and characterization of indigenous 2,4-D herbicide degrading bacteria from an agricultural soil in proximity of Sauce Grande River, Argentina.
	Nielsen et al., PLOS One 8(12)e83346(2013), Novel Insight into the Genetic Context of the cadAB Genes from a 4-chloro-2-methylphenoxyacetic Acid-Degrading Sphingomonas.
	Mierzejewska et al, Bulletin Env Contam Tox (104)200(2020), Biodegradation Potential and Ecotoxicity Assessment in Soil Extracts Amended with Phenoxy Acid Herbicide (2,4-D) and a Structurally-Similar Plant Secondary Metabolite (Ferulic Acid).
	Shimojo et al., J Biosc Bioengin. (108)56(2009), Analysis of genes encoding the 2,4-dichlorophenoxyacetic acid degrading enzyme from Sphingomonas agrestis 58-1.
	Han et al, World Journal of Microbiology & Biotechnology (2015), 31(7), 1021-1030 , Cloning, expression, characterization and mutational analysis of the tfdA gene from Cupriavidus campinensis BJ71.
	Paulin et al., Environ Microbiol (13)1513-1523(2011), (R,S)-dichloroprop herbicide in agricultural soil induces proliferation and expression of multiple dioxygenase-encoding genes in the indigenous.
	Muller et al., Protein Science (15)prot1356(2006), Supplemental Table and Figures to Structural basis for the enantiospecificities of R- and S-specific phenoxypropionate/a-ketoglutarate dioxygenases.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 12 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	GenBank accession No. BAB92964.1 tfdAa alpha proteobacterium RD5-C2--NCBI. Jul. 2, 2002.
	Poh et al., 2,4-Dichlorophenoxyacetate / .alpha.-ketoglutarate dioxygenases from Burkholderia cepacia 2a and Ralstonia eutropha JMP134, Microbios 105 43-63 2001.
	Suwa et al., Characterization of a chromosomally encoded 2,4-dichlorophenoxyacetic acid/ketoglutarate dioxygenase from Burkholderia sp. strain RASC, Applied and Environmental Microbiology (1996), 62(7), 2464-2469.
	Itoh et al., tfdA-like genes in 2,4-dichlorophenoxyacetic acid-degrading bacteria belonging to the Bradyrhizobium-Agromonas-Nitrobacter-Acipia cluster in Proteobacteria, Applied and Environmental Microbiology (2002), 68(7), 3449-3454.
	Vedler et al. The Completely Sequenced Plasmid pEST4011 Contains a Novel IncP1 Backbone and a Catabolic Transposon Harboring tfd Genes for 2,4-Dichlorophenoxyacetic Acid Degradation, Journal of Bacteriology, vol. 186, No. 21, Nov. 2004, p. 7161-7174.
	Hoffmann et al., Development and application of PCR primers for the detection of the lid genes in Delftia acidovorans P4a involved in the degradation of 2,4-D, Acta Biotechnologica (2001), 21(4), 321-331.
	Itoh et al., Root nodule Bradyrhizobium spp. harbor tfdA and cadA, homologous with genes encoding 2,4-dichlorophenoxyacetic acid-degrading proteins, Applied and Environmental Microbiology (2004), 70(4), 2110-2118.
	Kaneko et al., Complete Genomic Sequence of Nitrogen-fixing Symbiotic Bacterium Bradyrhizobium japonicum USDA110 (Supplement). DNA Research 9,--Supplement, 225-256 (2002).
	Muller et al., Genetic Analysis of Phenoxyalkanoic Acid Degradation in Sphingomonas herbicidovorans MH; Applied and Environmental Microbiology, Oct. 2004, vol. 70, No. 10, p. 6066-6075.
	Muller et al., Physiological and genetic characteristics of two bacterial strains utilizing phenoxypropionate and phenoxyacetate herbicides, Microbiological Research (2001), 156(2), 121-131.
	Eichhorn Eric et al: "Characterization of alpha-ketoglutarate-dependent taurine dioxygenase from Escherichia coli", Journal of Biological Chemistry, vol. 272, No. 37, 1997, pp. 23031-23036, ISSN: 0021-9258.
	Bisht Na Veen Chandra et al: "Development of 2,4-O-resistant transgenics in Indian oilseed mustard (Brassica juncea)", Current Science (Bangalore), vol. 87, No. 3, Aug. 10, 2004 (Aug. 10, 2004), pp. 367-370, ISSN: 0011-3891.
	Opposition filed against EP 10012200.1, filed on Dec. 20, 2013.
	Opposition filed against EP 10012201.9, filed on Dec. 6, 2013.
	Opposition filed against EP 10012202.7, filed on Dec. 20, 2013.
	Opposition filed against EP 10012199.5, filed on Jun. 18, 2014.

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
---------------------------	-----------------------------

SHEET 13 of 13

Form PTO-1449 (Modified)	Atty. Docket No. 14764-262737	Serial No. 15/468,494
	Applicant(s) Terry WRIGHT et al.	
	Filing Date 3/24/2017	Art Unit 1663

OTHER DOCUMENTS	
	Molecular Cloning, a Laboratory Manual, Cold Spring Harbor Laboratory Press, Second Edition., 1989, vol. 2, p. 11.45.
	Applicant Response to Opposition filed against EP 10012200.1, filed on Aug. 8, 2014.
	Applicant Response to Opposition filed against EP 10012201.9, filed on Jul. 28, 2014.
	Applicant Response to Opposition filed against EP 10012202.7, filed on Jul. 28, 2014.
	Applicant Response to Opposition filed against EP 10012199.5, filed on Nov. 22, 2014.
	Final Decision in Opposition filed against EP 10012200.1, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012201.9, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012202.7, filed on Aug. 1, 2016.
	Final Decision in Opposition filed against EP 10012199.5, dated Feb. 9, 2016.
	Kohler, Genbank Accession No. AJ628859, March 2004

EXAMINER: /DAVID H KRUSE/	DATE CONSIDERED: 02/14/2022
--------------------------------------	--------------------------------

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	NOVEL HERBICIDE RESISTANCE GENES
--------------------	----------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/491,197

filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Terry R. Wright

Date (Optional): 4/24/18

Signature: Terry R. Wright

Note: An application data sheet (PTO/AIA/01 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-8199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-576) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	NOVEL HERBICIDE RESISTANCE GENES
-------------------------------	-----------------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or
☒ United States application or PCT international application number 14/491,197
filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

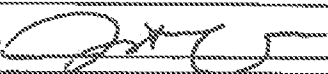
I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Justin M. Lira Date (Optional): 04/24/18
Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-5199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-575) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary, and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

NOVEL HERBICIDE RESISTANCE GENES

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/491,197

filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

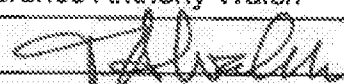
LEGAL NAME OF INVENTOR

Inventor: Terence Anthony Walsh

Date (Optional):

4/26/16

Signature:



Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing this form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

NOVEL HERBICIDE RESISTANCE GENES

As the below named inventor, I hereby declare that:

This declaration
is directed to:



The attached application, or



United States application or PCT international application number 14/491,197

filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Donald Merio

Date (Optional) April 28, 2018

Signature: Donald Merio

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	NOVEL HERBICIDE RESISTANCE GENES
-------------------------------	-----------------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or
☒ United States application or PCT international application number 14/491,197
 filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

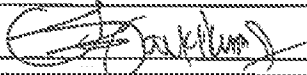
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identify theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Jayakumar Pon Samuel Date (Optional): _____

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of
Invention

NOVEL HERBICIDE RESISTANCE GENES

As the below named inventor, I hereby declare that:

This declaration
is directed to:

☐

The attached application, or

☒

United States application or PCT international application number 14/491,197

filed on 09/19/2014

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Gaofeng Lin

Date (Optional)

28 Apr 2018

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	45113088
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	01-MAR-2022
Filing Date:	24-MAR-2017
Time Stamp:	11:00:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	14491197Declaration.pdf	1571746	no	12
			4d1c29fed107c43965de9e741277fc0154d8928c		

Warnings:

Information:	
Total Files Size (in bytes):	1571746
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒

Practitioners associated with Customer Number: 186233

OR

☐

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒

The address associated with Customer Number: 186233

OR

☐

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: CORTEVA AGRISCIENCE LLC
9330 Zionsville Road
Indianapolis, Indiana 46268

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	<i>Kenneth B. Ludwig</i>	Date	3-19-2022
Name	Kenneth B. Ludwig	Telephone	317 337-8944
Title	Authorized Representative		

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	45294527
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	23-MAR-2022
Filing Date:	24-MAR-2017
Time Stamp:	08:50:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	373.pdf	120671	no	3
			87562669c2f449217d769b731e52244951b860bb		

Warnings:

Information:					
2	Power of Attorney	Corteva_POA_EX2.pdf	453868	no	2
			38638fb8aaa698e42f41c16f88f8afee2b39ebca9		
Warnings:					
Information:					
Total Files Size (in bytes):				574539	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: CORTEVA AGRISCIENCE LLCApplication No./Patent No.: 15/468,494 Filed/Issue Date: March 24, 2017Titled: NOVEL HERBICIDE RESISTANCE GENESCORTEVA AGRISCIENCE LLC, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Inventors To: DOW AGROSCIENCES LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 021361, Frame 0768, or for which a copy thereof is attached.2. From: DOW AGROSCIENCES LLC To: CORTEVA AGRISCIENCE LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 058044, Frame 0184, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/John P Breen/

 Signature

John P Breen

 Printed or Typed Name

March 23, 2022

 Date

38833

 Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737

107540
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

CONFIRMATION NO. 6867
IMPROPER CPOA LETTER



Date Mailed: 03/25/2022

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 03/23/2022. The power of attorney in this application is not accepted for the reason(s) listed below:

- The power of attorney has not been accepted because the party who is giving power has not been identified. Power of attorney may only be signed by the applicant for patent (37 CFR 1.42) or the patent owner. A party who is not the applicant must become the applicant in accordance with 37 CFR 1.46(c) and appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. For a reissue application, reexamination proceeding, or supplemental examination proceeding, a patent owner who was not the applicant under 37 CFR 1.46 must appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. See 37 CFR 1.32(b)(4).

/zabrah/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

186233
Barnes & Thornburg LLP (CORTEVA)
11 South Meridian Street
Indianapolis, IN 46204
UNITED STATES



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737

107540
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

CONFIRMATION NO. 6867
IMPROPER CFR REQUEST



Date Mailed: 03/25/2022

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Power of Attorney, Claims, Fees, System Limitations, and Miscellaneous

In response to your request for a corrected Filing Receipt, the Office is unable to comply with your request because:

- Any request to correct or update the name of the applicant must include an application data sheet (ADS) in compliance with 37 CFR 1.76 specifying the correct or updated name of the applicant in the applicant information section. Any request to change the applicant after an original applicant has been specified under 37 CFR 1.46(b) must include a new ADS in compliance with 37 CFR 1.76 specifying the applicant in the applicant information section and comply with 37 CFR 3.71 and 3.73. See 37 CFR 1.46(c).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/zabraha/

CORRECTED ADS FORM

Application Number	15468494
Title of Invention	NOVEL HERBICIDE RESISTANCE GENES

Inventor Information

****If no data is shown, no data has been corrected****

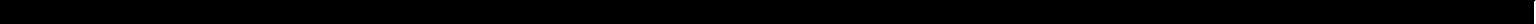
	Data of Record	Updated Data
Order Number		
Name		

Residence Information

Residency		
City		
State		
Country of Residence		

Mailing Address of Inventor

Address 1		
Address 2		
City,State/Province, Postal Code		
Country		



Application Information

	Data of Record	Updated Data
Title of Invention	NOVEL HERBICIDE RESISTANCE GENES	
Attorney Docket Number	14764-262737	
Entity Type	Regular Undiscounted	

Domestic Benefit/National Stage Information

****If no data is shown, no data has been corrected****

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121,365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S. C. 119(e) or 120, and 37 CFR 1.78(a).

	Data of Record	Updated Data
Prior Application Status		
Application Number		
Continuity Type		
Prior Application Number		
Filing Date (YYYY-MM-DD)		
Patent Number		
Issue Date (YYYY-MM-DD)		

Foreign Priority Information

****If no data is shown, no data has been corrected****

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

		Data of Record	Updated Data
	Application Number		
	Country		
	Filing Date		
	Access Code		

Applicant Information

****If no data is shown, no data has been corrected****

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

	Data of Record	Updated Data
Applicant Type	ASG	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is		
Name of the Deceased or Legally Incapacitated Inventor		
Applicant is an Organization	Yes	
Name		
Organization Name	DOW AGROSCIENCES LLC	<u>CORTEVA AGRISCIENCE LLC</u>
Address 1		
Address 2		

City,State/Province,Postal Code	Indianapolis IN	
Country		
Phone Number		
Fax Number		
Email Address		

Assignee Information including Non-Applicant Assignee Information

****If no data is shown, no data has been corrected****

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office

	Data of Record	Updated Data
Order		
Applicant is an Organization		
Name		
Organization Name		

Mailing Address

Address 1		
Address 2		
City,State/Province,Postal Code		
Country		
Phone Number		
Fax Number		
Email Address		

Signature

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/John Breen/	Registration Number	38833
First Name	John	Last Name	Breen

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: CORTEVA AGRISCIENCE LLCApplication No./Patent No.: 15/468,494 Filed/Issue Date: March 24, 2017Titled: NOVEL HERBICIDE RESISTANCE GENESCORTEVA AGRISCIENCE LLC, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Inventors To: DOW AGROSCIENCES LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 021361, Frame 0768, or for which a copy thereof is attached.2. From: DOW AGROSCIENCES LLC To: CORTEVA AGRISCIENCE LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 058044, Frame 0184, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/John P Breen/

 Signature

April 14, 2022

Date

John P Breen

 Printed or Typed Name

38833

Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	45478487
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	14-APR-2022
Filing Date:	24-MAR-2017
Time Stamp:	16:43:44
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet to update/ correct info	CorrectedADS.pdf	99687	no	5
			429dc9a40adde05a951ea5043914c81008219db2		

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	373_final.pdf	89221	no	3
			e2dae309ab2f88026800a0d9426932d5e3eea3c1		
Warnings:					
Information:					
Total Files Size (in bytes):				188908	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/468,494	03/24/2017	1663	3200	14764-262737	32	2

107540
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

CONFIRMATION NO. 6867
CORRECTED FILING RECEIPT



Date Mailed: 04/18/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Terry R. WRIGHT, Carmel, IN;
Justin M. LIRA, Zionsville, IN;
Terence Anthony WALSH, Zionsville, IN;
Donald MERLO, Carmel, IN;
Jayakumar Pon SAMUEL, Carmel, IN;
Gaofeng LIN, Zionsville, IN;

Applicant(s)

CORTEVA AGRISCIENCE LLC, Indianapolis, IN;

Power of Attorney: The patent practitioners associated with Customer Number 107540

Domestic Priority data as claimed by applicant

This application is a CON of 14/491,197 09/19/2014 PAT 10167483
which is a CON of 13/647,081 10/08/2012 PAT 8916752
which is a CON of 12/091,896 11/03/2008 PAT 8283522
which is a 371 of PCT/US06/42133 10/27/2006
which claims benefit of 60/731,044 10/28/2005

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/17/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/468,494**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

NOVEL HERBICIDE RESISTANCE GENES

Preliminary Class

800

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor

community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒ Practitioners associated with Customer Number: 186233

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒ The address associated with Customer Number: 186233

OR


Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address: CORTEVA AGRISCIENCE LLC
9330 Zionsville Road
Indianapolis, Indiana 46268

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature 	Date April 14 2022
Name KURT VAN THONNE	Telephone
Title ASSISTANT SECRETARY	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	45491536
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	107540
Filer:	John P. Breen
Filer Authorized By:	
Attorney Docket Number:	14764-262737
Receipt Date:	18-APR-2022
Filing Date:	24-MAR-2017
Time Stamp:	08:52:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	373_final.pdf	89221	no	3
			e2dae309ab2f88026800a0d9426932d5e3e ea3c1		

Warnings:

Information:					
2	Power of Attorney	Corteva_POA.pdf	121538	no	1
			a14a4e2f902cf8db94a7b46d01ea6a815474371a		
Warnings:					
Information:					
Total Files Size (in bytes):			210759		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: CORTEVA AGRISCIENCE LLCApplication No./Patent No.: 15/468,494 Filed/Issue Date: March 24, 2017Titled: NOVEL HERBICIDE RESISTANCE GENESCORTEVA AGRISCIENCE LLC, a Corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Inventors To: DOW AGROSCIENCES LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 021361, Frame 0768, or for which a copy thereof is attached.2. From: DOW AGROSCIENCES LLC To: CORTEVA AGRISCIENCE LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 058044, Frame 0184, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/John P Breen/

 Signature

April 14, 2022

Date

John P Breen

 Printed or Typed Name

38833

Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737

186233
Barnes & Thornburg LLP (CORTEVA)
11 South Meridian Street
Indianapolis, IN 46204

CONFIRMATION NO. 6867
POA ACCEPTANCE LETTER



Date Mailed: 04/19/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/18/2022.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dgela/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737

CONFIRMATION NO. 6867

POWER OF ATTORNEY NOTICE



107540
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

Date Mailed: 04/19/2022

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/18/2022.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dgela/

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

107540 7590 03/01/2022
Barnes & Thornburg LLP (Dow)
11 South Meridian Street
Indianapolis, IN 46204

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	03/24/2017	Terry R. WRIGHT	14764-262737	6867

TITLE OF INVENTION: NOVEL HERBICIDE RESISTANCE GENES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	06/01/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
KRUSE, DAVID H	1663	800-300000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Barnes & Thornburg LLP

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Corteva Agriscience LLC

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Indianapolis, IN

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 100435

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29☐ Applicant asserting small entity status. See 37 CFR 1.27☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /John P. Breen/

Date May 26, 2022

Typed or printed name John P. Breen

Registration No. 38833

Electronic Patent Application Fee Transmittal				
Application Number:		15468494		
Filing Date:		24-Mar-2017		
Title of Invention:		NOVEL HERBICIDE RESISTANCE GENES		
First Named Inventor/Applicant Name:		Terry R. WRIGHT		
Filer:		John P. Breen/Priscilla York		
Attorney Docket Number:		14764-262737		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1200

Electronic Acknowledgement Receipt

EFS ID:	45813585
Application Number:	15468494
International Application Number:	
Confirmation Number:	6867
Title of Invention:	NOVEL HERBICIDE RESISTANCE GENES
First Named Inventor/Applicant Name:	Terry R. WRIGHT
Customer Number:	186233
Filer:	John P. Breen/Priscilla York
Filer Authorized By:	John P. Breen
Attorney Docket Number:	14764-262737
Receipt Date:	26-MAY-2022
Filing Date:	24-MAR-2017
Time Stamp:	15:51:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1200
RAM confirmation Number	E20225PF52191969
Deposit Account	100435
Authorized User	Priscilla York

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)
37 CFR 1.20 (Post Issuance fees)
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	262737_Issue_Fee_Transmittal.pdf	120401	no	1
			d5696e8dde352249e901ad81cf19b1d7c30f1a5		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	38069	no	2
			2de815076ec35a6c467b7894f8e4b10d58dabb9		

Warnings:

Information:

Total Files Size (in bytes):	158470
-------------------------------------	--------

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111


If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Please type a plus sign (+) inside this box 

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.H.K/

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known

Application Number:	15/468494
Filing Date:	March 24, 2017
First Named Inventor:	WRIGHT, Terry R.
Group Art Unit:	1663
Confirmation Number:	6867
Examiner Name:	Kruse, David
Attorney Docket Number:	14764-262737

U.S. PATENT DOCUMENTS

Examiner Initials	Doc. No.	U.S. Patent Document Application or Patent Number	Kind Code	Name of Patentee or Applicant	Date of Publication	Filing Date If Appropriate
	AA	4683195		Mullis et al. 07/1987	07-28-1997	
	AB	4761373		Anderson et al.	08-02-1988	
	AC	5608147		Kaphammer	03-1997	
	AD	5656422		Crawford	08-1997	
	AE	6645497		Malvar et al.	11-2003	
	AF	6664384		Xu	12-2003	
	AG	7205561		Pallet, et al. Chelvayohan, et al.	6-1998 04/2007	
	AH	8278505		Lira	10-2012	
	AI	8283522		Wright, Terry R.	10-2012	
	AJ	8916752		Wright, Terry R.	12-2014	
	AK	9062284		Lira	06-2015	

FOREIGN PATENT DOCUMENTS

Examiner Initials	Doc. No.	Foreign Patent Document			Name of Patentee or Applicant	Date of Publication	Translation	
		Office	Application or Patent Number	Kind Code			Yes	No**
	AL	WO	2003/034813		U.S. Secretary of Agriculture	05-01-2003		
	AM	WO	2005/107437		Dow Agrosciences LLC	11-17-2005		
	AN	WO	2007/053482		Dow Agrosciences LLC	05-10-2007		

OTHER - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Doc. No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number (s), publisher, city and/or country where published.	Translation	
			Yes	No**
	AO	Fourgoux-Nicol et al., Isolation of rapeseed genes expressed early and specifically during development of the male gametophyte, Plant Biology, 1999, Vol. 40, p. 857-872		
	AP	Gressel, Jonathan, Molecular biology of weed control, Transgenic Research 2000, Vol. 9, p. 355-382		
	AQ	Halford et al., Weed Technology, 2001, Vol. 15, p. 737-744		
	AR	Hegg, Eric L. et al., Herbicide-Degrading α -Keto Acid-Dependent Enzyme TfdA: Metal Coordination Environment and Mechanistic Insights, Biochemistry, 1999, Vol. 38, p. 16714-16726		
	AS	Iowa State University Extension 2005 Herbicide manual for Agricultural Professionals, p. 50-72		
	AT	Kasuga, Mie, Improving Plant Drought, Salt, and Freezing Tolerance by Gene Transfer of a Single Stress-Inducible Transcription Factor, Nature Biotechnology, March 1999, Vol. 17, p. 287-291		
	AU	Maliga, Current Opinion in Plant Biology, 5:164-172 (2002).		
	AV	Perlack, Frederick J., Modification of the Coding Sequence Enhances Plant Expression of Insect Control Protein Genes, Proc. Natl. Acad. Sci., USA, Biochemistry, April 1991, Vol. 88, p. 3324-3328		

EXAMINER	/DAVID H KRUSE/	DATE CONSIDERED	04/16/2019
----------	-----------------	-----------------	------------

* A concise statement of relevance is being submitted in lieu of a translation. 37 CFR 1.98(a)(3).

+ An English-language equivalent/patent, or an English-language abstract, or an English-language version of the search report or action by a foreign patent office in a counterpart foreign application indicating the degree of relevance found by the foreign office is being submitted in lieu of a concise explanation of relevance under 37 CFR 1.98(a)(3).



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/468,494	06/28/2022	11371055	14764-262737	6867

186233 7590 06/08/2022
Barnes & Thornburg LLP (CORTEVA)
11 South Meridian Street
Indianapolis, IN 46204

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 217 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Terry R. WRIGHT, Carmel, IN;
Justin M. LIRA, Zionsville, IN;
Terence Anthony WALSH, Zionsville, IN;
Donald MERLO, Carmel, IN;
Jayakumar Pon SAMUEL, Carmel, IN;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

CORTEVA AGRISCIENCE LLC, Indianapolis, IN;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.