



DIVISION DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No 03-003729

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

PCT FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **543**

DE FECHA **01 DE SEPTIEMBRE DE 2004** EL TERMINO HABIL EÑALADO POR

LA LEY EXPIRA EL **29 DE NOVIEMBRE DEL 2004**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI - _____ NO _____ X _____

Bogotá D.C, SEPTIEMBRE DE 2007

REGISTRO DE LA PROPIEDAD INDUSTRIAL



ESPAÑA

PATENTE DE INVENCION

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64 TITULO DE LA INVENCION "UN PROCEDIMIENTO PARA PREPARAR UNA COMPOSICION FUNGICIDA AGRICOLA A BASE DE IPRODIONA"
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1 ~~La presente invención se refiere a un procedimiento para preparar una nueva composición fungicida a base de iprodiona.~~

5 La iprodiona es el nombre conocido para denominar a un fungicida agrícola cuya denominación química es isopropil-carbamoil-1-(dicloro-3,5-fenil)-3-hidantoína. Este fungicida ~~presenta una excelente actividad contra las enfermedades fúngicas de las plantas~~, y en particular la botritis de la vid.

10 Hasta ahora, esta materia activa se ha comercializado esencialmente en forma de polvo humectable. Esta formulación presenta el inconveniente de la dispersión de los polvos en la atmósfera en el momento de la manipulación, bien durante el envasado o ensacado, o bien en el momento de la dilución del polvo humectable en agua al preparar la lechada. Por otro lado, esta formulación puede ser arrastrada de la superficie de las hojas o de los granos en caso de lluvias intensas.

15 La presente invención tiene por objeto paliar estos inconvenientes. ~~Tiene por objeto una composición fungicida agrícola basada en iprodiona, caracterizada porque~~ contiene, en peso:

20 a) de 20 a 40% de una materia activa a base de iprodiona.

25 b) ~~una emulsión de tipo de "aceite en agua"~~ que comprende de 50 a 160% en peso, con relación a la iprodiona, de un aceite de un equilibrio hidrófilo/lipófilo (BHL) de un valor de 8 a 12, y preferiblemente 10 a 11, en la escala de BHL requerida para la preparación de una emulsión de "aceite en agua".

30 c) de 0,1 a 2% de un emulsionante no ióni-

1 co del tipo de alcohol graso etoxilado,

d) eventualmente, de 0,5 a 2,5% de una sílice hidrófila sensiblemente neutra, estando constituido el resto hasta 100% por agua y los editivos usuales.

5 ~~Las composiciones según la invención son~~
~~suspensiones concentradas de iprodiona en una emulsión de~~
~~aceite en agua.~~ Estas emulsiones flúidas se llaman frecuen-
temente en la práctica "pastas flúidas", "cremas", o, según
la expresión inglesa, "aptas para fluir".

10 En estas composiciones, la materia activa
está basada en iprodiona, en forma de partículas sólidas,
cuyo diámetro medio es inferior a 10 micras, y preferible-
mente con un diámetro medio de 1 a 5 micras.

15 ~~En estas suspensiones, la materia activa~~
~~puede comprender, además de la iprodiona, otras materias ac-~~
~~tivas, tales como,~~ particularmente, carbenzamina, benconil o
metiltiofanato, o un compuesto a base de cobre, un etilenbis
ditiocarbemato metálico, tal como maneb, zineb o manzocob, o
un derivado de ftalimida tal como captano, captafol o fol-
20 pel.

~~Sin embargo, pueden formularse según la~~
~~presente invención otras mezclas en que la iprodiona va aso-~~
~~ciada con otros fungicidas.~~

25 El aceite utilizable en las composiciones
según la invención puede ser de naturaleza diversa, siempre
que pueda disolver de 1 a 5 g de iprodiona por litro de acei-
te a temperatura ordinaria, y que tenga un valor de equili-
brio hidrófilo/lipófilo (BHL), en la escala de los BHL re-
queridos para la preparación de una emulsión de "aceite en
30 agua", de 8 a 12, y preferiblemente de 10 a 11, y tenga pre-

1 feriblemente una viscosidad comprendida entre 20 y 30 cst.
El equilibrio "hidrófilo/lipófilo" está definido y determi-
nado en "Pesticida formulation", Waden Van Valkenburg, Edi-
ciones Marcel Dekker Inc., Nueva York, 1973.

5 Estos aceites pueden ser minerales, como
los aceites de petróleo refinados, llamados comúnmente acei-
tes blancos, de un intervalo de ebullición comprendido entre
300 y 400°C a presión atmosférica, de contenido elevado en
hidrocarburos parafínicos, y preferiblemente con un conteni-
10 do mínimo de 92% de insulfonables. Pueden emplearse igual-
mente ciertos aceites vegetales, de un valor del equilibrio
hidrófilo/lipófilo comprendido en el intervalo definido an-
tes, tales como por ejemplo aceite de cacahuet, aceite de
semilla de maíz o aceite de colza.

15 Otro constituyente importante de la compo-
sición según la invención es un emulsionante particular del
tipo de alcohol graso etoxilado, producto de condensación
de uno o varios alcoholes grasos lineales o ramificados de
C₁₂ a C₁₄, y preferiblemente C₁₃, con 8 a 12 moles, y prefe-
20 riblemente de 9 a 10 moles, de óxido de etileno, que asegura
la estabilidad de la suspensión concentrada de iprodiona en
la emulsión de aceite en agua, actuando al mismo tiempo como
dispersante-humectante de la iprodiona y emulsionante del
sistema binario "aceite-agua".

25 En ciertos casos, cuando se quiere dismi-
nuir la cantidad de aceite para reducir una eventual fitoto-
xicidad sin perjudicar a las propiedades biológicas de la
formulación, puede ser ventajoso añadir de 0,5 a 2,5% en pe-
so de una sílice hidrófila, que se prefiere sensiblemente
30 neutra. Se entiende por sílice hidrófila, en el contexto de

1 la invención, una sílice preferiblemente sintética tal como
una sílice precipitada hidratada ultrafina, de superficie
específica elevada, del orden de 200 a 300 m²/g, medida por
el método B.E.T. Una sílice tal es sensiblemente neutra, es
5 decir su pH en suspensión acuosa es de 7±0,5. En la prácti-
ca, se prefiere una sílice neutra o débilmente ácida.

~~Las composiciones según la invención pue-~~
~~den contener además los coadyuvantes clásicos,~~ como agentes
de viscosidad (en general, de 0,05 a 0,1% en peso) del tipo
10 de polisacáridos, particularmente heteropolisacáridos re-
sultantes de la fermentación de hidratos de carbono por un
microorganismo del tipo de xantomonas, dispersantes-fluidi-
ficantes del tipo de poliarilfenol, particularmente poliesti-
rilfenol etoxilado, preferiblemente en forma de fosfato áci-
15 do (en general de 0,5 a 2,5% en peso), anticongelantes ta-
les como etilenglicol o propilenglicol (en general de 5 a
10% en peso), antiespumantes tales como emulsiones de acei-
tes de siliconas (generalmente de 0,2 a 0,6% en peso) y
agentes conservadores contra la proliferación microbiana
20 (en general de 0,1 a 0,2% en peso) como formol.

Las composiciones según la invención pue-
den prepararse por ejemplo en tres etapas.

La primera consiste en preparar la emul-
sión de "aceite en agua" en un recipiente provisto de agita-
25 ción vigorosa, vertiendo el aceite en el agua que contiene
los demás aditivos hidrosolubles y eventualmente el emulsio-
nante.

En una segunda etapa, se dispersa la ipro-
diona, en polvo fino, en la emulsión oleosa, siempre con
30 agitación. La suspensión obtenida se afina a continuación

1 en un molino, por ejemplo del tipo de bolas, como el molino
DYNMO-MILL.

5 En la tercera y última etapa, el agente
de viscosidad del tipo de heteropolisacárido se dispersa en
una pequeña cantidad de agua que contiene el agente conser-
vador (formol al 40% en disolución acuosa) y/o la sílice hi-
drófila neutra. Esta dispersión se incorpora en la suspen-
sión de iprodiona descrita anteriormente.

10 ~~Las composiciones oleosas de iprodiona se-
gún la invención tienen, además de la ventaja de una formu-
lación fluida de manipulación más fácil que un polvo humec-
table,, el interés de mostrar una mayor eficacia fungicida,
cuando se aplica en tratamiento de pulverización para luchar
contra las enfermedades por hongos de las plantas (vid, le-
chuga, tomate, fresa, árboles de pequeños frutos, etc), y
15 en particular contra la botritis (Botrytis cinerea), sin pre-
sentar fitotoxicidad.~~

20 Los ejemplos siguientes se dan de modo no
limitativo para ilustrar las composiciones según la inven-
ción y sus propiedades biológicas notables.

Ejemplo 1

25 Se prepara una suspensión oleosa concentra-
da de la siguiente composición en tanto por ciento en peso:

Iprodiona con un diámetro de	
partículas del orden de 2	
micras	25,0

Aceite mineral parafínico de	
más de 70% de parafina, de	

1 prepara una suspensión oleosa concentrada de la siguiente
composición, en tanto por ciento en peso:

	Iprodiona	37,5
5	Aceite mineral de más de 70% de parafinas, con un valor de equilibrio hidrófilo/li pófilo igual a 11, y que so lubiliza 1 g de iprodiona por litro de aceite	20,0
10	Etilenglicol	5,0
	Alcoholes sintéticos de C ₁₃ etoxilados con 9-10 moles	1,0
	Fosfato ácido de poliarilfe- nol etoxilado	1,5
15	Emulsión de aceite de sili- cona	0,5
	Sílice precipitada hidrófila neutra (superficie BET, 300 m ² /g)	1,25
20	Agua, c.s.p.	100

Ejemplo 4

25 Según el procedimiento del ejemplo 1, se
prepara una suspensión oleosa concentrada con la composi-
ción siguiente, en tanto por ciento en peso:

	<u>Iprodiona</u>	37,5
30	<u>Aceite de cacahuet industrial,</u> que solubiliza 3,5 g de iprodiona por litro	20,0

1	Etilenglicol	5,0
	Alcoholes sintéticos de C ₁₃ etoxilados con 9 a 10 moles	1,0
5	Fosfato ácido de poliesti- rilfenol etoxilado	2,0
	Emulsión de aceite de sili- cona	0,5
	Sílice hidrófila neutra	1,0
10	Agua, c.s.p.	100

Ejemplo 5

15 Según el procedimiento del ejemplo 1, se prepara una suspensión oleosa concentrada que tiene la composición siguiente, en tanto por ciento en peso:

	Iprodiona	26,0
20	Aceite mineral parafínico de más de 70% de parafina, con un valor de BHL igual a 10,5, y que solubiliza 4,5 g de iprodiona por litro	32,2
25	Emulsionante a base de alcoho- les sintéticos de C ₁₃ eto- xilados con 9-10 moles de óxido de etileno	0,8
	Fosfato de poliestirilfenol etoxilado	2,5
30	Polialcoholilfenol etoxilado	0,5



US005580567A

United States Patent [19]**Roberts**[11] **Patent Number:** **5,580,567**[45] **Date of Patent:** ***Dec. 3, 1996**

[54] **HOMOGENEOUS, ESSENTIALLY
NONAQUEOUS ADJUVANT COMPOSITIONS
WITH BUFFERING CAPABILITY**

[75] **Inventor:** **Johnnie R. Roberts, Memphis, Tenn.**

[73] **Assignee:** **Helena Chemical Company, Memphis,
Tenn.**

[*] **Notice:** The term of this patent shall not extend
beyond the expiration date of Pat. No.
5,178,795.

[21] **Appl. No.:** **394,839**

[22] **Filed:** **Feb. 27, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 960,894, Oct. 14, 1992, Pat.
No. 5,393,791, and Ser. No. 554,359, Jul. 19, 1990, Pat. No.
5,178,795.

[51] **Int. Cl.⁶** **A01N 25/02; A01N 27/00;
B01J 13/00**

[52] **U.S. Cl.** **424/405; 71/DIG.1; 252/312;
252/356; 514/762; 514/941**

[58] **Field of Search** **252/321, 356,
252/DIG.1; 514/762, 94.1; 71/DIG. 1; 510/437;
424/405**

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Primary Examiner—Richard D. Lovering
Attorney, Agent, or Firm—Connolly & Hutz

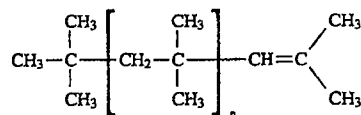
[57] **ABSTRACT**

A homogeneous, essentially nonaqueous adjuvant composi-
tion containing at least one spray oil selected from the group
consisting of

- (a) vegetable oils;
- (b) fatty acids and blends thereof;
- (c) esterified fatty acids or blends thereof;
- (d) saponified fatty acids or blends thereof;
- (e) N,N-dimethylamide of the formula



(f) polybutenes of the following formula



a surfactant in an effective amount to emulsify said
composition and a buffering agent in amount sufficient to
reduce the pH to below about 7.

30 Claims, No Drawings

5,580,567

1

HOMOGENEOUS, ESSENTIALLY NONAQUEOUS ADJUVANT COMPOSITIONS WITH BUFFERING CAPABILITY

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of Ser. No. 07/960,894, which was filed Oct. 14, 1992 and is now issued as U.S. Pat. No. 5,393,791 and a continuation-in-part of Ser. No. 07/554,359, which was filed Jul. 19, 1990 and is now issued as U.S. Pat. No. 5,178,795.

The present invention relates to the field of agricultural, forestry, turf, ornamental, industrial, aquatic, rights-of-ways and other applications where pesticides are used and, more specifically, to adjuvant compositions which improve the chemical and physical properties of a pesticide such as an herbicide, insecticide or fungicide.

BACKGROUND OF THE INVENTION

In order to enhance or modify the chemical and/or physical characteristics of certain pesticides, certain materials are added to form a mixture for spraying. Generally referred to as adjuvants, these materials have no pesticidal activity of their own. Since spray application can be critical to the performance of the agricultural chemical, adjuvants are added to reduce application problems such as chemical stability, incompatibility, solubility, suspension, foaming, drift, evaporation, volatilization, phytotoxicity, surface tension, droplet size and coverage. They can, depending on their type, enhance wetting, spreading, sticking, emulsifying, dispersing and biological activity. Adjuvants include wetting agents, crop oil concentrates, spreaders, stickers, buffering agents, foaming and anti-foaming agents, dispersing agents and drift control agents. Over 200 EPA-registered pesticides have specific recommendations on their labels for adjuvant use. These are recommended for one of two reasons—or both. First, to enhance biological activity of the pesticide and second, to reduce, minimize or eliminate spray application problems as noted previously. There are several different types of adjuvants recommended. To achieve consistent, effective results from them, the user must first select the desired type of adjuvant and then the appropriate product within that specific type for use with a particular pesticide and then use that product at recommended rates.

It is known that petroleum hydrocarbon spray oils increase the efficacy of herbicides, fungicides and other pesticides by enhancing the deposition characteristics and wetting and spreading of the spray solution resulting in a more even and uniform spray deposit or by increasing the biological effect of certain pesticides. Other oils such as esterified vegetable oils and once-refined vegetable oils are known to exhibit similar properties. Such spray oils can increase penetration and slow evaporation. Paraffin based spray oil is a petroleum oil used as dormant spray, summer oil, carrier for pesticides or an adjuvant to increase the efficacy of agricultural chemicals.

In U.S. Pat. No. 3,977,322, an agricultural spray oil composition comprising a major amount of a petroleum oil and a minor amount of a vegetable oil is disclosed as providing a particularly improved carrier which enhances the effectiveness of selective herbicides.

A synergistic herbicidal composition is disclosed in U.S. Pat. No. 4,755,207 and comprises a non-phytotoxic crop oil, a surfactant, and hydrophobic mycoherbicide spore. The oils

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are once refined vegetable oils or highly refined paraffinic material. The surfactant can be anionic, cationic or nonionic.

A surfactant composition is disclosed in U.S. Pat. No. 4,317,847 issued to Chasin. Chasin discloses a solvent having a high aromatic content above 95% which corresponds to a very low UR value.

Some applications require the separate addition of buffering agents to adjust the pH of alkaline waters used to make up the spray solutions. The buffering agents regulate solution pH to avoid hydrolysis of pesticides that tend to decompose in alkaline spray solutions. Generally, the spray's pH should be adjusted to a range of 4 to 6 or slightly acidic. Known buffering agents include alkyl aryl polyethoxy ethanol phosphates and organic phosphatic acids as the principal functioning agents. Typically, such a buffering agent is added to the water which is then combined with the pesticide and any other adjuvants required.

U.S. Pat. No. 4,244,049 relates to aqueous-lower alkanol solutions containing alkylaryl polyoxyethylene glycol phosphate esters which act as compatibility agents for mixtures of liquid fertilizer and pesticides. The solution contains about 20% methanol, about 16% water and about 64% of the phosphate ester.

A biocidal fine powder and an agricultural suspension containing the fine powder and an adjuvant are disclosed in U.S. Pat. No. 4,851,421. The adjuvant can be a polyoxyalkylene-type nonionic surface active agent or polyoxyalkylene alkyl or alkylaryl ether phosphates or their salts. The composition does not include any oil components.

It is advantageous to reduce the separate addition of each of the adjuvants to the herbicide or pesticide to save time and to reduce possibility of error in the amounts added since mixing is typically done in the field by unskilled workers. However, the components of an adjuvant composition must form a homogeneous liquid mixture, not a slurry or suspension. Otherwise, the amount of oil and surfactant in the spray will vary from use to use and these variations would adversely affect the physical properties of the spray. In the prior compositions, adjuvants such as buffering agents have been added to the water, then combined with the other adjuvants and the active ingredient because the phosphate compounds used as buffering agents are hydrophilic polar compounds. It is difficult to combine such compounds with oil and obtain a homogeneous composition having the desired spray uniformity and coverage.

It is the object of this invention to provide an essentially non-aqueous, single-phase adjuvant composition containing oil plus surfactant blend and which provides buffering capability. Even after the addition of alkaline water and pesticides, use of this composition reduces and/or maintains the pH of the spray mixture within a desired range to prevent hydrolysis of the pesticide.

SUMMARY OF THE INVENTION

The present invention is a homogeneous, essentially non-aqueous adjuvant composition comprising a spray oil, a surfactant and a buffering agent in an amount to reduce the pH to below about 7. When mixed with a pesticide, the composition provides one-step addition of the adjuvants to obtain a more uniform spread of the spray solution of the herbicide or pesticide, improved penetration and slower evaporation. The adjuvant can also be used as a pesticide or herbicide without the addition of any additional pesticide to the adjuvant. The presence of the buffering agent maintains the pH of the mixture within a desired range pH below about

7 in the presence of alkaline waters typically used in spray solutions.

DETAILED DESCRIPTION OF THE INVENTION

This invention is a homogeneous, essentially nonaqueous adjuvant composition having buffering capability. According to the process of this invention, the adjuvant composition comprises a spray oil and a blend of surfactants and buffering agent. The preferred homogeneous, essentially nonaqueous adjuvant composition comprises:

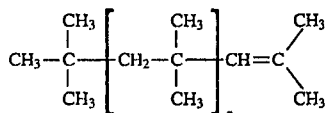
(1) at least one spray oil selected from the group consisting of:

- (a) vegetable oils;
- (b) fatty acids and blends thereof;
- (c) esterified fatty acids or blends thereof;
- (d) saponified fatty acids or blends thereof;
- (e) N,N-dimethylamide of the formula



wherein R is an alkyl chain derived from fatty acids having about 6 to about 18 carbon atoms;

(f) polybutenes of the following formula



where n is a number from about 1 to about 50%

- (2) a surfactant in an effective amount to provide emulsification of said composition and
- (3) a buffering agent in an amount sufficient to reduce the pH to below about 7.

The spray oils utilized in this composition do not have an unsulfonated residence (UR) value and include at least one of the following:

1. Vegetable oils:

the vegetable oils can be, but are not limited to vegetable seed oil or a mixture of vegetable seed oils, as they are known in the agricultural industry, crop seed oils which are produced from the particular crop from which their name is derived. Included in the vegetable oils suitable for the compositions of the present invention are cotton seed oil, canola, rapeseed, peanut oil, sunflower oil, linseed oil, safflower oil, soybean oil, corn oil, olive oil, coconut oil, tall oil or other seed oils and blends of the above oils such as cotton seed oil plus soybean oil; cotton seed oil plus peanut oil; cotton seed oil plus olive oil; corn oil plus linseed oil; corn oil plus soybean oil; as well as blends of any two or more of the above disclosed vegetable oils. The vegetable oils can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 80 to about 99%.

2. Fatty acids and blends thereof:

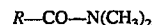
Such as, but not limited to saturated and unsaturated fatty acids of about 6 to about 18 carbon atoms. The fatty acids and blends can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 80 to about 99%.

3. Esterified fatty acids or blends thereof:

Such as, but not limited to saturated and unsaturated esters of about 6 to about 18 carbon atoms. The esterified fatty acids can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 50 to about 80%. The esterified fatty acids may also be derived from any of the vegetable oils previously mentioned.

4. Saponified fatty acids or blends thereof:

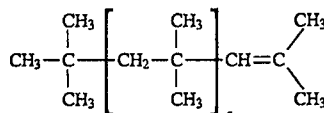
Such as, but not limited to saturated and unsaturated soaps of about 6 to about 18 carbon atoms. The saponified fatty acids can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 50 to about 80%. The saponified fatty acids may also be derived from any of the vegetable oils previously mentioned. N,N dimethylamides of the following formula:



wherein R is an alkyl chain derived from fatty acids having about 6 to about 18 carbon atoms. The N,N dimethylamides can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 80 to about 99 %.

6. Polybutenes:

The polybutenes that can be used are of the following formula:



where n is a number from about 1 to about 50. The polybutenes can be present in an amount from about 1 to about 99%, preferably from about 50 to about 99% and most preferably from about 80 to about 99%.

7. Mixture of at least one of 1-6 above.

These 6 groups of oils can be a portion of the spray oil or the entire spray oil.

The spray oil is used in combination with one or more of the buffering agents and should be mixed with one or more of the surfactants below. The surfactant is present in an effective amount to provide emulsification of the composition. The amount of the surfactant is usually in the range of about 5.0 to about 19.5% by weight. The preferred blend of surfactants include but are not limited to

- a) sorbitan fatty acid ester,
- b) polyethoxylated derivative of a sorbitan fatty acid ester,
- c) fatty alkanolamides of the formula

