



Industria y Comercio
SUPERINTENDENCIA

POT
SOLICITUD

PATENTE DE INVENCION

03-22847

21 EXPEDIENTE N°

54 TÍTULO DERIVADOS TIAZOL DE 2-METOKIDIMINO-2-(PINDIDILOKIDETIL)-

~~VENTA~~ ACTUANDAS UTILES COMO FURACIDAS

51. CLASIFICACIÓN INTERNACIONAL A01N 43/30; C07D 417/04

71. SOLICITANTE DOW AGROSCIENCES LLC

DOMICILIO Indianapolis, Indiana, Estados Unidos de América.

74 APODERADO ENILLO FERRERO

Código No. 1092

22 BOGOTÁ, D. C. 18/03/2003

9

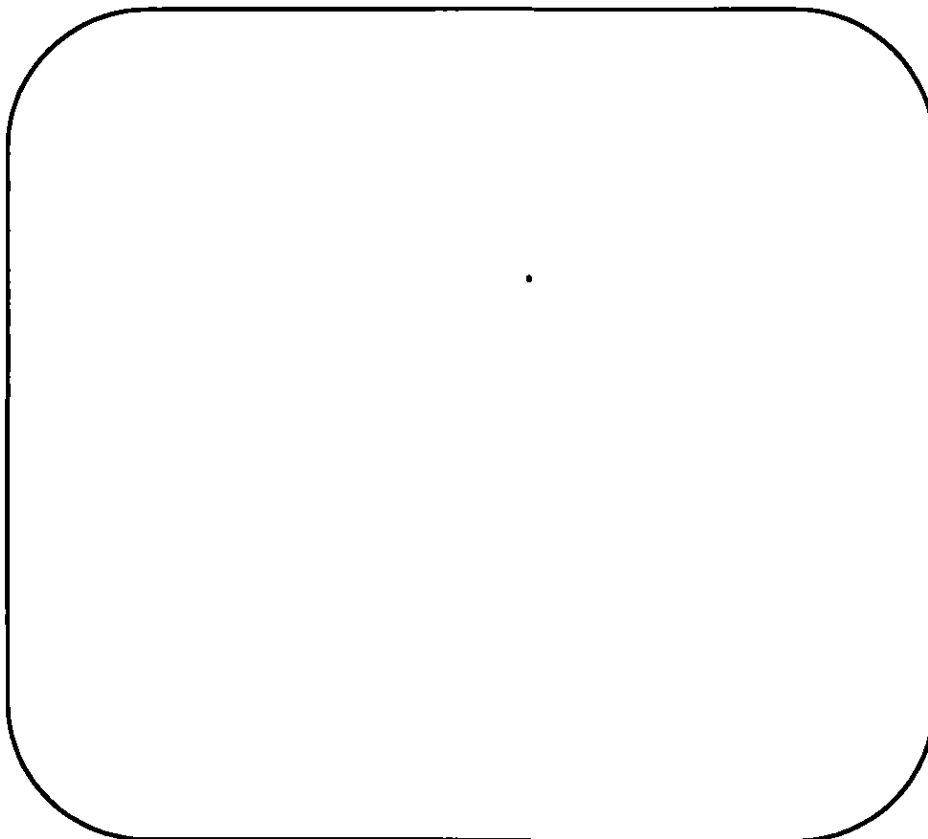
Comprobante de pago No.: 03-17.218 Fecha: 10 de marzo de 2002

10

Anexos:

- ☒ Comprobante de pago de la tasa de presentación de la solicitud por \$ 400.000.00.
- ☐ Comprobante de pago por reivindicación de prioridad.
- ☒ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso.
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones.
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Arte final 12x12
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ Otros

11

FIGURA CARACTERISTICA:

12

Solicito la concesión de la patente,

NOMBRE: EMILIO FERRERO

FIRMA : 
C.C. 438.019 de Usaquén T.P. 31.929



MRE/mrm-ld-127

1077J
62284

CAVELIER
ABOGADOS
EDIFICIO SISKI
CARRERA 4ª N° 72-35
BOGOTÁ, S - COLOMBIA

For patents, utility models, industrial designs, trademarks, commercial names, trade emblems, slogans.

Para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, lemas comerciales.

REPRESENTACION, RATIFICACION Y PODER

REPRESENTATION, RATIFICATION AND POWER OF ATTORNEY

I (we), the undersigned / Yo (nosotros), abajo firmado (s)
Dow AgroSciences LLC

of/domiciliado (s) en **9330 Zionsville Road,
Indianapolis, Indiana 46268, United
States of America,**

por el presente ratificamos la _____

presentada por _____

como agente oficioso ante _____

en _____

el _____
y por el presente nombramos a **GERMAN CAVELIER**, tpa. 832; **GONZALO PERDOMO**, tpa. 831; **EMILIO FERRERO**, tpa. 31929; y **LUZ CLEMENCIA DE PAEZ**, tpa. 23555; domiciliados en la Carrera 4ª N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el parágrafo 1º del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como tales (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplente, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa o judicial, nulidad,

herby ratify the _____

filed without a Power of Attorney by _____

before _____

in _____

on _____
and do hereby appoint **GERMAN CAVELIER**, tpa. 832; **GONZALO PERDOMO**, tpa. 831; **EMILIO FERRERO**, tpa. 31929; and **LUZ CLEMENCIA DE PAEZ**, tpa. 23555; domiciled at Carrera 4ª N° 72-35, Bogotá, Colombia, in due compliance with the terms of Paragraph 1st. of Article 543 of the Commercial Code, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn occurs, the representation can be taken again in their sequence, by the principal, the first, or second alternate depending on cases, and the more factor, its exercise will suffice. The exercise of the representation by the first, second or third alternate in their turn shall end at such time.

In addition, we grant a Power of Attorney in favor of the above-named attorneys-at-law so that they may obtain the protection of my (our) industrial property and against the unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative contentious and judicial, as well as before Arbitration Court, in all matters concerning the following: a) Obtainment of patents, utility models and industrial designs; the registration of trademarks, collective, defensive and service marks, slogans, commercial names, trade emblems, vegetal varieties and denominations of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of

A la vuelta →

Over →

CAVELIER ABOGADOS
WPPODERE-21 (MINUTA N° 12.1.1.29.r USA)

medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso-administrativos relacionados con estos derechos, acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistirse, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos

unfair competition, protection to the consumer oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus the protection of trade secrets, and in general the civil, penal, and administrative suits relating to those rights, actions and suits instituted by me (us) or against me (us) And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney

Given and signed this/Dado y firmado hoy _____

February 6, 1998

in/en Indianapolis, Indiana 46268

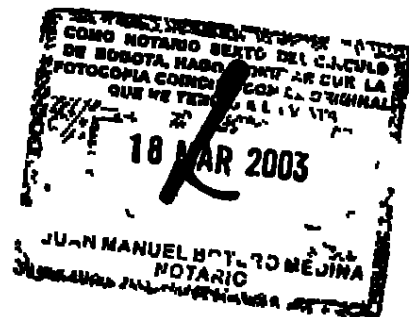
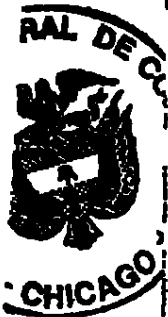
United States of America

Kenneth L. Loertscher

Signature

Firma

Kenneth L. Loertscher
Assistant Secretary
& General Patent Counsel





Consulado General de Colombia

500 NORTH MICHIGAN AVENUE SUITE 2040
CHICAGO ILLINOIS 60611

TEL (312) 923 1188 FAX (312) 923-1187

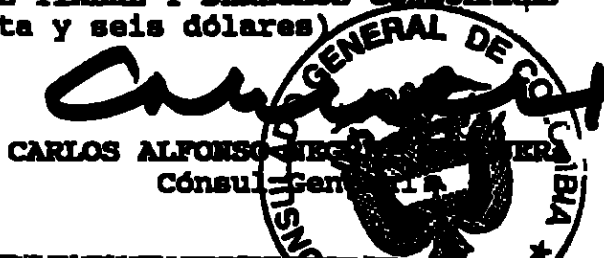
No 254

Chicago, FEB 20 1998

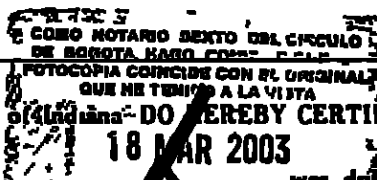
El suscrito Cónsul General de Colombia, CERTIFICA, que el señor (a) MARY REEVER, quien como SECRETARIA DELEGADA ESTADO, IN, autenticó la firma del signatario del poder precedente, ejercía en la fecha las funciones indicadas y su firma corresponde a la registrada en este Consulado, que la compañía DOW AGROSCIENCES LLC es una sociedad constituida de acuerdo con las leyes de DELAWARE y cumple su objeto conforme a las mismas; que el (a) señor (a) KENNETH L. LOERTSCHER, quien en su carácter de REPRESENTANTE LEGAL de la citada compañía confiere el poder precedente, es su representante legal en este país.

El Cónsul General no asume responsabilidad alguna por el contenido del documento

PAGADO IMPUESTO DE TIMBRE Y DERECHOS CONSULARES
US\$56 oo (Cincuenta y seis dólares)



UNITED STATES OF AMERICA
CERTIFICATE OF OFFICE
STATE OF INDIANA



I, Sue Anne Gilroy Secretary of State of Indiana DO HEREBY CERTIFY That
according to records on file in my office, Lydia S. Owens was duly elected
or appointed to the office of Notary Public and for Hendricks County
and that the term of said office included the date of February 6, 1998 that to all his/her official acts as said offi

cial full faith and credit ought to be given in all Courts of
Justice and elsewhere. In testimony whereof I have here unto
set my hand and affixed the Great Seal of the State of Indiana,
at Indianapolis, this Tenth day of
February 1998



Sue Anne Gilroy
Secretary of State
by Mary Reever
Deputy

MINISTERIO DE RELACIONES
EXTERIORES

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

1998 MAR 11 11 55

JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTÁ C

321220
FIRMAR APARECE EN EL
PUEBLO DESLEMPERA
FUNCIONES INDICADAS

Donato R. de Martines
Traductora e Interprete Oficial
Residencia 623 Mayaguez 1001

14 MAR 2005
MANUS: POST-PROCESING

CERTIFICADO NOTARIAL (INDIVIDUO)

A los 6 días del mes de FEBRERO de 19 98
ante mí, Notario Público de ESTADO DE INDIANA
comparció(eron) personalmente KENNETH L LOERTSCHER

a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo.

Notario Público — Notary Public

CERTIFICADO NOTARIAL (SOCIEDAD)

Hoy, 6 de FEBRERO de 19 98
comparció(eron) ante mí
KENNETH L LOERTSCHER
a quien(es) conozco personalmente y que firma(n) este documen
to en representación de la Sociedad/compañía
denominada Dow AgroSciences LLC

Certifico:

1 Que he visto los siguientes documentos*
CERTIFICADO DE CONSTITUCION, FECHADO 1 JULIO 1997
CERTIFICADO DE MODIFICACION, FECHADO 1 OCT 1997
RESOLUCION JUNTA DIRECTIVA, FECHADO 23 OCT, 1997
CONSENTIMIENTO ESCRITO DE LA JUNTA, 1 JULIO 1997

2. Que dichos documentos prueban lo siguiente

2.1 Que Dow AgroSciences LLC

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de 1 Estado de Delaware,
Estados Unidos de América

2.2. Que el domicilio de dicha Sociedad/Compañía es
9330 Zionsville Road, Indianapolis, Indiana
46268, Estados Unidos de América.

2.3. Que el objeto u objeto para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.4 Que el(los) Sr.(Sres.) KENNETH L LOERTSCHER
SECRETARIO ASISTENTE y ASESOR LEGAL PATENTES

está(n) autorizado(s) para otorgar el presente Poder

Ciudad INDIANAPOLIS

Estado INDIANA

Hoy 6 FEB de 19 98

Notario Público — Notary Public

* Los documentos deben identificarse con fecha y origen.

NOTARIAL CERTIFICATE (INDIVIDUAL)

On this 6th day of February 19 98
before me, a Notary Public of State of Indiana
personally appeared Kenneth L Loertscher

to me known, and known to me to be the person(s) who
executed that foregoing document, and who has(have) legal
capacity to execute it.

NOTARIAL CERTIFICATE (CORPORATION)

On this 6th day of February 19 98
appeared before me
Kenneth L. Loertscher
who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company Limited
Liability
named Dow AgroSciences LLC Company.

I Certify

1 That I have seen the following documents*

Certificate of formation, dated July 1, 1997
Certificate of amendment, dated October 1, 1997
Board resolution, dated October 23, 1997
Board written consent, dated July 1, 1997

2. That the above documents duly prove the following:

2.1 That Dow AgroSciences LLC
Limited Liability
is a Corporation/Company legally constituted and in existence

in accordance with the laws of the State of Delaware,
United States of America

2.2. That the domicile of said Corporation/Company is
9330 Zionsville Road, Indianapolis, Indiana
46268, United States of America.

2.3. That the purpose of purposes for which the present Power
of Attorney is granted are comprised within the corporation
purposes set forth in the charter of the mentioned
Corporation/Company Limited liability company

2.4 That Mr (Messrs.) Kenneth L. Loertscher
Assistant Secretary and General Patent Counsel

is(are) authorized to grant the present Power of Attorney

City Indianapolis

State Indiana

This 6th day of Feb 19 98

Lydia S Owens

Lydia S Owens
Notary Public State of Indiana
Hendricks County
My Commission Expires 03/05/00

* Documents must be identified with date and origin.

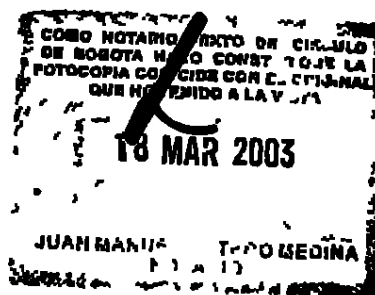
**CERTIFICACION NOTARIAL
Y AUTENTICACION CONSULAR**

- 1 Es necesaria la legalización con certificado notarial. El Notario Público debe certificar
 - 1.1 Que la compañía está legalmente constituida y actualmente existente
 - 1.2 Su domicilio.
 - 1.3 Que el propósito del poder está incluido en el objeto social de la compañía.
 - 1.4 Que el poderdante está autorizado para dar el poder en nombre de la compañía
- 2 Los documentos que hay que mostrarle al Notario Público para probar los puntos anteriores, deben estar expresados en el Certificado Notarial con fecha y origen.
 - 2.1 Respecto a los puntos 1.1, 1.2 y 1.3 sugerimos referirse a los artículos de constitución con fecha y lugar de otorgamiento; y
 - 2.2 Para el punto 1.4 sugerimos mencionar la resolución de la Junta Directiva o los estatutos, según los cuales la persona que otorga el poder está autorizada para ello
3. Enseguida el Señor Cónsul de Colombia debe autenticar la firma del Notario Público.

**NOTARIAL CERTIFICATION AND
CONSULAR AUTENTIFICATION**

- 1 Notarial legalization is necessary The Notary Public must certify
 - 1.1 That the company is legally constituted and presently existent.
 - 1.2 Its place of business.
 - 1.3 That the purpose of the Power-of-Attorney is included in the activities of the company
 - 1.4 That the grantor is empowered to give the Power of Attorney in the name of the company he represents.
- 2 The documents which the Notary Public had before him to prove the above points must be listed by him in the Notarial Certificate with dated and origin
 - 2.1 In connection with points 1.1, 1.2, and 1.3 we suggest referring to the articles of incorporation with date and place of execution.
 - 2.2 For point 1.4 we suggest to mention the resolution of the Board of Directors and/or the by-laws whereby the person who grants the Power of Attorney has been authorized to give it.
3. Then the Colombian Consul must legalize the signature of the Notary Public

NOTA PARA EL SEÑOR CONSUL COLOMBIANO Según el artículo 259 del C de P.C. el Señor Cónsul debe autenticar la última precedente autenticación



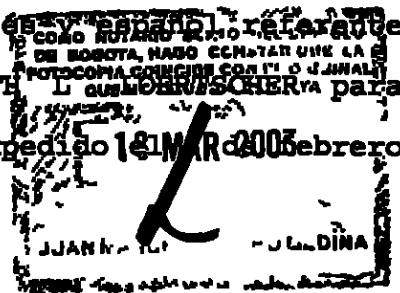
TRADUCCION OFICIAL No 03 075 98 de un documento escrito en inglés el cual para su identificación se sella con el sello del Traductor al mismo tiempo que la presente Esta traducción ha sido preparada por Bernarda R de Martínez, Traductora Oficial debidamente reconocida por el Ministerio de Relaciones Exteriores y aprobada por el Ministerio de Justicia de Colombia mediante Resolución No 683 de 1991

(Se traducen sellos y legalizaciones que aparecen a continuación de un documento escrito en inglés y español por medio del cual Dow AgroSciences LLC, otorga Poder a favor de GERMAN CAVELIER, GONZALO PERDOMO, EMILIO FERRERO y LUZ CLEMENCIA DE PAEZ)

Dado y firmado hoy 6 de febrero de 1998, en Indianápolis, Indiana, E E U U , por Kenneth L Loertscher, Subsecretario y Asesor General de Patentes

(Sellos parciales en tinta del Consulado General de Colombia en Chicago)

CERTIFICADO NOTARIAL (INDIVIDUO), en inglés y español referente a la capacidad legal que tenía KENNETH L. LOERTSCHER para otorgar el documento antes mencionado, expedido el 6 de febrero de 1998 en el Estado de Indiana



CERTIFICADO NOTARIAL (SOCIEDAD), en inglés y español referente a la existencia legal de la sociedad Dow AgroSciences LLC, expedido en la Ciudad de Indianápolis, Indiana, E E U U , el 6 de febrero de 1998

(Firmado), Lydia S Owens, Notario Público

(Sello notarial en tinta), LYDIA S OWENS Notario Público,
Estado de Indiana, Condado de Hendricks Mi comisión expira el
03/05/00

(Sello notarial seco), LYDIA S OWENS NOTARIO PUBLICO INDIANA

(Sello parcial en tinta del Consulado General de Colombia en
Chicago)

ESTADO UNIDOS DE AMERICA

CERTIFICADO DEL CARGO

ESTADO DE INDIANA

Yo, SUE ANN GILROY, Secretario de Estado de Indiana, POR EL
PRESENTE CERTIFICO que, de acuerdo con los archivos que obran
en mi oficina, LYDIA S OWENS fue debidamente elegido y
nombrado para el cargo de NOTARIO PUBLICO en y para el Condado
de Hendricks y que el término de dicho cargo incluía la fecha
del 6 de febrero de 1998 que a todos sus actos oficiales se
les debe dar completa fe y crédito dentro y fuera de todas las
Corte de Justicia EN TESTIMONIO DE LO CUAL, he firmado y
estampado el Gran Sello del Estado de Indiana en Indianapolis,
hoy 10 de febrero de 1998

(Firma facsimilar), Sue Ann Gilroy

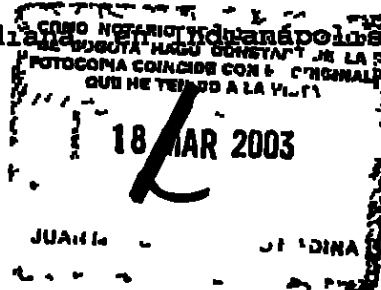
Secretario de Estado

(Firmado),

Por Mary Reeve

Suplente

(Adherido se encuentra sello de oblea dorado con texto en
relieve), SELLO DEL ESTADO DE INDIANA 1816



(Sello parcial en tinta del Consulado General de Colombia en Chicago)

(En español), Certificación de la firma y cargo de MARY REEVER, de la existencia legal de la compañía DOW AGROSCIENCES LLC y de la autoridad que tenía su representante Legal, KENNETH L LOERTSCHER, para otorgar el poder mencionado arriba Esta certificación fue expedida por el CONSULADO GENERAL DE COLOMBIA EN CHICAGO, ILLINOIS, bajo el N° 254, de fecha 20 de febrero de 1998 y firmada por Carlos Alfonso Negret Mosquera, Cónsul General Pagados Impuesto de Timbre y Derechos Consulares por valor de veintiún dólares

(Sello parcial en tinta del Consulado General de Colombia en Chicago)

(al dorso), Legalización de la firma que antecede expedida el MINISTERIO DE RELACIONES EXTERIORES bajo el No. 221220, de fecha 11 de marzo de 1998 y firmada por el Jefe de Legalizaciones

Es traducción fiel y completa de la cual se deja copia en los archivos de esta oficina para su confrontación y la cual se remito

Bogotá, 17 de marzo de 1998

COLO 6641-801-001-3

BRM 137

18 MAR 2003
Bernarda R de Martínez
Traductora e Interprete Oficial
Resolución 663 Ministerio 1994

COMO NOTARIO SEXTO DEL CIRCULO DE S. A. TAFE DE
BOGOTA, HAGO CONSTAR QUE LA(S) ANTE-ION()S, FIR
MA(S) PUESTA(S) POR

[Signature]

IDENTIFICADOS CC. C. C. N. ()

Edición AUTENTICA(S)

SANTAFE DE BOGOTA 17 MAR 1998



BO DE ADOBE
RESPONSABILIDAD DEL TEXTO

98 MAR 18 AM 11 56

JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTA D.C.

COMO NOTARIO SEXTO DEL CIRCULO
DE BOGOTA, HAGO CONSTAR QUE LA
FOTOCOPIA COINCIDE CON EL ORIGINAL
QUE HE TENIDO A LA VISTA
18 MAR 2003
JUAN MA. L.
BOGOTA

MINISTERIO DE RELACIONES
EXTERIORES

02268 D

CUYA FIRMA APARECE EN
DOCUMENTO DESEMPAÑADO
LAS FUNCIONES INDICADAS

12

CAVELIER

AB GAD S

TENET 3
CABLES CAVELEYES
TELEX 45479 CAVE CO
TELEX (23) 7407375 CAVE UC

EDIFICIO SISKI
CARRERA 4 No. 72 35
BOGOTA 8 COLOMBIA

TELEFONOS (57) (1) 347 36 11
(57) (1) 212-01 00
TELEFAX (57) (1) 217 92 11
(57) (1) 235 88 50

Señor Jefe de la
DIVISION DE NUEVAS CREACIONES
Superintendencia de Industria y Comercio
E S D

Poderdante DOW AGROSCIENCES LLC

Poder conferido el 06-02-98

Yo, GERMAN CAVELIER, obrando en mi calidad de apoderado principal del poderdante arriba mencionado, atentamente manifiesto a Usted que sustituyo el poder que me ha sido conferido en la persona del doctor EMILIO FERRERO, Abogado con Tarjeta Profesional No 31 929, con todas las facultades que me fueron conferidas

Hago la anterior sustitucion conforme al articulo 66 delCodigo de Procedimiento Civil ya que los otros sustitutos faltan en este momento

Señor Jefe,


GERMAN CAVELIER

T P A No 832

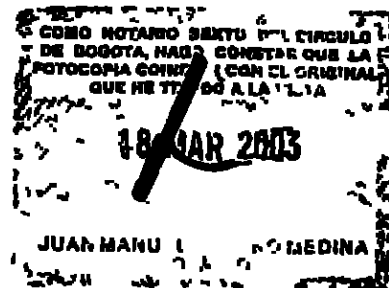
C C No 2 877 924 de Bogota

Acepto


EMILIO FERRERO

T P A No 31 929

C C No 438 019 de Usaquen



2e-780-2

E-MAIL C USA A TELEMAL, O SPRINTCOL, FN CAVE SN ABO

INTERNET CAVE.ABO@sprintcol.sprint.com

VIT 860.041 367 3

NOTARIA SEXTA DE BOGOTA

RECONOCIMIENTO Y PRESENTACION PERSONAL

S. D. C. 25 FEB 1998

PARLO MENDEZ BARAJAS S

NOTARIO SEXTO ENCARGADO DEL CIRCULO DE BOGOTA

Compania (s) (s) C. C.

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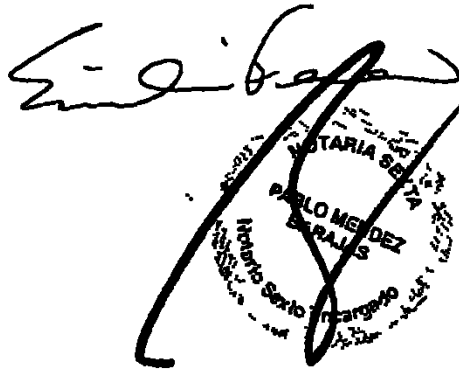
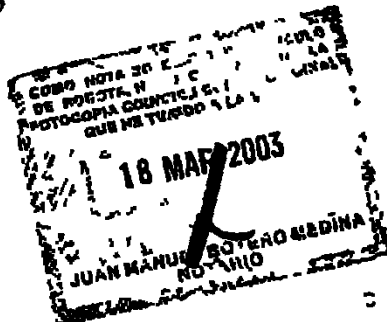
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(54) Title THIAZOLE DERIVATIVES OF 2-METHOXYIMINO-2-(PYRIDINYLOXYMETHYL)-PHENYL-ACETAMIDES
USEFUL AS FUNGICIDES

(57) Abstract. The present invention provides 2-methoxyimino 2(pyridinyloxymethyl) phenyl acetamides with a isothiazolyl ring on the pyridine ring according to formula (I) as well as their use as fungicidal compounds.

THIAZOLE DERIVATIVES OF 2-METHOXYIMINO-2-(PYRIDINYLOXYMETHYL)-PHENYL-ACETAMIDES
USEFUL AS FUNGICIDES

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PRIORITY

This application claims priority from U.S. provisional application 60/233,781 which
10 was filed on September 19, 2001.

FIELD OF THE INVENTION

This invention is related to the field of compounds having fungicidal activity and
processes to make and use such compounds.

15

BACKGROUND OF THE INVENTION

Our history is riddled with outbreaks of fungal diseases that have caused widespread
human suffering. One need look no further than the Irish potato famine of the
1850's, where an estimated 1,000,000 people died, to see the effects of a fungal
20 disease.

Fungicides are compounds, of natural or synthetic origin, which act to protect plants
against damage caused by fungi. Current methods of agriculture rely heavily on the
use of fungicides. In fact, some crops cannot be grown usefully without the use of
25 fungicides.

Using fungicides allows a grower to increase the yield of the crop and consequently,
increase the value of the crop. In most situations, the increase in value of the crop is
worth at least three times the cost of the use of the fungicide. However, no one
30 fungicide is useful in all situations.

Consequently, research is being conducted to produce fungicides that are safer, that
have better performance, that are easier to use, and that cost less. In light of the
above, the inventors provide this invention.

5

SUMMARY OF THE INVENTION

It is an object of this invention to provide compounds that have fungicidal activity.

It is an object of this invention to provide processes that produce compounds that have fungicidal activity.

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It is an object of this invention to provide processes that use compounds that have fungicidal activity.

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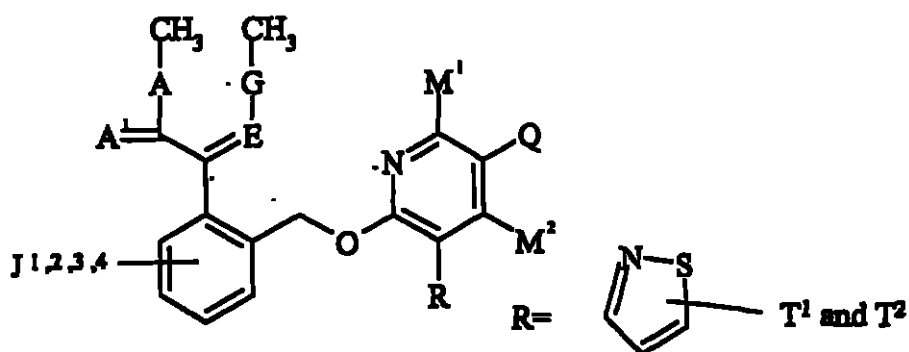
In accordance with this invention, processes to make and processes to use compounds having a general formula according to formula one, and said compounds are provided.

20

While all the compounds of this invention have fungicidal activity, certain classes of compounds may be preferred for reasons such as, for example, greater efficacy or ease of synthesis.

DETAILED DESCRIPTION OF THE INVENTION

The compounds have a formula according to formula one. In formula one:



Formula One

25 A is selected from the group consisting of oxy (-O-) and amino (-NH-);

A¹ is selected from the group consisting of oxo (O=) and thioxo (S=);

E is selected from the group consisting of aza (-N=) and methine (-CH=);

5 J¹, J², J³, and J⁴ are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ alkyl (mono or multi- halo), and C₁₋₄ alkylthio;

10 M¹, and M² are selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₄ alkyl (mono or multi- halo), and C₁₋₄ alkylthio, nitro (-NO₂), (mono or multi- halo) C₁₋₄ alkoxy, aryl (-Aryl), substituted aryl (-SAryl), heteroaryl (-HAryl), and substituted heteroaryl (-SHAryl), where "aryl" or "Ph" refers to a phenyl group and where "heteroaryl" refers to pyridyl, pyridinyl, pyrazinyl or pyridazinyl, and where said SAryl and SHAryl have substituents that
15 are independently selected from the group consisting C_{1-C₆} alkyl, C_{1-C₆} alkoxy, halo-C_{1-C₆} alkyl, halo-C_{1-C₆} alkoxy, halo, nitro, carbo-C_{1-C₆} alkoxy, or cyano, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino, preferably, hydro (-H), C_{1-C₆} alkyls, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino where said substituted amino has substituents that are independently selected from the group
20 consisting of hydro (-H), alkyl, arylalkyl, alkanoyl, benzoyl, and amino;

Q is selected from the group consisting of hydro, halo, cyano, (mono or multi halo) C₁₋₆ alkyl, and C₁₋₆ alkyl; and

25 T¹ and T² are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₄ alkyl (mono or multi- halo), and C₁₋₄ alkylthio, nitro (-NO₂), (mono or multi- halo) C₁₋₄ alkoxy, aryl (-Aryl), substituted aryl (-SAryl), heteroaryl (-HAryl), and substituted heteroaryl (-SHAryl), where "aryl" or "Ph" refers to a phenyl group and where "heteroaryl" refers to
30 pyridyl, pyridinyl, pyrazinyl or pyridazinyl, and where said SAryl and SHAryl have substituents that are independently selected from the group consisting C_{1-C₆} alkyl, C_{1-C₆} alkoxy, halo-C_{1-C₆} alkyl, halo-C_{1-C₆} alkoxy, halo, nitro, carbo-C_{1-C₆} alkoxy, or cyano, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino, preferably, hydro (-H), C_{1-C₆} alkyls, arylalkyl, alkanoyl, benzoyl, amino, and

- 5 substituted amino where said substituted amino has substituents that are independently selected from the group consisting of hydro (-H), alkyl, arylalkyl, alkanoyl, benzoyl, and amino. C₁₋₄ alkyl or one of the single bonds can be the connecting bond to the pyridyl.
- 10 The term "alkyl", "alkenyl", or "alkynyl" refers to an unbranched or branched chain carbon group. The term "alkoxy" refers to an unbranched or branched chain alkoxy group. The term "haloalkyl" refers to an unbranched or branched alkyl group substituted with one or more halo atoms. The term "haloalkoxy" refers to an alkoxy group substituted with one or more halo atoms. Throughout this document, all
- 15 temperatures are given in degrees Celsius and all percentages are weight percentages, unless otherwise stated. The term "Me" refers to a methyl group. The term "Et" refers to an ethyl group. The term "Pr" refers to a propyl group. The term "Bu" refers to a butyl group. The term "EtOAc" refers to ethyl acetate. The term "DMSO" refers to dimethylsulfoxide. The term "Ether", when used in the body of
- 20 text under "Preparation", refers to diethyl ether. The term "ppm" refers to parts per million. The term, "psi" refers to pounds per square inch.

In general, these compounds can be used in a variety of ways. These compounds are preferably applied in the form of a formulation comprising one or more of the

25 compounds with a phytolegically acceptable carrier. Concentrated formulations can be dispersed in water, or another liquid, for application, or formulations can be dust-like or granular, which can then be applied without further treatment. The formulations are prepared according to procedures which are conventional in the agricultural chemical art, but which are novel and important because of the presence

30 therein of one or more of the compounds.

The formulations that are applied most often are aqueous suspensions or emulsions. Either such water-soluble, water suspendable, or emulsifiable formulations are solids, usually known as wettable powders, or liquids, usually known as

16

5 emulsifiable concentrates, aqueous suspensions, or suspension concentrates. The present invention contemplates all vehicles by which one or more of the compounds can be formulated for delivery and use as a fungicide.

As will be readily appreciated, any material to which these compounds can be added
10 may be used, provided they yield the desired utility without significant interference with the activity of these compounds as antifungal agents.

Wettable powders, which may be compacted to form water dispersible granules, comprise an intimate mixture of one or more of the compounds, an inert carrier and
15 surfactants. The concentration of the compound in the wettable powder is usually from about 10% to about 90% w/w, more preferably about 25% to about 75% w/w. In the preparation of wettable powder formulations, the compounds can be compounded with any of the finely divided solids, such as prophylite, talc, chalk, gypsum, Fuller's earth, bentonite, attapulgite, starch, casein, gluten, montmorillonite
20 clays, diatomaceous earths, purified silicates or the like. In such operations, the finely divided carrier is ground or mixed with the compounds in a volatile organic solvent. Effective surfactants, comprising from about 0.5% to about 10% of the wettable powder, include sulfonated lignins, naphthalenesulfonates, alkylbenzenesulfonates, alkyl sulfates, and non-ionic surfactants, such as ethylene
25 oxide adducts of alkyl phenols.

Emulsifiable concentrates of the compounds comprise a convenient concentration, such as from about 10% to about 50% w/w, in a suitable liquid. The compounds are dissolved in an inert carrier, which is either a water miscible solvent or a mixture of
30 water-immiscible organic solvents, and emulsifiers. The concentrates may be diluted with water and oil to form spray mixtures in the form of oil-in-water emulsions. Useful organic solvents include aromatics, especially the high-boiling naphthalenic and olefinic portions of petroleum such as heavy aromatic naphtha. Other organic solvents may also be used, such as, for example, terpenic solvents,

- 5 including rosin derivatives, aliphatic ketones, such as cyclohexanone, and complex alcohols, such as 2-ethoxyethanol.

Emulsifiers which can be advantageously employed herein can be readily determined by those skilled in the art and include various nonionic, anionic, cationic
10 and amphoteric emulsifiers, or a blend of two or more emulsifiers. Examples of nonionic emulsifiers useful in preparing the emulsifiable concentrates include the polyalkylene glycol ethers and condensation products of alkyl and aryl phenols, aliphatic alcohols, aliphatic amines or fatty acids with ethylene oxide, propylene oxides such as the ethoxylated alkyl phenols and carboxylic esters solubilized with
15 the polyol or polyoxyalkylene. Cationic emulsifiers include quaternary ammonium compounds and fatty amine salts. Anionic emulsifiers include the oil-soluble salts (e.g., calcium) of alkylaryl sulphonic acids, oil soluble salts or sulphated polyglycol ethers and appropriate salts of phosphated polyglycol ether.

20 Representative organic liquids which can be employed in preparing the emulsifiable concentrates of the present invention are the aromatic liquids such as xylene, propyl benzene fractions; or mixed naphthalene fractions, mineral oils, substituted aromatic organic liquids such as dioctyl phthalate; kerosene; dialkyl amides of various fatty acids, particularly the dimethyl amides of fatty glycols and glycol derivatives such
25 as the n-butyl ether, ethyl ether or methyl ether of diethylene glycol, and the methyl ether of triethylene glycol. Mixtures of two or more organic liquids are also often suitably employed in the preparation of the emulsifiable concentrate. The preferred organic liquids are xylene, and propyl benzene fractions, with xylene being most preferred. The surface-active dispersing agents are usually employed in liquid
30 formulations and in the amount of from 0.1 to 20 percent by weight of the combined weight of the dispersing agent with one or more of the compounds. The formulations can also contain other compatible additives, for example, plant growth regulators and other biologically active compounds used in agriculture.

12

5 Aqueous suspensions comprise suspensions of one or more water-insoluble compounds, dispersed in an aqueous vehicle at a concentration in the range from about 5% to about 50% w/w. Suspensions are prepared by finely grinding one or more of the compounds, and vigorously mixing the ground material into a vehicle comprised of water and surfactants chosen from the same types discussed above.

10 Other ingredients, such as inorganic salts and synthetic or natural gums, may also be added to increase the density and viscosity of the aqueous vehicle. It is often most effective to grind and mix at the same time by preparing the aqueous mixture and homogenizing it in an implement such as a sand mill, ball mill, or piston-type homogenizer.

15

The compounds may also be applied as granular formulations, which are particularly useful for applications to the soil. Granular formulations usually contain from about 0.5% to about 10% w/w of the compounds, dispersed in an inert carrier which consists entirely or in large part of coarsely divided attapulgite, bentonite, diatomite,

20 clay or a similar inexpensive substance. Such formulations are usually prepared by dissolving the compounds in a suitable solvent and applying it to a granular carrier which has been preformed to the appropriate particle size, in the range of from about 0.5 to about 3 mm. Such formulations may also be prepared by making a dough or paste of the carrier and the compound, and crushing and drying to obtain the desired

25 granular particle.

Dusts containing the compounds are prepared simply by intimately mixing one or more of the compounds in powdered form with a suitable dusty agricultural carrier, such as, for example, kaolin clay, ground volcanic rock, and the like. Dusts can

30 suitably contain from about 1% to about 10% w/w of the compounds.

The formulations may contain adjuvant surfactants to enhance deposition, wetting and penetration of the compounds onto the target crop and organism. These adjuvant surfactants may optionally be employed as a component of the formulation or as a tank mix. The amount of adjuvant surfactant will vary from 0.01 percent to

5 1.0 percent v/v based on a spray-volume of water, preferably 0.05 to 0.5 %. Suitable adjuvant surfactants include ethoxylated nonyl phenols, ethoxylated synthetic or natural alcohols, salts of the esters or sulphosuccinic acids, ethoxylated organosilicones, ethoxylated fatty amines and blends of surfactants with mineral or vegetable oils.

10

The formulations may optionally include combinations that can comprise at least 1% of one or more of the compounds with another pesticidal compound. Such additional pesticidal compounds may be fungicides, insecticides, nematocides, miticides, arthropodicides, bactericides or combinations thereof that are compatible
15 with the compounds of the present invention in the medium selected for application, and not antagonistic to the activity of the present compounds. Accordingly, in such embodiments the other pesticidal compound is employed as a supplemental toxicant for the same or for a different pesticidal use. The compounds and the pesticidal compound in the combination can generally be present in a weight ratio of from
20 1:100 to 100:1

The present invention includes within its scope methods for the control or prevention of fungal attack. These methods comprise applying to the locus of the fungus, or to a locus in which the infestation is to be prevented (for example
25 applying to cereal or grape plants), a fungicidal amount of one or more of the compounds. The compounds are suitable for treatment of various plants at fungicidal levels, while exhibiting low phytotoxicity. The compounds are useful in a protectant or eradicator fashion. The compounds are applied by any of a variety of known techniques, either as the compounds or as formulations comprising the
30 compounds. For example, the compounds may be applied to the roots, seeds or foliage of plants for the control of various fungi, without damaging the commercial value of the plants. The materials are applied in the form of any of the generally used formulation types, for example, as solutions, dusts, wettable powders, flowable

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- 5 concentrates, or emulsifiable concentrates. These materials are conveniently applied in various known fashions.

The compounds have been found to have significant fungicidal effect particularly for agricultural use. Many of the compounds are particularly effective for use with
10 agricultural crops and horticultural plants, or with wood, paint, leather or carpet backing.

In particular, the compounds effectively control a variety of undesirable fungi that infect useful plant crops. Activity has been demonstrated for a variety of fungi,
15 including for example the following representative fungi species:

- Downy Mildew of Grape (*Plasmopara viticola* - PLASVD);
Late Blight of Tomato (*Phytophthora infestans* - PHYTIN);
Apple Scab (*Venturia inaequalis* - VENTIN);
Brown Rust of Wheat (*Puccinia recondita* - PUCCRT);
20 Stripe Rust of Wheat (*Puccinia striiformis* - PUCCST);
Rice Blast (*Pyricularia oryzae* - PYRIOR);
Cercospora Leaf Spot of Beet (*Cercospora beticola* - CERCBE);
Powdery Mildew of Wheat (*Erysiphe graminis* - ERYSGT);
Leaf Blotch of Wheat (*Septoria tritici* - SEPTTR);
25 Sheath Blight of Rice (*Rhizoctonia solani* - RHIZSO);
Eyespot of Wheat (*Pseudocercospora herpotrichoides* - PSDCHE);
Brown Rot of Peach (*Monilinia fructicola* - MONIFC); and
Glume Blotch of Wheat (*Septoria nodorum* - LEPTNO).

- 30 It will be understood by those in the art that the efficacy of the compound for the foregoing fungi establishes the general utility of the compounds as fungicides.

The compounds have broad ranges of efficacy as fungicides. The exact amount of the active material to be applied is dependent not only on the specific active material being applied, but also on the particular action desired, the fungal species to be

5 controlled, and the stage of growth thereof, as well as the part of the plant or other product to be contacted with the compound. Thus, all the compounds, and formulations containing the same, may not be equally effective at similar concentrations or against the same fungal species.

10 The compounds are effective in use with plants in a disease inhibiting and phytologically acceptable amount. The term "disease inhibiting and phytologically acceptable amount" refers to an amount of a compound that kills or inhibits the plant disease for which control is desired, but is not significantly toxic to the plant. This amount will generally be from about 1 to about 1000 ppm, with 10 to 500 ppm
 15 being preferred. The exact concentration of compound required varies with the fungal disease to be controlled, the type of formulation employed, the method of application, the particular plant species, climate conditions, and the like. A suitable application rate is typically in the range from about 0.10 to about 4 pounds/acre.

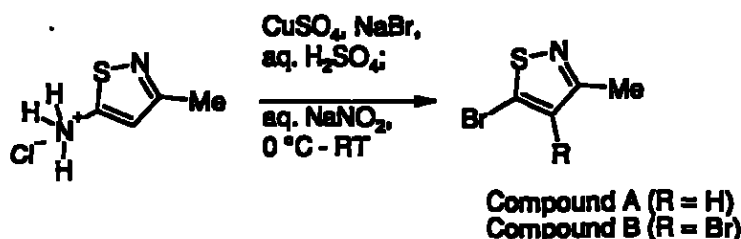
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EXAMPLES

These examples are provided to further illustrate the invention. They are not meant to be construed as limiting the invention.

Preparation of 5-bromo-3-methylisothiazole (Compound A) and 4,5-dibromo-3-methyliso-thiazole (Compound B)

25



5-Amino-3-methylisothiazole hydrochloride (1.0 g; 6.7 mmol) was dissolved in 9M sulfuric acid (13.4 mL) at RT. Copper(II)sulfate (2.7 g; 16.8 mmol; 2.5 eq) and
 30 sodium bromide (2.4 g; 23.5 mmol; 3.5 eq) were added, and the resulting thick

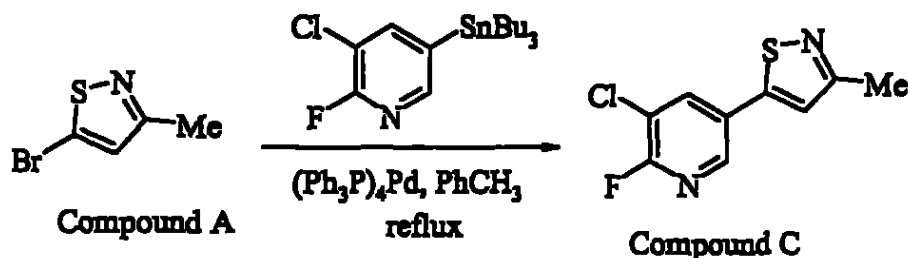
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5 mixture was cooled to 0 °C in an ice-salt bath. A solution of sodium nitrite (5.8 mg; 7.4 mmol; 1.1 eq) in water (2.5 mL) was added slowly dropwise keeping the internal temperature < 10 °C. When the addition was complete, stirring continued at 0 °C for 20 minutes and then at RT for 30 minutes until nitrogen evolution was no longer visible. The reaction mixture was poured into water (exotherm) where it stirred
10 until most of the solids dissolved. It was transferred to a separatory funnel and extracted with diethyl ether (x 3). The combined organic layers were washed with brine and dried over sodium sulfate. After careful removal of solvent (no heat) the crude residue was purified by flash chromatography (5% ethyl acetate/hexanes) to give Compound A (confirmed by GCMS, m/e 179) in 28% yield (330 mg) and
15 Compound B (m/e 257) in a smaller amount (yield not measured).

Preparation of 4,5-dibromo-3-methyliso-thiazole (Compound B) Method Two. 5-Amino-3-methylisothiazole hydrochloride (3.1 g; 20 mmol) was equilibrated between ethyl acetate and 10% sodium carbonate. The organic layer was filtered
20 and evaporated *in vacuo* to 2.25 g (~20 mmol) of 5-amino-3-methylisothiazole. It was pulverized and added to 100 mL 48% hydrobromic acid. 1.5 g (22 mmol) sodium nitrite was dissolved in 5 mL water and added to the starting material solution at room temperature. When the resultant exotherm was complete, 5.8 g (40 mmol) of pulverized cuprous bromide was added with stirring and left at room
25 temperature ~5 hours. The mixture was flooded with 200 mL water, then extracted with 1:1 ether/pentane. The organic layer was filtered and evaporated *in vacuo* to ~2 g of a yellow gum. Thin layer chromatography (SiO₂ /ether/hexane) showed a small fast spot and a large, slightly slower spot. Dissolution in pentane with a minimum volume of ether, followed by an extractive wash with conc. hydrochloric
30 acid removed all of the faster spot. Subsequent neutralization of the latter with 10% ammonium hydroxide and ether extraction, followed by evaporation of the extract, yielded 100 mg of Compound A with correct spectral data. The acid-washed ether/pentane layer was filtered and evaporated *in vacuo* to 1 g of the major spot, a

- 5 low-melting orange solid. It was confirmed to be Compound B by GCMS (m/e 257) and ¹H NMR (singlet at 2.6 ppm), in 39% recovered yield.

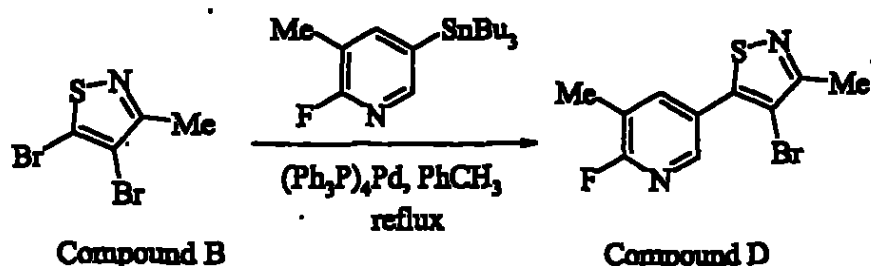
**Preparation of 3-chloro-2-fluoro-(3-methyl-5-isothiazolyl)pyridine
(Compound C)**



- 15 5-Bromo-3-methylisothiazole (400 mg; 2.2 mmol; 1.1 eq) (Compound A) was dissolved in toluene (5 mL) and tetrakis(triphenylphosphine)palladium(0) (116 mg; 0.1 mmol; 0.05 eq) was added. This mixture was blanketed with nitrogen and heated to 90 °C for the addition of a solution of 3-chloro-2-fluoro-5-(tributylstannyl)pyridine (838 mg; 2.0 mmol; 1 eq) in toluene (2 mL). This mixture was then heated to reflux overnight. It was cooled to RT, diluted with ether and filtered through Celite to give an orange solution which became a yellow-orange solid when the solvent was removed. GCMS showed 2 major products corresponding to the desired Compound C (m/e 228).

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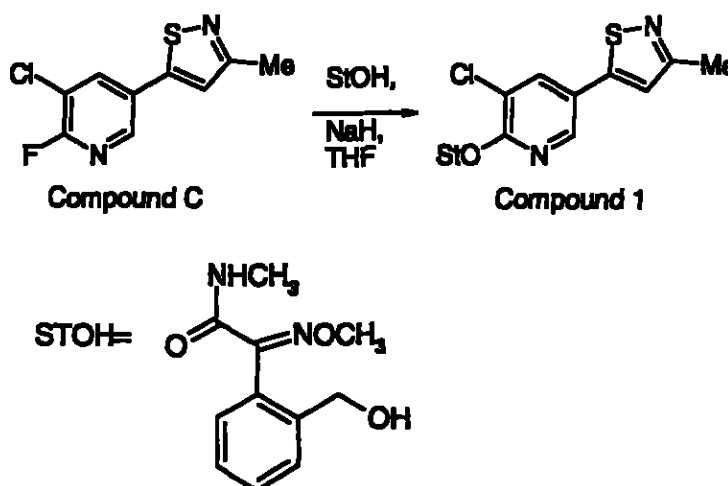
**Preparation of 2-fluoro-3-methyl-(4-bromo-3-methyl-5-isothiazolyl)pyridine
(Compound D)**



- 25 4,5-Dibromo-3-methylisothiazole (950 mg; 4 mmol) (Compound B) was dissolved in toluene (75 mL) and tetrakis(triphenylphosphine)palladium(0) (240 mg; 0.2

5 mmol) was added. This mixture was blanketed with nitrogen and heated to 90°C for the addition of a solution of 2-fluoro-3-methyl-5-(tributylstannyl)pyridine (1.6 g; 4.0 mmol; 1 eq) in toluene (2 mL). This mixture was then heated to reflux 2.5 hrs. Thin layer chromatography (hexane/ether) showed no Compound B, and the presence of a large mid-R_f product spot. The suspension was filtered and the filtrate stored cold
 10 overnight. After evaporating *in vacuo* to a dark oil it was eluted on a silica column with 1:1 pentane/ether to collect .8 g of the major, desired product as a clear oil. GCMS m/e=286/288 (confirming), 70% yield.

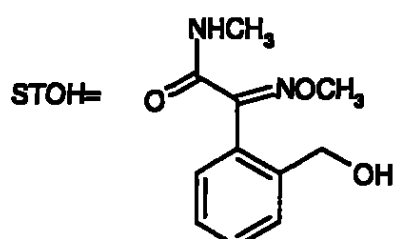
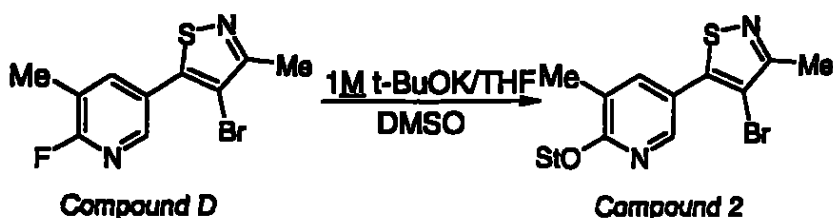
Preparation of 2-[[[3-chloro-5-[5-[3-methylisothiazolyl]]-2-pyridinyl]-oxy]methyl]-alpha-(methoxylimino)-N-methylbenzeneacetamide (Compound 1).
 15



StOH (0.33 g, 0.0015 mol) was dissolved with stirring in dry THF (10 mL) and 60% sodium hydride (0.07 g, 0.0018 mol) added. The mixture was stirred at room
 20 temperature for 30 minutes and a solution of compound C (0.29 g, 0.0014 mol) in dry THF (5 mL) added. The mixture was heated with stirring at 50 °C for 5 hours, cooled, and poured into water. The mixture was extracted with ethyl acetate (40 mL) and the organic extracts washed with water (40 mL) and brine (40 mL), and dried over anhydrous sodium sulphate. Evaporation of the solvent under reduced
 25 pressure and purification of the residue by chromatography over silica (10 - 50% ethyl acetate/hexanes) gave the desired product.

5

Preparation of 2-[[[3-methyl-5-[5-[4-bromo-3-methylisothiazolyl]]-2-pyridinyl]-oxy]methyl]-alpha-(methoxyimino)-N-methylbenzenesacetamide (Compound 2).



Compound D (.72 g, 2.5mmol) was dissolved in 50 mL anh. DMSO. To this was added .56 g (2.5 mmol) of the methoximinoamide referred to as StOH, with stirring and nitrogen purging. Upon injection of 3 mL (3 mmol) of 1M t-BuOK/THF the solution turned deep red. After stirring 20 min. thin layer chromatography of an acidified aliquot showed no Compound D, and a large low-mid-Rf product spot. Removed most of the DMSO *in vacuo*, flooded with 100 mL dilute hydrochloric acid (pH 4-5), and extracted twice with ethyl acetate. Filtered and evaporated extract *in vacuo* to 1.1 g orange gum. Eluted on silica column with 5:2 ether/pentane to collect .75 g of the major product as a clear oil which became a hard white foam on extended high vacuum, mp=48-53°C. GCMS m/e=490 (confirming).

20

BIOLOGICAL RESULTS

Pathogen propagation and host inoculation. Plants were inoculated with various pathogens 1-4 days before compound application (curative tests) and 1-7 days after compound application (protectant tests). For all wheat trials, compounds were applied at growth stage 1.2, when the second leaf was expanded to about 1/2 of its final size (12 days after seeds were first watered). Information on the growth stages

- 5 of other plant species at the time compound application and on the propagation and inoculation procedures associated with each pathogen is given below.

ERYSGT: Wheat seedlings were infected with fresh spores from the obligate pathogen ERYSGT by shaking heavily infected wheat plants over them. Plants that
10 had been dusted with ERYSGT spores were incubated in the greenhouse at 22°C until disease symptoms had fully developed (usually 7 days).

PUCCRT: Spores of the obligate pathogen PUCCRT were collected from infected plants with a vacuum apparatus and stored at 4°C. Approximately 0.1 g of fresh
15 spores (stored at 4°C for less than 30 days) was mixed with several drops of Tween 20. The thick spore paste was diluted to 100 ml with water and sprayed to run-off on wheat seed seedlings. Plants inoculated with PUCCRT were kept in a 20°C dew chamber overnight and then transferred to a 20°C growth chamber where symptoms developed in 8-9 days.

20

SEPTTR: Fresh inoculum is prepared in a manner similar to that described for LEPTNO. In this case, a brownish layer of spores covers the entire surface of the PDA plate and only a few plates are needed to obtain a large number of spores. After incubation overnight in the 20°C dew chamber, inoculated plants were
25 continually misted for 3 days in a 20°C greenhouse, then grown at 20°C without mist until disease symptoms had fully developed (usually about 10 days).

LEPTNO: Fresh inoculum was prepared by streaking PDA plates with spore exudates from an older plate using a sterile spatula. The plates were incubated at
30 18°C under black lights and typically produced large quantities of spores in pink exudate in 6-7 days. A small amount of tap water was poured onto several plates and spores were collected by scraping the exudates off the PDA surface into the water. The spore solutions were combined in a large beaker, diluted with 200-300 ml of water and filtered through a 180u mesh screen. The spore concentration was

5 determined using a hemacytometer and water was added to obtain a final
concentration of 10^7 spores/ml. Approximately 3 large drops of Tween 20 were
added for each 100 ml of volume and the spore solution was sprayed to run-off on
wheat seedlings. Inoculated plants were placed in a 20°C dew chamber overnight,
then moved to a 20°C greenhouse where they were continually misted (12 seconds
10 of mist every minute) until disease symptoms were fully developed (8-10 days).

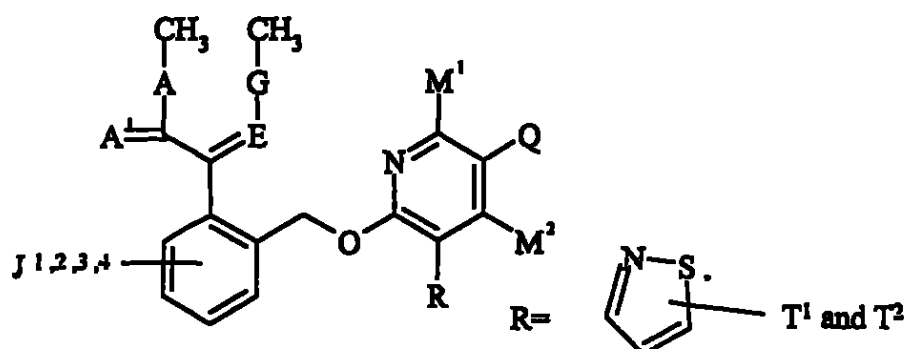
60,626

5 TABLE ONE "Biological Data for Compounds 1-2

Compound	Rate (g al/hr)	ERYSGT		LEPTNO		PUC CRT		SEPTTR	
		3DC	7DP	3DC	7DP	3DC	7DP	3DC	7DP
1	125		100	71	88	100	100		99
	62.5		88	53	85	100	100		85
	31.3		45	60	50	99	94		59
	15.5		51	58	48	83	80		22
2	125	failed	failed	67	88	83	100		97
	62.5			47	84	83	100		96
	31.3			73	79	63	100		85
	15.5			65	85	50	100		85

5 **WE CLAIM:**

1. A compound according to formula one



Formula One

A is selected from the group consisting of oxy (-O-) and amino (-NH-);

- 10 A¹ is selected from the group consisting of oxo (O=) and thioxo (S=);

E is selected from the group consisting of aza (-N=) and methine (-CH=);

- 15 J¹, J², J³, and J⁴ are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁-₄ alkyl, C₁-₄ alkoxy, C₁-₄ alkyl (mono or multi- halo), and C₁-₄ alkylthio;

- M¹, and M² are selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁-₆ alkyl, C₁-₆ alkoxy, C₁-₄ alkyl (mono or multi- halo), and C₁-₄ alkylthio, nitro (-NO₂), (mono or multi- halo) C₁-₄ alkoxy, aryl (-Aryl), substituted aryl (-SAryl), heteroaryl (-HAryl), and substituted heteroaryl (-SHAryl), where "aryl" or "Ph" refers to a phenyl group and where "heteroaryl" refers to pyridyl, pyridinyl, pyrazinyl or pyridazinyl, and where said SAryl and SHAryl have substituents that are independently selected from the group consisting C₁-C₆ alkyl, C₁-C₆ alkoxy, halo-C₁-C₆ alkyl, halo-C₁-C₆ alkoxy, halo, nitro, carbo-C₁-C₆ alkoxy, or cyano, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino, preferably, hydro (-H), C₁-C₆ alkyls,

- 5 arylalkyl, alkanoyl, benzoyl, amino, and substituted amino where said substituted amino has substituents that are independently selected from the group consisting of hydro (-H), alkyl, arylalkyl, alkanoyl, benzoyl, and amino;
- 10 Q is selected from the group consisting of hydro, halo, cyano, (mono or multi halo) C₁₋₆ alkyl, and C₁₋₆ alkyl; and
- 15 T¹ and T² are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁₋₆ alkyl, C₁₋₆ alkoxy, C₁₋₄ alkyl (mono or multi- halo), and C₁₋₄ alkylthio, nitro (-NO₂), (mono or multi- halo) C₁₋₄ alkoxy, aryl (-Aryl), substituted aryl (-SAryl), heteroaryl (-HAryl), and substituted heteroaryl (-SHAryl), where "aryl" or "Ph" refers to a phenyl group and where "heteroaryl" refers to pyridyl, pyridinyl, pyrazinyl or pyridazinyl, and where said SAryl and SHAryl have substituents that are
- 20 independently selected from the group consisting C_{1-C₆} alkyl, C_{1-C₆} alkoxy, halo-C_{1-C₆} alkyl, halo-C_{1-C₆} alkoxy, halo, nitro, carbo-C_{1-C₆} alkoxy, or cyano, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino, preferably, hydro (-H), C_{1-C₆} alkyls, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino where said substituted amino has substituents that are
- 25 independently selected from the group consisting of hydro (-H), alkyl, arylalkyl, alkanoyl, benzoyl, and amino. C₁₋₄ alkyl or one of the single bonds can be the connecting bond to the pyridyl.
2. A compound according to claim 1 wherein A is amino (-NH-).
- 30 3. A compound according to claim 1 wherein A¹ is oxo (O=).
4. A compound according to claim 1 wherein E is aza (-N=).

- 5 5. A compound according to claim 1 wherein J¹, J², J³, and J⁴ are hydro (-H).
6. A compound according to claim 1 wherein M¹, and M² are hydro (-H).
7. A compound according to claim 1 wherein Q is halo.
- 10 8. A compound according to claim 1 wherein T¹ and T² are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), and C₁₋₆ alkyl.
- 15 9. A compound according to claim 1 wherein A is amino (-NH-); A¹ is oxo (O=); E is aza (-N=); J¹, J², J³, and J⁴ are hydro (-H); M¹, and M² are hydro (-H); Q is halo; and T¹ and T² are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), and C₁₋₆ alkyl.
- 20 10. A process comprising applying fungicidal amount of a compound according to claim 1 to control or prevent a fungal attack in a locus.
11. A process comprising applying fungicidal amount of a compound according to claim 2 to control or prevent a fungal attack in a locus.
- 25 12. A process comprising applying fungicidal amount of a compound according to claim 3 to control or prevent a fungal attack in a locus.
13. A process comprising applying fungicidal amount of a compound according to claim 4 to control or prevent a fungal attack in a locus.
- 30 14. A process comprising applying fungicidal amount of a compound according to claim 5 to control or prevent a fungal attack in a locus.

- 5 15. A process comprising applying fungicidal amount of a compound according
to claim 6 to control or prevent a fungal attack in a locus.
16. A process comprising applying fungicidal amount of a compound according
to claim 7 to control or prevent a fungal attack in a locus.
- 10 17. A process comprising applying fungicidal amount of a compound according
to claim 8 to control or prevent a fungal attack in a locus.
18. A process comprising applying fungicidal amount of a compound according
15 to claim 9 to control or prevent a fungal attack in a locus.

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C07D417/04 A01N43/80

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 00 15637 A (DOW AGROSCIENCES LLC) 23 March 2000 (2000-03-23) example 32 claim 14	1-18
Y	EP 0 517 301 A (SCHERING AGROCHEMICALS LTD) 9 December 1992 (1992-12-09) examples 257,260,270,300 claims 4,5	1-18
Y	EP 0 468 695 A (ICI PLC) 29 January 1992 (1992-01-29) examples 411,475-780 claims 10,11	1-18
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"G" document member of the same patent family

Date of the actual completion of the international search

7 February 2002

Date of mailing of the international search report

19/02/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentkan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-3040, Tx. 31 651 apo nl,
Fax: (+31-70) 340-3016

Authorized officer

Seitner, I

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/29351

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 669 315 A (BASF AG) 30 August 1995 (1995-08-30) example 79 claim 11	1,10
A	EP 0 528 681 A (SHIONOGI & CO) 24 February 1993 (1993-02-24) example 19 claims 12-14	1,10

INTERNATIONAL SEARCH REPORT

26

Information on patent family members

International Application No

PCT/US 01/29351

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0015637	A	23-03-2000	AU 6251699 A BR 9915968 A EP 1114045 A1 WO 0015637 A1 US 6133294 A	03-04-2000 28-08-2001 11-07-2001 23-03-2000 17-10-2000
EP 0517301	A	09-12-1992	AP 347 A AT 121078 T AU 658894 B2 AU 1872292 A BR 9206069 A CA 2103463 A1 CN 1069852 A CZ 9302589 A3 DE 69202059 D1 DE 69202059 T2 DK 606228 T3 WO 9221653 A1 EP 0517301 A1 EP 0606228 A1 FI 935293 A HU 66206 A2 IE 921790 A1 JP 6507623 T MX 9202651 A1 ZA 9204070 A NZ 243020 A	29-07-1994 15-04-1995 04-05-1995 08-01-1993 27-12-1994 06-12-1992 17-03-1993 17-08-1994 18-05-1995 02-11-1995 04-09-1995 10-12-1992 09-12-1992 20-07-1994 29-11-1993 28-10-1994 16-12-1992 01-09-1994 01-10-1993 31-03-1993 25-02-1994
EP 0468695	A	29-01-1992	AT 142626 T AU 632425 B2 AU 8043791 A BR 9103225 A CA 2047510 A1 CN 1060289 A , B DE 69121996 D1 DE 69121996 T2 DK 468695 T3 EG 19683 A EP 0468695 A1 HU 212117 B IE 912418 A1 IL 98830 A JP 3041315 B2 JP 5163249 A KR 200936 B1 NZ 238928 A PT 98463 A , B ZA 9105512 A	15-09-1996 24-12-1992 30-01-1992 26-05-1992 28-01-1992 15-04-1992 17-10-1996 06-02-1997 17-02-1997 30-09-1995 29-01-1992 28-02-1996 29-01-1992 31-01-1996 15-05-2000 29-06-1993 15-06-1999 26-08-1992 29-05-1992 29-04-1992
EP 0669315	A	30-08-1995	DE 4030038 A1 AT 130598 T AT 156478 T AU 637527 B2 AU 8465691 A CA 2049162 A1 CS 9102872 A3 DE 59106935 D1 DE 59108820 D1	26-03-1992 15-12-1995 15-08-1997 27-05-1993 26-03-1992 23-03-1992 15-04-1992 04-01-1996 11-09-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/US 01/29351

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0669315	A	DK 669315 T3	15-09-1997
		EP 0477631 A1	01-04-1992
		EP 0669315 A1	30-08-1995
		ES 2106593 T3	01-11-1997
		GR 3024520 T3	28-11-1997
		HU 211029 B	28-09-1995
		IL 99113 A	27-11-1995
		JP 4288045 A	13-10-1992
		KR 188986 B1	01-06-1999
		NZ 239853 A	25-11-1993
		SK 280714 B6	12-06-2000
		US 5395854 A	07-03-1995
		US 5516804 A	14-05-1996
		US 5523454 A	04-06-1996
		US 5677347 A	14-10-1997
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		JP 3188286 B2	16-07-2001
		JP 5043533 A	23-02-1993
		AU 647654 B2	24-03-1994
		AU 2111892 A	25-02-1993
		CA 2075565 A1	21-02-1993
		DE 69207114 D1	08-02-1996
		DE 69207114 T2	22-08-1996
		DK 528681 T3	29-01-1996
		EP 0528681 A1	24-02-1993
		KR 221978 B1	15-09-1999
		US 5360810 A	01-11-1994
		US 5248687 A	28-09-1993

IPEA/US

CHAPTER II

PCT
DEMAND

under Article 31 of the Patent Cooperation Treaty.

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference 60,626A
International application No. PCT/US01/29351	International filing date 19 September 2001 19.09.01	(Earliest) Priority date 19 September 2000 19.09.00
Title of invention COMPOUNDS HAVING FUNGICIDAL ACTIVITY AND PROCESSES TO MAKE AND USE SAME		
Box No. II APPLICANT(S)		
Name and address: Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, Indiana 46268 United States of America		Telephone No. (317) 337-5115 Facsimile No. (317) 337-4847 Teleprinter No. Applicant's Registration No. with the Office 34,568
State (that is, country) of nationality: US		State (that is, country) of residence: US
Name and address: CETUSIC, Jeannie Rachel Phillips 10134 Cornith Way Avon, Indiana 46123 UNITED STATES OF AMERICA		
State (that is, country) of nationality: UNITED STATES OF AMERICA		State (that is, country) of residence: UNITED STATES OF AMERICA
Name and address: RIEDER, Brent Jeffrey 3756 Forest Lane Greenfield, Indiana 46140 UNITED STATES OF AMERICA		
State (that is, country) of nationality: UNITED STATES OF AMERICA		State (that is, country) of residence: UNITED STATES OF AMERICA
☐ Further applicants are indicated on a continuation sheet.		

International application No. PCT/US01/29351	
Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The following person is ☒ agent ☐ common representative and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination. ☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked. ☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.	
Name and address: CORVIN, Carl Dean Dow AgroSciences LLC 9330 Zionsville Road Indianapolis, Indiana 46268 United States of America	Telephone No. (317) 337-5115 Facsimile No. (317) 337-4847 Teleprinter No. Agent's Registration No. with the Office 34,569
☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	
Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION	
Statement concerning amendments:* 1. The applicant wishes the international preliminary examination to start on the basis of: ☒ the international application as originally filed the description ☒ as originally filed ☐ as amended under Article 34 the claims ☒ as originally filed ☐ as amended under Article 19 (together with any accompanying statement) ☐ as amended under Article 34 the drawings ☐ as originally filed ☐ as amended under Article 34 2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed. 3. ☒ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). (This check-box may be marked only where the time limit under Article 19 has not yet expired.) * Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.	
Language for the purposes of international preliminary examination: English ☒ which is the language in which the international application was filed. ☒ which is the language of a translation furnished for the purposes of international search. ☒ which is the language of publication of the international application. ☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.	
Box No. V ELECTION OF STATES	
The applicant hereby elects all eligible States (that is, all States which have been designated and which are bound by Chapter II of the PCT) excluding the following States which the applicant wishes not to elect:	

International application No.

PCT/US01/29351

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | |
|--|---|--------|
| 1. translation of international application | : | sheets |
| 2. amendments under Article 34 | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | sheets |
| 5. letter | : | sheets |
| 6. other (specify) | : | sheets |

For International Preliminary Examining Authority use only

received	not received
----------	--------------

- | | |
|--------------------------|--------------------------|
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|--|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listing in computer readable form |
| 3. ☐ original general power of attorney | 7. ☐ other (specify): |
| 4. ☐ copy of general power of attorney; reference number, if any: | |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Dow AgroSciences LLC

By: Carl D. Corvin
Carl D. Corvin

Signed on: April 17, 2002

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 80.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.☐ The applicant has been informed accordingly.4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

PATENT COOPERATION TREATY

RECEIVED
SEP 20 2002From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITYTo:
CARL D. CORVIN
DOW AGROSCIENCES LLC
9330 ZIONSVILLE ROAD
INDIANAPOLIS, IN 46268PCT
Response to
WRITTEN OPINION
Due 11/17/02
(PCT Rule 66)Date of Mailing
(day/month/year)

17 SEP 2002

Applicant's or agent's file reference

60,626A

REPLY DUE

within 2 months/days from
the above date of mailing

International application No.

PCT/US01/29351

International filing date (day/month/year)

19 September 2001 (19.09.2001)

Priority date (day/month/year)

19 September 2000 (19.09.2000)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): C07D 417/04; A61K 31/4436 and US Cl.: 546/271.1; 514/342

Applicant

DOW AGROSCIENCES LLC

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.3(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 19 January 2003 (19.01.2003).Name and mailing address of the IPEA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20531
Facsimile No. (703)305-3230

Authorized officer

Jane T. Fan

Telephone No. 703-308-1235

Form PCT/IPEA/408 (cover sheet)(July 1998)

ENTERED ON DOCKET/

REVIEWED

Date 10-1-02 By TH

WRITTEN OPINION

International application No.

PCT/US01/29351

I. Basis of the opinion

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages 1-17, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____
- ☒ the claims:
 pages 18-21, as originally filed
 pages NONE, as amended (together with any statement) under Article 19
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____
- ☒ the drawings:
 pages none, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages NONE, as originally filed
 pages NONE, filed with the demand
 pages NONE, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages none
- ☒ the claims, Nos. none
- ☒ the drawings, sheets/fig none

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

WRITTEN OPINION

International application No.
PCT/US01/29351

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-18</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-18 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the claimed compounds having 1,2-dioxoles as substituent on the pyridine ring.

WRITTEN OPINION

International application No.

PCT/US01/29351

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the questions whether the claims are fully supported by the description, are made:

Claim 1 is objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because claim 1 is indefinite for the following reason(s): G-CH3 should be O-CH3.

34

WRITTEN OPINION

International application No.
PCT/US01/29351

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

IN THE UNITED STATES RECEIVING OFFICE

Applicant (s): Dow AgroSciences LLC

International Application No.: PCT/US01/29351

Filed: 19 September 2001

For: COMPOUNDS HAVING FUNGICIDAL ACTIVITY AND PROCESSES TO MAKE
AND USE SAME

DAS REFERENCE: 60,626

Authorized Officer: Jane T. Fan

NOT VIA FACSIMILE TO EXAMINER DESK AT 10-10-10
EXHIBIT MAIL MAILING LABEL NO EV120180560US
DATE OF DEPOSIT: 25 September 2002

Dear Sir/Madam:

REPLY UNDER RULE 66.3 OF THE PCT

In response to the Written Opinion mailed 19 September 2002, the Applicants respectfully request the Examiner to enter this reply and the attached amendments into the record.

Please find attached hereto replacement pages 2 and 18. These pages identify and correct the typographical error pointed out by the Examiner in the Written Opinion.

The Applicant's Attorney may be reached at 317-337-5115 Monday through Friday from 7:30 - 4:30 Eastern Standard Time.

Respectfully submitted,



Carl D. Corvin
Registration No. 34,569
Phone: (317) 337-5115

September 25, 2002
9330 Zionsville Road
Indianapolis, Indiana 46268
CDC/ml

60,626A

ENTERED ON CORRESP.
INDEXED
25 SEP 2002

REPLACEMENT PAGE

5

SUMMARY OF THE INVENTION

It is an object of this invention to provide compounds that have fungicidal activity.

It is an object of this invention to provide processes that produce compounds that have fungicidal activity.

10 It is an object of this invention to provide processes that use compounds that have fungicidal activity.

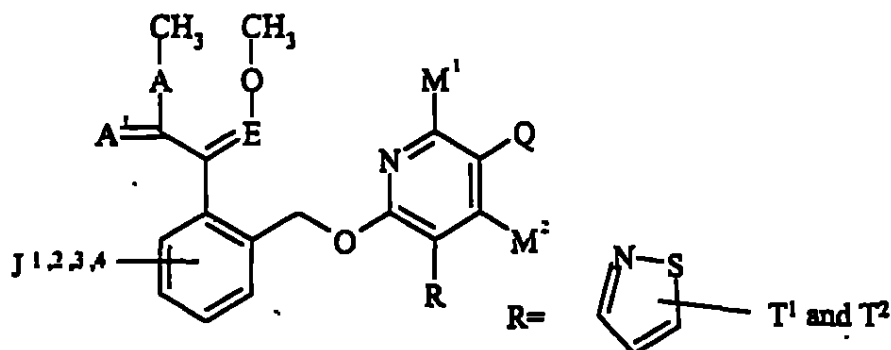
In accordance with this invention, processes to make and processes to use compounds having a general formula according to formula one, and said compounds
15 are provided.

While all the compounds of this invention have fungicidal activity, certain classes of compounds may be preferred for reasons such as, for example, greater efficacy or ease of synthesis.

20

DETAILED DESCRIPTION OF THE INVENTION

The compounds have a formula according to formula one. In formula one:



Formula One

A is selected from the group consisting of oxy (-O-) and amino (-NH-);

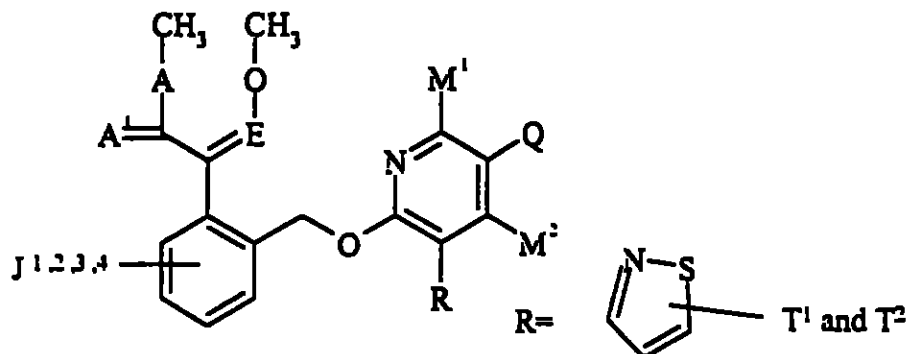
25 A¹ is selected from the group consisting of oxo (O=) and thioxo (S=);

E is selected from the group consisting of aza (-N=) and methine (-CH=);

REPLACEMENT PAGE

5 WE CLAIM:

1. A compound according to formula one



Formula One

A is selected from the group consisting of oxy (-O-) and amino (-NH-);

- 10 A¹ is selected from the group consisting of oxo (O=) and thioxo (S=);

E is selected from the group consisting of aza (-N=) and methine (-CH=);

- 15 J¹, J², J³, and J⁴ are independently selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁-₄ alkyl, C₁-₄ alkoxy, C₁-₄ alkyl (mono or multi- halo), and C₁-₄ alkylthio;

- 20 M¹, and M² are selected from the group consisting of hydro (-H), halo (-F, -Cl, -Br, and -I), C₁-₆ alkyl, C₁-₆ alkoxy, C₁-₄ alkyl (mono or multi- halo), and C₁-₄ alkylthio, nitro (-NO₂), (mono or multi- halo) C₁-₄ alkoxy, aryl (-Aryl), substituted aryl (-SAryl), heteroaryl (-HAryl), and substituted heteroaryl (-SHAryl), where "aryl" or "Ph" refers to a phenyl group and where "heteroaryl" refers to pyridyl, pyridinyl, pyrazinyl or pyridazinyl, and where said SAryl and SHAryl have substituents that are independently selected
- 25 from the group consisting C₁-C₆ alkyl, C₁-C₆ alkoxy, halo-C₁-C₆ alkyl, halo-C₁-C₆ alkoxy, halo, nitro, carbo-C₁-C₆ alkoxy, or cyano, arylalkyl, alkanoyl, benzoyl, amino, and substituted amino, preferably, hydro (-H), C₁-C₆ alkyls,

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For Receiving Office use only

International Application No.

International Filing Date

Name of Receiving Office and "PCT International Application"

Applicant's or agent's file reference

60,626A

Box No. I TITLE OF INVENTION

COMPOUNDS HAVING FUNGICIDAL ACTIVITY AND PROCESSES TO MAKE AND USE SAME

Box No. II APPLICANT

☐ This person is also inventor

Name and address:

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, Indiana 46268
UNITED STATES OF AMERICA

Telephone No.

(317) 337-5115

Facsimile No.

(317) 337-4847

Teleprinter No.

Applicant's Registration No. with the Office
34,569

State (that is, country) of nationality:

United States of America

State (that is, country) of residence:

United States of America

This person is applicant for the purposes of:

☐ all designated States☒ all designated States except the United States of America☐ the United States of America only☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address:

CETUSIC, Jeannie Rachel Phillips
10134 Cornith Way
Avon, Indiana 46123
United States of America

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's Registration No. with the Office

State (that is, country) of nationality:

United States of America

State (that is, country) of residence:

United States of America

This person is applicant for the purposes of:

☐ all designated States☐ all designated States except the United States of America☒ the United States of America only☐ the States indicated in the Supplemental Box☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent☐ common representative

Name and address:

CORVIN, Carl D
Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, Indiana 46268
UNITED STATES OF AMERICA

Telephone No.

(317) 337-5115

Facsimile No.

(317) 337-4847

Teleprinter No.

Agent's Registration No. with the Office
34,569☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
If none of the following sub-boxes is used, this sheet is not to be included in the request.	
Name and address: RIEDER, Brent Jeffrey 3756 Forest Lane Greenfield, Indiana 46140 United States of America	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.) Applicant's Registration No. with the Office
State (that is, country) of nationality: United States of America	State (that is, country) of residence: United States of America
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address:	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.) Applicant's Registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address:	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.) Applicant's Registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address:	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.) Applicant's Registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (If other kind of protection or treatment desired, specify on line) _____.

National Patent (If other kind of protection or treatment desired, specify on line):

- | | | |
|---|--|--|
| ☒ AE United Arab Emirates | ☒ GE Georgia | ☒ MW Malawi |
| ☒ AG Antigua and Barbuda | ☒ GH Ghana | ☒ MX Mexico |
| ☒ AL Albania | ☒ GM Gambia | ☒ MZ Mozambique |
| ☒ AM Armenia | ☒ HR Croatia | ☒ NO Norway |
| ☒ AT Austria | ☒ HU Hungary | ☒ NZ New Zealand |
| ☒ AU Australia | ☒ ID Indonesia | ☒ PL Poland |
| ☒ AZ Azerbaijan | ☒ IL Israel | ☒ PT Portugal |
| ☒ BA Bosnia and Herzegovina | ☒ IN India | ☒ RO Romania |
| ☒ BB Barbados | ☒ IS Iceland | ☒ RU Russian Federation |
| ☒ BG Bulgaria | ☒ JP Japan | ☐ SD Sudan |
| ☒ BR Brazil | ☒ KE Kenya | ☒ SE Sweden |
| ☒ BY Belarus | ☒ KG Kyrgyzstan | ☒ SG Singapore |
| ☒ BZ Belize | ☐ KP Democratic People's Republic of Korea | ☒ SI Slovenia |
| ☒ CA Canada | ☒ KR Republic of Korea | ☒ SK Slovakia |
| ☒ CH and LI Switzerland and Liechtenstein | ☒ KZ Kazakhstan | ☒ SL Sierra Leone |
| ☒ CN China | ☒ LC Saint Lucia | ☒ TJ Tajikistan |
| ☒ CO Colombia | ☒ LK Sri Lanka | ☒ TM Turkmenistan |
| ☒ CR Costa Rica | ☒ LR Liberia | ☒ TR Turkey |
| ☐ CU Cuba | ☒ LS Lesotho | ☒ TT Trinidad and Tobago |
| ☒ CZ Czech Republic | ☒ LT Lithuania | ☒ TZ United Republic of Tanzania |
| ☒ DE Germany | ☒ LU Luxembourg | ☒ UA Ukraine |
| ☒ DK Denmark | ☒ LV Latvia | ☒ UG Uganda |
| ☒ DM Dominica | ☒ MA Morocco | ☒ US United States of America |
| ☒ DZ Algeria | ☒ MD Republic of Moldova | ☒ UZ Uzbekistan |
| ☒ EE Estonia | ☒ MG Madagascar | ☒ VN Viet Nam |
| ☒ ES Spain | ☒ MK The former Yugoslav Republic of Macedonia | ☒ YU Yugoslavia |
| ☒ FI Finland | ☒ MN Mongolia | ☒ ZA South Africa |
| ☒ GB United Kingdom | | ☒ ZW Zimbabwe |
| ☒ GD Grenada | | |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

- | | | |
|--------------------------------|--------------------------------|--------------------------------|
| ☐ _____ | ☐ _____ | ☐ _____ |
| ☐ _____ | ☐ _____ | ☐ _____ |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that these additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

21

Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
Item (1) 19 September 2000 19.09.00	60/233,781	US		
Item (2)				
Item (3)				
Item (4)				
Item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items ☒ Item (1) ☐ Item (2) ☐ Item (3) ☐ Item (4) ☐ Item (5) ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)).

Box No. VII INTERNATIONAL SEARCHING AUTHORITY		
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		
ISA /EP		
Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):		
Date (day/month/year)	Number	Country (or regional Office)
_____	_____	

Box No. VIII DECLARATIONS		
The following declarations are contained in Boxes Nos. VIII(i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration)		Number of declarations
☐ Box No. VIII (i)	Declaration as to the identity of the inventor	:
☐ Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	:
☐ Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	:
☒ Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)	1
☐ Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	:

Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII(I) to (iv) (in general) and the specific Notes to Box No. VIII(iv). If this Box is not used, this sheet should not be included in the request.

**Declaration of Inventorship (Rules 4.17(iv) and 51 b/s.1(a)(iv))
for the purposes of the designation of the United States of America:**

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/_____ (if furnishing declaration pursuant to Rule 26ter).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications:

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 CFR § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

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.

Name: Jeannie Rachel Phillips Catuic

Residence: Avon, Indiana
(city and either U.S. state, if applicable, or country)

Mailing Address: 10134 Cornith Way

Citizenship: United States of America

Inventor's Signature: Jeannie Rachel Phillips Catuic
(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)
international application)

Date: 9/19/01

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

Name: Brent Jeffrey Rieder

Residence: Greenfield, Indiana
(city and either U.S. state, if applicable, or country)

Mailing Address: 3756 Forest Lane

Citizenship: United States of America

Inventor's Signature: Brent Jeffrey Rieder
(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)
international application)

Date: 9/19/01

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII(iv)."

Box No. IX CHECK LIST; LANGUAGE OF FILING

This international application contains: (a) the following number of sheets in paper form: request (including declaration sheets) : <u>6</u> description (excluding sequence listing part) : <u>17</u> claims : <u>4</u> abstract : <u>1</u> drawings : <u>0</u> Sub-total number of sheets: <u>28</u> sequence listing part of description (actual number of sheets if filed in paper form, whether or not also filed in computer readable form: see (b) below) : <u>0</u> Total number of sheets: : <u>28</u> (b) sequence listing part of description filed in computer readable form (i) ☐ only (under Section 801(a)(I)) (ii) ☐ in addition to being filed in paper form (under Section 801(a)(II)) Type and number of carriers (diskette, CD-ROM, CD-R or other) on which the sequence listing part is contained (additional copies to be indicated under item 9(II), in right column): —		This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item): 1. ☒ fee calculation sheet : <u>1</u> 2. ☐ original separate power of attorney : 3. ☐ original general power of attorney : 4. ☒ copy of general power of attorney; reference number, if any : <u>1</u> 5. ☐ statement explaining lack of signature : 6. ☐ priority document(s) identified in Box No. VI as item(s): : 7. ☐ translation of international application into (language): : 8. ☐ separate indications concerning deposited microorganism or other biological material : 9. ☐ sequence listing in computer readable form (Indicate also type and number of carriers (diskette, CD-ROM, CD-R or other)) (i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application) : (ii) ☐ (only where check-box (b)(i) or (b)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter : (iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing part mentioned in left column : 10. ☒ other (specify): Cover Letter to USRO; return postcard : <u>2</u>	
--	--	---	--

Figure of the drawings which should accompany the abstract:

Language of filing of the international application:

English

Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Dow AgroSciences LLC

By: 

Carl D. Corvin

1. Date of actual receipt of the purported international application:		2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): <u>ISA/</u>	6. ☐ Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy by the International Bureau:

For International Bureau use only

44

**DERIVADOS TIAZOL DE 2-METOXIIMINO-2-(PIRIDINILOXIMETIL) -
FENIL-ACETAMIDAS ÚTILES COMO FUNGICIDAS**

PRIORIDAD

5 La presente solicitud reclama la prioridad de la Solicitud de
Patente Norteamericana Provisional 60/233,781 la cual fue
presentada el 19 de Septiembre del 2001.

Campo de la Invención

10 La presente invención se refiere al campo de compuestos que
tienen actividad fungicida y procesos para hacer y utilizar dichos
compuestos.

Antecedentes de la Invención

15 Nuestra historia está plagada de epidemias de enfermedades
fungales que han causado el sufrimiento difundido de los humanos.
Para ver los efectos de una enfermedad fungal, se necesita ver nada
menos que la carestía de la papa irlandesa de los años 1850, en
donde perecieron un estimado de 1,000,000 de personas..

20 Los fungicidas son compuestos, de origen natural o sintético
los cuales actúan para proteger a las plantas contra el daño causado
por los hongos. Los métodos actuales de agricultura dependen
ampliamente del uso de fungicidas. En efecto, algunas cosechas no
pueden ser cultivadas de manera útil sin el uso de fungicidas.

25 El uso de los fungicidas permite que un agricultor aumente el
rendimiento de sus cosechas y por consiguiente, aumente el valor de
la cosecha. En la mayoría de las situaciones, el aumento en el valor

de las cosechas es equivalente a por lo menos tres veces el costo del uso del fungicida. Sin embargo, ningún fungicida es útil en todas las situaciones.

Por consiguiente, se están realizando investigaciones para producir fungicidas que sean más seguros, y que tengan un mejor funcionamiento, que sean más fáciles de usar y que tengan un costo menor. A la luz de lo anterior, los Inventores proporcionan la presente Invención.

Sumario de la Invención

10 Es un objeto de la presente Invención proporcionar compuestos que tienen actividad fungicida.

Es un objeto de la presente Invención proporcionar procesos que producen compuestos que tienen una actividad fungicida.

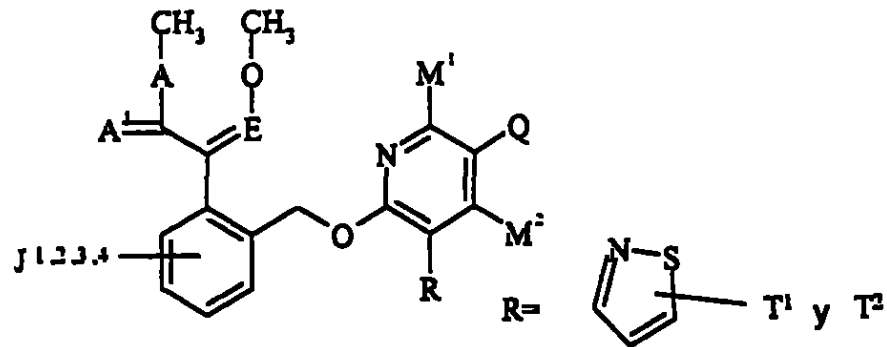
Otro objeto de la presente Invención es proporcionar procesos que utilizan compuestos que tienen actividad fungicida.

De acuerdo con la presente invención, se proporcionan procesos para elaborar y procesos para usar los compuestos que tienen una fórmula general de acuerdo con la fórmula uno, y dichos compuestos.

20 Aunque todos los compuestos de la presente Invención tienen actividad fungicida, ciertas clases de compuestos pueden ser preferidos por razones, tales como por ejemplo, una eficiencia mayor o facilidad en la síntesis.

Descripción Detallada de la Invención**№4577**

Los compuestos tienen una fórmula de acuerdo con la fórmula uno. En la fórmula uno:

**Fórmula uno**

A es seleccionado del grupo consistente de oxo (-O-) y amino (-NH-);

A¹ es seleccionado del grupo consistente de oxo (O=) y tioxo (S=);

15 E es seleccionado del grupo consistente de aza (-N=) y metina (-CH=);

J¹, J², J³, y J⁴ son seleccionados independientemente del grupo consiste de hidrógeno (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁-₄, alcoxi C₁-₄, alquilo C₁-₄ (mono o multi- halo), y alquiltio C₁-₄;

20 M¹, y M² son seleccionados del grupo consistente de hidrógeno (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁-₄, alcoxi C₁-₄, alquilo C₁-₄ (mono o multi- halo), y alquiltio C₁-₄, nitro (-NO₂), (mono o multi- halo) alcoxi C₁-₄, arilo (-Arilo), arilo sustituido (-SArilo), heteroarilo (-HArilo), y heteroarilo sustituido (-SHArilo), en donde "arilo" o "F" se refiere a un grupo fenilo y en donde "heteroarilo" se refiere a piridilo,

25

piridinilo, pirazinilo o piridazinilo, en donde dicho Sarilo y SHArilo tienen sustituyentes que son seleccionados independientemente del grupo consistente de alquilo C₁-C₆, alcoxi C₁-C₆, halo-C₁-C₆ alquilo, halo-C₁-C₆ alcoxi, halo, nitro, alcoxi carbo-C₁-C₆, o ciano, arilalquilo, alcanollo, benzollo, amino, y amino sustituido, de preferencia, hidro (-H), alquilo C₁-C₆, arilalquilo, alcanollo, benzollo, amino, y amino sustituido, en donde dicho amino sustituido tiene los sustituyentes que son seleccionados independientemente del grupo consistente de hidro (-H) alquilo, arilalquilo, alcanollo, benzollo, y amino;

Q es seleccionado del grupo consistente de hidro, halo, ciano, (mono o multi halo) alquilo C₁₋₆, y alquilo C₁₋₆; y

T¹ y T² son seleccionados independientemente del grupo consistente de hidro (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁₋₆, alcoxi C₁₋₆, alquilo C₁₋₄ (mono o multi- halo), y alquilo C₁₋₄, nitro (-NO₂), (mono o multi- halo) alcoxi C₁₋₄, arilo (-Arilo), arilo sustituido (-SArilo), heteroarilo (-HArilo), y heteroarilo sustituido (-SHArilo), en donde "arilo" o "F" se refiere a un grupo fenilo y en donde "heteroarilo" se refiere a piridilo, piridinilo, pirazinilo, o piridazinilo, y en donde dicho SArilo y SHArilo tienen sustituyentes que son seleccionados independientemente del grupo consistente de alquilo C₁-C₆, alcoxi C₁-C₆, alquilo halo-C₁-C₆, alcoxi halo-C₁-C₆, halo, nitro, alcoxi carbo-C₁-C₆, o ciano, arilalquilo, alcanollo, benzollo, amino, y amino sustituido de preferencia, hidro (-H), alquilo C₁-C₆, arilalquilo, alcanollo, benzollo, amino, y amino sustituido, en donde

dicho amino sustituido tiene substituyentes que son seleccionados independientemente del grupo consistente de hidro (-H), alquilo, arilalquilo, alcanilo, benzoilo, y alquil amino-C₁₋₄ o uno de los enlaces sencillos que pueden ser los enlaces de conexión al piridilo.

5 Los términos "alquilo", "alquenilo", o "alquínilo" se refieren a un grupo de carbono de cadena ramificada o no ramificada. El término "alcoxi" se refiere a un grupo alcoxi de cadena ramificada o no ramificada. El término "haloalquilo" se refiere a un grupo alquilo ramificado o no ramificado substituido por uno o más átomos halo. El
10 término "haloalcoxi" se refiere a un grupo alcoxi substituido por uno o más átomos halo. En todo este documento, todas las temperaturas se proporcionan en grados Celsius, y todos los porcentajes son porcentajes en peso, a menos que se indique lo contrario. El término "Me" se refiere a un grupo metilo. El término "Et" se refiere a un
15 grupo etilo. El término "Pr" se refiere a un grupo propilo. El término "Bu" se refiere a un grupo butilo. El término "EtOAc" se refiere a acetato de etilo. El término "DMSO" se refiere a dimetilsulfóxido. El término "Éter", cuando es usado en el cuerpo del texto bajo el título de "Preparación", se refiere a éter dietílico. El término "ppm" se
20 refiere a partes por millón. El término, "psi" se refiere a libras por pulgadas cuadradas.

En general, estos compuestos pueden ser utilizados de una variedad de modos. Estos compuestos son aplicados preferentemente en la forma de una formulación que comprende uno
25 o más de los compuestos con un vehículo fitológicamente aceptable.

Las formulaciones concentradas pueden ser dispersadas en agua, u otro líquido para su aplicación, o las formulaciones pueden ser similares al polvo, o granulares, las cuales pueden ser aplicadas entonces sin tratamiento adicional. Las formulaciones son
5 preparadas de acuerdo con los procedimientos que son convencionales en la técnica de la química agrícola, pero los cuales son nuevos e importantes, debido a la presencia de uno o más de los compuestos en los mismos.

Las formulaciones que son aplicadas con mayor frecuencia,
10 son suspensiones o emulsiones acuosas. Cualquiera de dichas formulaciones solubles en agua, que se pueden suspender en agua o que se pueden emulsificar, son sólidas, generalmente conocidas como polvos que se pueden humedecer, o líquidos, generalmente conocidos como concentrados emulsificables, suspensiones acuosas,
15 o concentrados de suspensión. La presente invención contempla todos los vehículos, por medio de los cuales uno o más de los compuestos pueden ser formulados para su administración y uso como fungicidas.

Como se podrá apreciar fácilmente, pueden ser utilizado
20 cualquier material al cual pueden ser agregados estos compuestos, siempre que ellos produzcan la utilidad deseada, sin una interferencia importante con la actividad de estos compuestos como agentes antifungales.

Los polvos que se pueden humedecer, los cuales pueden ser
25 compactados para formar gránulos que se pueden dispersar en agua,

comprenden una mezcla íntima de uno o más de los compuestos, un vehículo inerte y tensioactivos. La concentración de los compuestos en el polvo que se puede humedecer, generalmente es de aproximadamente el 10% a aproximadamente el 90% p/p, más preferentemente de aproximadamente el 25% hasta aproximadamente el 75% p/p. En la preparación de las formulaciones de polvo que se puede humedecer, los compuestos pueden comprender cualquiera de los sólidos finamente divididos, tales como profillita, talco, gis, yeso, tierra de Fuller, bentonita, atapulgita, almidón, caseína, gluten, arcillas de montmorillonita, tierras diatomáceas, silicatos purificados o similares. En dichas operaciones, el vehículo finamente dividido es molido o mezclado con los compuestos en un solvente orgánico volátil. Los tensioactivos efectivos que comprenden desde aproximadamente el 0.5% hasta aproximadamente el 10% del polvo que se puede humedecer, e incluyen ligninas sulfonadas, naftalenosulfonatos, alquilbencenosulfonatos, sulfatos alquilo, y tensioactivos no iónicos, tales como aductos de óxido de etileno de fenoles alquilo.

Los concentrados que se pueden emulsificar de los compuestos, comprenden una concentración conveniente, tal como desde aproximadamente el 10% a aproximadamente el 50% p/p, en un líquido adecuado. Los compuestos son disueltos en el vehículo inerte, el cual es, ya sea un solvente miscible en agua o una mezcla de solventes orgánicos que no se mezclan en agua, y emulsificadores. Los concentrados pueden ser diluidos con agua y

aceite para formar mezcla de rociado en la forma de emulsiones de aceite en agua. Los solventes orgánicos útiles incluyen aromáticos, especialmente las porciones naftalénica y olefínica de alta ebullición del petróleo, tales como nafta aromática pesada. También se pueden
5 utilizar otros solventes orgánicos, tales por ejemplo, solventes terpénicos, incluyendo derivados de rosina, cetonas alifáticas tales como ciclohexanona, y alcoholes complejos, tales como 2-etoxietanol.

Los emulsificadores que pueden ser empleados de manera
10 provechosa en la presente invención pueden ser determinados fácilmente por aquellos expertos en la técnica e incluyen varios emulsificadores no iónicos, aniónicos, catiónicos, y anfotéricos, o una mezcla de dos o más emulsificadores. Los ejemplos de los emulsificadores no iónicos útiles para preparar los concentrados que
15 se pueden emulsificar incluyen los éteres de polialquilenglicol, y los productos de condensación de fenoles alquilo y arilo, alcoholes alifáticos, aminas alifáticas o ácidos grasos con óxido de etileno, óxidos de propileno, tales como fenoles alquilo etoxilados y ésteres carboxílicos solubilizados con poliol o polioxilalquileno. Los
20 emulsificadores catiónicos incluyen compuestos de amonio cuaternario y sales de amina grasa. Los emulsificadores aniónicos incluyen sales solubles en aceite, (por ejemplo, calcio) de ácidos alquilaril sulfónico, sales solubles en aceite o éteres de poliglicol sulfatados y las sales apropiadas del éter de poliglicol fosfatado.

Los líquidos orgánicos representativos que pueden ser empleados para preparar los concentrados que se pueden emulsificar de la presente invención, son líquidos aromáticos, tales como xileno, fracciones de propil benceno; o fracciones de naftaleno mezcladas, aceites minerales, líquidos orgánicos aromáticos substituidos, tales como dioctil ftalato; queroseno; amidas dialquilo de diferentes ácidos grasos, particularmente las amidas dimetilo de los glicoles grasos, y los derivados de glicol, tales como los n-butil éter, etil éter o metil éter de dietilénglicol, y el metil éter de trietilénglicol. Las mezclas de dos o más líquidos orgánicos también son empleadas con frecuencia de manera conveniente en la preparación del concentrado que se puede emulsificar. Los líquidos orgánicos preferidos son xileno, y fracciones de propil benceno, siendo el xileno el más preferido. Los agentes de dispersión activos en superficies son generalmente empleados en formulaciones líquidas, y en una cantidad del 0.1 al 20 por ciento en peso del peso combinado del agente de dispersión con uno o más de los compuestos. Las formulaciones también pueden contener otros aditivos compatibles, por ejemplo, reguladores de crecimiento de plantas, y otros compuestos activos biológicamente utilizados en la agricultura.

Las suspensiones acuosas comprenden suspensiones de uno o más compuestos insolubles en agua, dispersados en un vehículo acuoso en una concentración en un rango de aproximadamente el 5% hasta aproximadamente el 50% p/p. Las suspensiones son preparadas moliendo finamente uno o más de los compuestos, y

mezclando vigorosamente el material molido dentro de un vehículo que comprende agua y los tensioactivos seleccionados de los mismos tipos que se explicaron anteriormente. También se pueden agregar otros ingredientes, tales como sales inorgánicas, y gomas
5 sintéticas o naturales para aumentar la densidad y viscosidad del vehículo acuoso. Con frecuencia, es más efectivo molerlos y mezclarlos al mismo tiempo preparando una mezcla acuosa y homogeneizarla en un implemento, tal como un molino de arena, un molino de bola, o un homogeneizador de tipo de émbolo.

10 Los compuestos pueden ser aplicados también como formulaciones granulares, las cuales son particularmente útiles para aplicaciones a la tierra. Las formulaciones granulares generalmente contienen desde aproximadamente el 0.5% hasta aproximadamente el 10% p/p de los compuestos, dispersados en un vehículo inerte el
15 cual consiste completamente o en gran parte de atapulgita, bentonita, diatomita, arcilla o una sustancia similar no costosa dividida de manera gruesa. Generalmente, dichas formulaciones son preparadas disolviendo el compuesto en un solvente adecuado y aplicándolo a un vehículo granular, el cual ha sido previamente
20 formado al tamaño de partícula apropiado, en un rango de aproximadamente 0.5 hasta aproximadamente 3 mm. Dichas formulaciones también pueden ser preparadas haciendo una dona o pasta del vehículo y el compuesto, moléndolo y secándolo para obtener la partícula granular deseada.

Los polvos que contienen el compuesto son preparados simplemente mezclando íntimamente uno o más de los compuestos en forma pulverizada con un vehículo agrícola en polvo adecuado, tal como por ejemplo, arcilla de caolina, roca volcánica molida y similares. Los polvos pueden contener adecuadamente desde aproximadamente el 1% hasta aproximadamente el 10% p/p de los compuestos.

Las formulaciones pueden contener tensioactivos adyuvantes para mejorar la deposición, humedecimiento, y penetración de los compuestos sobre la cosecha y organismos objetivo. Estos tensioactivos adyuvantes pueden ser empleados opcionalmente como un componente de la formulación o como una mezcla en el tanque. La cantidad del tensioactivo adyuvante variará del 0.01 por ciento al 1.0 por ciento v/v, basado en el volumen de agua-rocío, y de preferencia del 0.05 al 0.5%. Los tensioactivos adyuvantes adecuados incluyen fenoles nonilo etoxilados, alcoholes naturales o sintéticos etoxilados, sales de los ésteres o ácidos sulfosuccínicos, organosiliconas etoxiladas, aminas grasas etoxiladas y mezclas de tensioactivos con aceites minerales o vegetales.

Las formulaciones pueden incluir opcionalmente combinaciones que comprenden por lo menos el 1% de uno o más de los compuestos con otros compuestos pesticidas. Dichos compuestos pesticidas adicionales pueden ser fungicidas, insecticidas, nematocidas, miticidas, artropodicidas, bactericidas o combinaciones de los mismos que sean compatibles con los compuestos de la

presente invención en el medio seleccionado para la aplicación, y no antagónicos a la actividad de los compuestos de la presente invención. Por consiguiente, en dichas modalidades el otro compuesto pesticida es empleado como un tóxico suplementario para el mismo uso pesticida o para un uso diferente. Los compuestos y los compuestos pesticidas en combinación, generalmente pueden estar presentes en una proporción en peso de aproximadamente 1:100 a 100:1.

La presente invención incluye dentro de su alcance, métodos para el control o prevención del ataque fungal. Estos métodos comprenden la aplicación al lugar del hongo, o a un lugar en el cual se va a prevenir la infestación (por ejemplo aplicándolo a plantas de cereales o uvas), una cantidad fungicida de uno o más de los compuestos. Los compuestos son adecuados para el tratamiento de diferentes plantas en niveles fungicidas, mientras que exhiben una fitotoxicidad baja. Los compuestos son útiles en una modalidad de protección o erradicante. Los compuestos son aplicados por medio de cualquiera de una variedad de técnicas conocidas, ya sean los compuestos o las formulaciones que comprenden los compuestos. Por ejemplo, los compuestos pueden ser aplicados a las raíces, semillas o follaje del árbol de las plantas para el control de diferentes hongos, sin dañar el valor comercial de las plantas. Los materiales son aplicados en la forma de cualquiera de los tipos de formulación generalmente utilizados, por ejemplo, en la forma de soluciones, polvos, polvos que se pueden humedecer, concentrados

que pueden fluir o concentrados emulsificables. Estos materiales son aplicados de manera conveniente de varios modos conocidos.

Se ha descubierto que los compuestos tienen un efecto fungicida importante particularmente para uso agrícola. Muchos de los compuestos son particularmente efectivos para utilizarlos con cosechas agrícolas y plantas de horticultura, o con soportes de madera, pintura, piel o alfombras.

En particular, los compuestos controlan de manera efectiva una variedad de hongos indeseables que infectan las cosechas de plantas útiles. Se ha demostrado actividad para una variedad de hongos, incluyendo por ejemplo, las siguientes especies representativas de hongos:

- Mildíu Suave de la Uva (*Plasmopara viticola* – PLASVI);
- Añublo Tardío del Tomate (*Phytophthora Infestans* – PHYTIN);
- 15 Roya de la Manzana (*Venturia Inaequalis* – VENTIN);
- Roya Café del Trigo (*Puccinia recondita* – PUCCRT);
- Roya Rayada del Trigo (*Puccinia striiformis* – PUC CST);
- Añublo del Arroz (*Pyricularia oryzae* – PYRIOR);
- Mancha de Cercospora de la Hoja de Remolacha (*Cercospora*
- 20 *beticola* – CERCBE);
- Mildíu Polvoso del Trigo (*Erysiphe graminis* – ERYSGT);
- Mancha de la Hoja de Trigo (*Septoria tritici* – SEPTTR);
- Añublo de la Vaina de Arroz (*Rhizoctonia solani* – RHIZSO);
- Mancha Ocular del Trigo (*Pseudocercospora herpotrichoides*
- 25 – PSDCHE);

Putrefacción Marrón del Durazno (*Monilinia fructicola* – MONIFC); y

Mancha del Trigo (*Septoria nodorum* – LEPTNO).

Deberá quedar entendido por aquellos expertos en la técnica
5 que la eficacia del compuesto para los hongos anteriores establece
la utilidad general de los compuestos como fungicidas. Los
compuestos tienen amplios rangos de eficacia como fungicidas. La
cantidad exacta del material activo que va a ser aplicado depende,
no solamente del material activo específico que está siendo aplicado,
10 sino también de la acción particular deseada, la especie fungal que
va a ser controlada, y la etapa de crecimiento de la misma, así como
la parte de la planta u otro producto que va a ser puesto en contacto
con el compuesto. Por lo tanto, todos los compuestos y
formulaciones que contienen lo mismo, pueden no ser igualmente
15 efectivas en concentraciones similares o contra la misma especie
fungal.

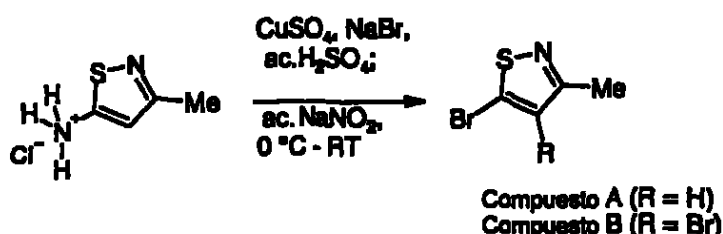
Los compuestos son efectivos en el uso con plantas en una
cantidad fitológicamente aceptable y que inhibe la enfermedad. El
término "cantidad fitológicamente aceptable y que inhibe la
20 enfermedad" se refiere a una cantidad de un compuesto que mata o
inhibe la enfermedad de la planta que se desea controlar, pero que
no es tóxico de una manera significativa para la planta. Esta
cantidad generalmente será desde aproximadamente 1 hasta
aproximadamente 1000 ppm, siendo preferido de 10 a 500 ppm. La
25 concentración exacta del compuesto requerido varía con la

enfermedad fungal que va a ser controlada, el tipo de formulación empleado, el método de aplicación, la especie particular de planta, las condiciones climatológicas y similares. Un índice adecuado de aplicación es generalmente en un rango de aproximadamente 0.10 hasta aproximadamente 1.814369 kg/4046.825 m² (4 libras/acre).

EJEMPLOS

Estos ejemplos son proporcionados para ilustrar adicionalmente la invención. No significan que deberán ser interpretados como una limitación de la invención.

10 Preparación de 5-bromo-3-metilisotiazol (Compuesto A) y 4,5-dibromo-3-metiliso-tiazol (Compuesto B)



Se disolvió clorhidrato de 5-Amino-3-metilisotiazol (1.0 g; 6.7 mmol) en ácido sulfúrico 9M (13.4 mL) a temperatura ambiente. Se le agregaron sulfato de cobre (II) (2.7 g; 16.8 mmol; 2.5 eq) y bromuro de sodio (2.4 g; 23.5 mmol; 3.5 eq), y la mezcla espesa resultante fue enfriada a una temperatura de 0°C en un baño de hielo. Se agregó lentamente en forma de gotas una solución de nitrito de sodio (5.8 mg; 7.4 mmol; 1.1 eq) en agua (2.5 mL), manteniendo la temperatura interna de < 10°C. Cuando se terminó la adición, continuó la agitación a una temperatura de 0°C durante 20 minutos y

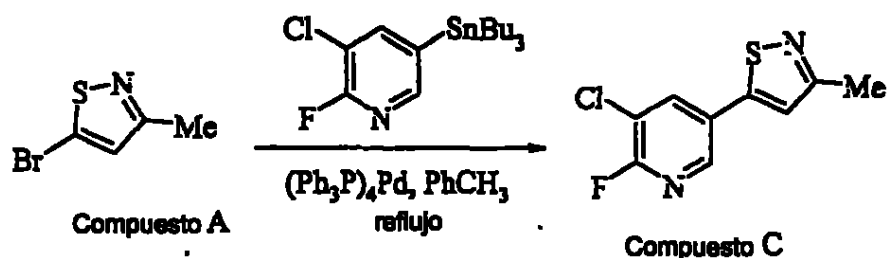
luego a temperatura ambiente durante 30 minutos hasta que ya no fue visible la evolución de nitrógeno. La mezcla de reacción fue vertida en agua (exotermia) en donde se agitó hasta que se disolvieron la mayor parte de los sólidos. La mezcla fue transferida a un embudo separador y extractada con éter dietílico (x 3). Las capas orgánicas combinadas fueron lavadas con salmuera y secadas sobre sulfato de sodio. Después de la remoción cuidadosa del solvente (sin calor) el residuo crudo fue purificado por cromatografía instantánea (5% acetato de etilo/hexano) para producir el Compuesto A (confirmado por GCMS, m/e 179) en un 28% de rendimiento (330 mg) y el Compuesto B (m/e 257) en una cantidad menor (no se midió el rendimiento).

Preparación de 4,5-dibromo-3-metiliso-tiazol (Compuesto B)
Método Dos.

Se calibró el clorhidrato de 5-Amino-3-metilisotiazol (3.1 g; 20 mmol) entre acetato de etilo y carbonato de sodio al 10%. La capa orgánica fue filtrada y evaporada al vacío hasta 2.25 g (~20 mmol) de 5-amino-3-metilisotiazol. Fue pulverizado y agregado a 100 mL de ácido bromhídrico al 48%. Se disolvieron 1.5 g (22 mmol) de nitrato de sodio en 5 mL de agua y se agregaron a la solución de material de partida a temperatura ambiente. Cuando la exotermia resultante fue terminada, se agregaron 5.8 g (40 mmol) de bromuro cuproso pulverizado con agitación y se dejó a temperatura ambiente ~5 horas. La mezcla fue inundada con 200 mL de agua, y posteriormente extractada con 1:1 éter/pentano. La capa orgánica

fue filtrada y evaporada al vacío hasta ~2 g de una goma amarilla. La cromatografía de capa delgada (SiO_2 /éter/hexano) mostró una mancha rápida pequeña y una grande, y una mancha ligeramente más lenta. La disolución en pentano con un volumen mínimo de éter, seguida por un lavado de extracción con ácido clorhídrico concentrado removió toda la mancha más rápida. La neutralización posterior de ésta última con 10% de hidróxido de amonio y la extracción del éter, seguida por evaporación del extracto, produjo 100 mg del Compuesto A con los datos correctos del espectro. La capa de ácido éter-lavado/pentano fue filtrada y evaporada al vacío a 1 g de la mancha mayor, un sólido naranja de bajo punto de fusión. Se confirmó que este era el Compuesto B por GCMS (m/e 257) y RMN ^1H (singlete en 2.6 ppm), y 39% del rendimiento recuperado.

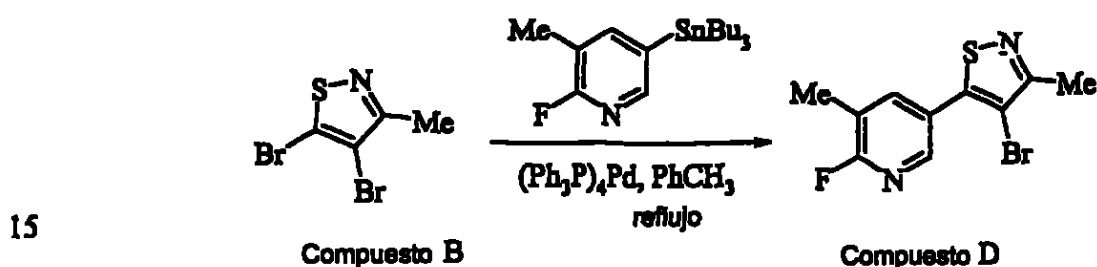
**Preparación de 3-cloro-2-fluoro-(3-metil-5-isotiazolil)piridina
(Compuesto C)**



Se disolvieron 5-Bromo-3-metilisotiazol (400 mg; 2.2 mmol; 1.1 eq) (Compuesto A), en tolueno (5 mL), y se le agregaron tetrakis(trifenilfosfina)paladio(0) (116 mg; 0.1 mmol; 0.05 eq). La mezcla fue cubierta con nitrógeno y calentada a una temperatura de 90°C para la adición de una solución de 3-cloro-2-fluoro-5-

(tributilestanil)piridina (838 mg; 2.0 mmol; 1 eq) en tolueno (2 mL). Esta mezcla fue calentada a reflujo durante toda la noche. Fue enfriada a temperatura ambiente, diluida con éter y filtrada a través de Celita para producir una solución color naranja, la cual se
 5 convirtió en un sólido amarillo naranja cuando el solvente fue removido. El GCMS mostró 2 productos principales correspondientes al Compuesto C deseado (m/e 228).

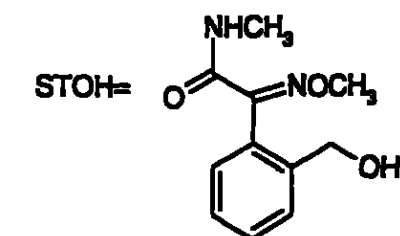
**Preparación de 2-fluoro-3-metil-(4-bromo-3-metil-5-
 isotiazolil)piridina
 10 (Compuesto D)**



Se disolvió 4,5-Dibromo-3-metilisotiazol (950 mg; 4 mmol) (Compuesto B) en tolueno (75 mL) y se le agregó tetrakis(trifenilfosfina)paladio(0) (240 mg; 0.2 mmol). Esta mezcla fue
 20 cubierta con nitrógeno y calentada a 90°C para la adición de una solución de 2-fluoro-3-metil-5-(tributilestanil)piridina (1.6 g; 4.0 mmol; 1 eq) en tolueno (2 mL). Esta mezcla fue calentada entonces a reflujo durante 2.5 horas. La cromatografía de capa delgada (hexano/éter) no mostró Compuesto B, y la presencia de una mancha
 25 del producto grande a la mitad del Rf. La suspensión fue filtrada y el

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Preparación de 2-[[[3-cloro-5-[5-[3-metilisotiazolil]]-2-piridinil]-oxil]metil]-alfa-(metoxilimino)-*N*-metilbencenoacetamida (Compuesto 1).

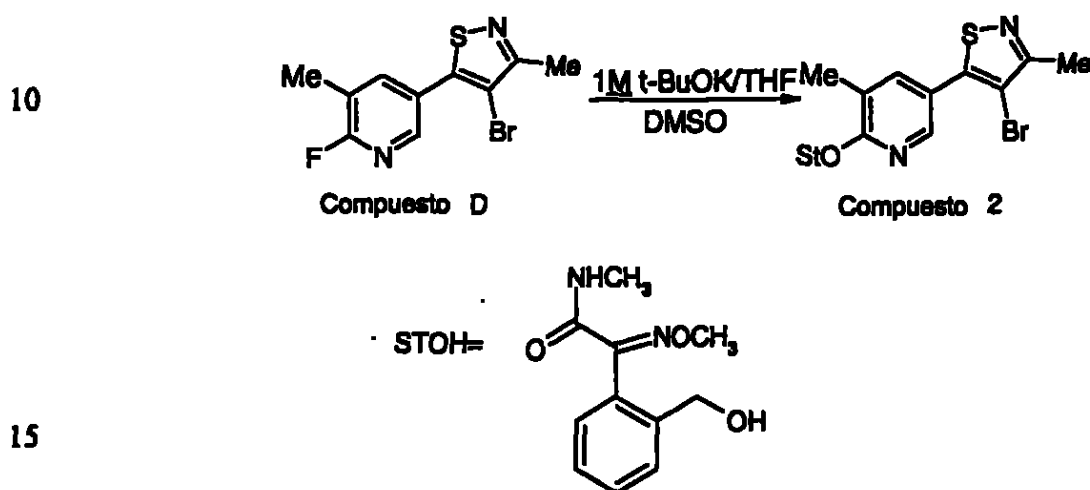


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mL), y se secó sobre sulfato de sodio anhidro. La evaporación del solvente bajo presión reducida y purificación del residuo por cromatografía sobre sílice (10 – 50% acetato de etilo/hexanos) produjo el producto deseado.

5 **Preparación de 2-[[[3-metil-5-[5-[4-bromo-3-metilisotiazolil]]-2-piridinil]-oxi]metil]-alfa-(metoxilimino)-N-metilbencenoacetamida**
(Compuesto 2).



El compuesto D (.72 g, 2.5 mmol) fue disuelto en 50 mL de DMSO anhidro. A este se le agregaron .56 g (2.5 mmol) de la metoxiliminoamida a la que nos referimos como StOH, con agitación y con purga de nitrógeno. Al momento de la inyección de 3 mL (3 mmol) de 1M t-BuOK/THF la solución tomó un color rojo oscuro. Después de la agitación durante 20 minutos, la cromatografía de capa delgada de un alícuota acidificado no mostró Compuesto D, y una mancha grande del producto en la mitad media del Rf. Se

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25 removió la mayor parte del DMSO al vacío, se inundó con 100 mL de

ácido clorhídrico diluido (Ph 4-5), y se extractó dos veces con acetato de etilo. El extracto filtrado y evaporado al vacío produjo 1.1 g de goma color naranja. Al eluirlo en una columna de sílice con 5:2 de éter/pentano para recolectar 0.75 g del producto principal en la forma de un aceite claro, el cual se convirtió en una espuma blanca dura en alto vacío prolongado, Pf = 48-53°C. GCMS m/e=490 (confirmación).

RESULTADOS BIOLÓGICOS

Propagación del patógeno e inoculación del huésped. Las plantas fueron inoculadas con varios patógenos de 1 a 4 días antes de la aplicación del compuesto (pruebas curativas), y de 1 a 7 días después de la aplicación del compuesto (pruebas protectoras). Para todos los ensayos en trigo, los compuestos fueron aplicados en una etapa 1.2 de crecimiento, cuando la segunda hoja se había extendido hasta aproximadamente $\frac{1}{4}$ de su tamaño final (12 días después de que las semillas fueron mojadas por primera vez). Más adelante se proporciona la información sobre las etapas de crecimiento de otras especies de plantas al momento de la aplicación del compuesto, y sobre los procedimientos de propagación e inoculaciones asociadas con cada uno de los patógenos.

ERYSGT: Las plantas de semilleros de trigo fueron infectadas con esporas frescas del patógeno obligado ERYSGT sacudiendo fuertemente las plantas de trigo infectadas sobre ellas. Las plantas que habían sido empolvadas con las esporas de ERYSGT, fueron incubadas en el Invernadero a una temperatura de 22°C, hasta que

habían desarrollado completamente los síntomas de la enfermedad (generalmente 7 días).

PUCCRT: Esporas del PUCCRT patógeno obligado fueron recolectadas de las plantas infectadas con un aparato de vacío y almacenadas a una temperatura de 4°C. Se mezclaron
5 aproximadamente 0.1 g de esporas frescas (almacenadas a 4°C por menos de 30 días) con varias gotas de Tween 20. La pasta gruesa de esporas fue diluida hasta 100 ml con agua y rociada para inocular las plantas de semillero de las semillas de trigo. Las plantas inoculadas
10 con PUCCRT se mantuvieron a una temperatura de 20°C en una cámara de rocío durante la noche, luego fueron transferidas a una cámara de crecimiento a una temperatura de 20°C en donde se desarrollaron los síntomas en un lapso de 8 a 9 días.

SEPTTR: El inóculo fresco es preparado de una manera similar
15 al que se describió para LEPTNO. En este caso, la capa café de esporas cubre la superficie completa de la placa de PDA y solamente unas cuantas placas son necesarias para obtener una gran cantidad de esporas. Después de la incubación durante la noche a una temperatura de 20°C en una cámara de rocío, las plantas inoculadas
20 fueron rociadas continuamente durante 3 días en un invernadero a una temperatura de 20°C, y luego se cultivaron a 20°C sin rocío hasta que se habían desarrollado completamente los síntomas de la enfermedad (generalmente en aproximadamente 10 días).

LEPTNO: El inóculo fue preparado rayando las placas de PDA
25 con exudados de la espora de una placa más vieja utilizando una

espátula estéril. Las placas fueron incubadas a una temperatura de 18°C bajo luces negras y generalmente produjeron grandes cantidades de esporas en un exudado rosa en un período de 6 a 7 días. Se vertió una cantidad pequeña de agua de la llave en varias
5 placas y las esporas fueron recolectadas, raspando los exudados de la superficie de PDA dentro del agua. Las soluciones de esporas fueron combinadas en un vaso de precipitación grande, diluidas con 200 a 300 ml de agua y filtradas a través de un colador de malla de 180 μ . La concentración de esporas fue determinada utilizando un
10 hemacitómetro y se le agregó agua para obtener una concentración final de 107 esporas/ml. Se agregaron aproximadamente 3 gotas grandes de Tween 20 por cada 100 ml de volumen y la solución de esporas fue rociada para inocular las plantas de semillero de trigo. Las plantas inoculadas fueron colocadas en una cámara de rocío a
15 una temperatura de 20°C durante la noche, y luego trasladadas al invernadero a una temperatura de 20°C en donde fueron rociadas continuamente (12 segundos de rocío cada minuto) hasta que habían desarrollado completamente los síntomas de la enfermedad (8 a 10 días).

20

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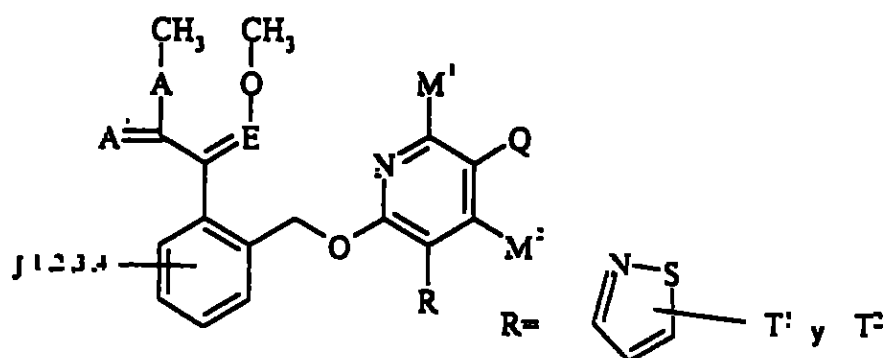
TABLA UNO "Datos Biológicos para los Compuestos 1-2"

Compuesto	Índice	ERYSGT	ERYSGT	LEPTNO	LEPTNO	PUCCRT	PUCCRT	SEPTTR	SEPTTR
	(g al/ha)	3DC	7DP	3DC	7DP	3DC	7DP	7DP	3DC
1	125	97	100	71	98	100	100	91	99
	82.5	94	88	53	95	100	100	76	85
	31.3	92	45	60	50	99	94	88	59
	15.5	88	51	58	46	83	80	53	22
2	125	falló	falló	67	98	93	100	97	95
	82.5			47	84	93	100	98	90
	31.3			73	79	63	100	85	83
	15.5			65	65	50	100	85	97

5

REIVINDICACIONES

1.- Un compuesto de acuerdo con la fórmula uno



Fórmula uno

A es seleccionado del grupo consistente de oxl (-O-) y amino (-NH-);

A¹ es seleccionado del grupo consistente de oxo (O=) y tioxo (S=);

15 E es seleccionado del grupo consistente de aza (-N=) y metina (-CH=);

J¹, J², J³, y J⁴ son seleccionados independientemente del grupo consiste de hidro (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁-₄, alcoxi C₁-₄, alquilo C₁-₄ (mono o multi- halo), y alquiltio C₁-₄;

20 M¹, y M² son seleccionados del grupo consistente de hidro (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁-₆, alcoxi C₁-₆, alquilo C₁-₄ (mono o multi- halo), y alquiltio C₁-₄, nitro (-NO₂), (mono o multi- halo) alcoxi C₁-₄, arilo (-Arilo), arilo substituido (-SArilo), heteroarilo (-HArilo), y heteroarilo substituido (-SHArilo), en donde "arilo" o "F" se refiere a
25 un grupo fenilo y en donde "heteroarilo" se refiere a piridilo,

piridinilo, pirazinilo o piridazinilo, en donde dicho SARilo y SHARilo tienen substituyentes que son seleccionados independientemente del grupo consistente de alquilo C₁-C₆, alcoxi C₁-C₆, halo-C₁-C₆ alquilo, halo-C₁-C₆ alcoxi, halo, nitro, alcoxi carbo-C₁-C₆, o ciano, arilalquilo, alcanoilo, benzoilo, amino, y amino substituido, de preferencia, hidro (-H), alquilos C₁-C₆, arilalquilo, alcanollo, benzoilo, amino, y amino substituido, en donde dicho amino substituido tiene los substituyentes que son seleccionados independientemente del grupo consistente de hidro (-H) alquilo, arilalquilo, alcanollo, benzoilo, y amino;

Q es seleccionado del grupo consistente de hidro, halo, ciano, (mono o multi halo) alquilo C₁₋₆, y alquilo C₁₋₆; y

T¹ y T² son seleccionados independientemente del grupo consistente de hidro (-H), halo (-F, -Cl, -Br, y -I), alquilo C₁₋₆, alcoxi C₁₋₆, alquilo C₁₋₄ (mono o multi- halo), y alquilo C₁₋₄, nitro (-NO₂), (mono o multi- halo) alcoxi C₁₋₄, arilo (-Arilo), arilo substituido (-SARilo), heteroarilo (-HArilo), y heteroarilo substituido (-SHArilo), en donde "arilo" o "F" se refiere a un grupo fenilo y en donde "heteroarilo" se refiere a piridilo, piridinilo, pirazinilo, o piridazinilo, y en donde dicho SARilo y SHArilo tienen substituyentes que son seleccionados independientemente del grupo consistente de alquilo C₁-C₆, alcoxi C₁-C₆, alquilo halo-C₁-C₆, alcoxi halo-C₁-C₆, halo, nitro, alcoxi carbo-C₁-C₆, o ciano, arilalquilo, alcanollo, benzoilo, amino, y amino substituido de preferencia, hidro (-H), alquilos C₁-C₆, arilalquilo, alcanoilo, benzoilo, amino, y amino substituido, en donde

dicho amino substituido tiene substituyentes que son seleccionados independientemente del grupo consistente de hidro (-H), alquilo, arilalquilo, alcanilo, benzoilo, y alquil amino-C₁₋₄ o uno de los enlaces sencillos que pueden ser los enlaces de conexión al piridilo.

5 2.- Un compuesto tal y como se describe en la reivindicación 1, en donde A es amino (-NH-).

3.- Un compuesto tal y como se describe en la reivindicación 1, en donde A¹ es oxo (O=).

10 4.- Un compuesto tal y como se describe en la reivindicación 1, en donde E es aza (-N=).

5.- Un compuesto tal y como se describe en la reivindicación 1, en donde J¹, J², J³, y J⁴ son hidro (-H).

6.- Un compuesto tal y como se describe en la reivindicación 1, en donde M¹, y M² son hidro (-H).

15 7.- Un compuesto tal y como se describe en la reivindicación 1, en donde Q es halo.

8.- Un compuesto tal y como se describe en la reivindicación 1, en donde T¹ y T² son seleccionados independientemente del grupo consistente de hidro (-H), halo (-F, -Cl, -Br, y -I), y alquilo C₁₋₆.

20 9.- Un compuesto tal y como se describe en la reivindicación 1, en donde A es amino (-NH-); A¹ es oxo (O=); E es aza (-N=); J¹, J², J³, y J⁴ son hidro (-H); M¹, y M² son hidro (-H); Q es halo; y T¹ y T² son seleccionados independientemente del grupo consistente de hidro (-H), halo (-F, -Cl, -Br, y -I), y alquilo C₁₋₆.

10.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 1, para controlar o prevenir un ataque fungal en un lugar.

5 11.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 2, para controlar o prevenir un ataque fungal en un lugar.

10 12.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 3, para controlar o prevenir un ataque fungal en un lugar.

15 13.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 4, para controlar o prevenir un ataque fungal en un lugar.

20 14.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 5, para prevenir o controlar un ataque fungal en un lugar.

25 15.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 6, para prevenir o controlar un ataque fungal en un lugar.

16.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 7, para prevenir o controlar un ataque fungal en un lugar.

5 17.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 8, para prevenir o controlar un ataque fungal en un lugar.

10 18.- Un proceso que comprende la aplicación de una cantidad fungicida de un compuesto tal y como se describe en la reivindicación 9, para prevenir o controlar un ataque fungal en un lugar.

RESUMEN

La presente invención proporciona 2-metoxilmino-
2(piridiniloximetil) fenil acetamidas con un anillo isotiazolilo en el
5 anillo de piridina de acuerdo con la fórmula (I) así como su uso como
compuestos fungicidas.

Caveller Abogados

~~2585~~

~~180~~ N.E.

74

De: Sistemas Olivares & Cia. [sistemas@olivares.com.mx]

Enviado: Martes, 11 de Marzo de 2003 02:53 p.m.

Para: Caveller Abogados

Nº 4577

Asunto: TRADUCCION AL ESPAÑOL DE LA PATENTE PCT/US01/29351 - OLIVARES & CIA - Nuestra ref.: 03P0219 / DOW AGROSCIENCES ref.: 60,826A

Estimados señores:

Siguiendo las instrucciones de los señores de Dow AgroSciences, sirvanse encontrar adjunto el archivo conteniendo la traducción al Español de la solicitud de Patente arriba identificada.

Sin más por el momento quedamos de ustedes

Atentamente

Reg. 17/3/03
18-875

OLIVARES & CIA

Ing. Javier Saucedo C.
ale

127

11/03/03



75

Industria y Comercio**SUPERINTENDENCIA**

SUPERINDUSTRIA Y COMERCIO

Radicación : 03022047 00000000

Folios: 75

Fecha (ANO): 2003-03-18 17:14:16

Trámite : 011 PCT-PATENT 379 FASE NACI 411 PRESENTA

Secundaria: PAGO DIVISION DE MARCAS E INVENCIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 03 - 17,216
FECHA : MARZO 10 DE 2003

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	9005687	10/03/2003	20,101,000.00

***** CONCEPTO *****

CANT. CONTABILITICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	400,000.00
	TOTAL :	\$ 400,000.00

SON: CUATROCIENTOS MIL PESOS

RESPONSABLE :

Cob

10475-841-004-6

RECIBO DE CAJA APLICADO AL EXPEDIENTE N°.

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Bogotá, D.C., Colombia

REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL
TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION	()	()
MODELO DE UTILIDAD	()	()
- Indicación de que se solicita la concesión de una patente.	()	(y)
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	(x)
- Descripción de la invención.	()	()
- Dibujos de ser estos pertinentes.	()	(x)
- Comprobante de Pago de las tasas establecidas.		
COMPLETA (x)	INCOMPLETA ()	()
DISEÑO INDUSTRIAL ()		
- Indicación de que se solicita el registro de Diseño Industrial	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica y fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
Comprobante de pago de las tasas establecidas	()	()
COMPLETA ()	INCOMPLETA ()	()
ESQUEMA DE TRAZADO ()		
- Indicación de que solicita el registro de un Esquema de trazado.	()	()
- Datos de identificación del solicitante o de la persona que presenta La solicitud.	()	()
Representación gráfica del esquema de trazado	()	()
Comprobante de pago de las tasas establecidas.	()	()
COMPLETA ()	INCOMPLETA ()	()

Educa Nogueira
Firma Responsable:

18-03-03

Fecha:



2020

Folio 77
Bogotá, D.C.,

Doctor:
Emilio Ferrero
Apoderado
Dow Agrosciences LLC.

Oficio N°
07486

ASUNTO:	Radicación N°	03-022847
	Solicitud Internacional	PCT/US2001/29351
	Fecha inicio fase nacional	19/04/2003
	Trámite	011
	Evento	379
	Actuación	430
	Folios	001

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

- ☐ La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente del inventor al solicitante o a su causante. (Art. 28-k) Decisión 486).

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista de fecha, 72 SET. 2003.