

(19) AUSTRALIAN PATENT OFFICE

(54) Title
Emulsifiable concentrate

(51)⁶ International Patent Classification(s)
A01N 43/40 (2006.01) ^{6BHAU} **A01N**
A01N 37/04 (2006.01) 37/34
A01N 37/34 (2006.01) 20060101ALI2006031
A01N 43/50 (2006.01) ^{6BHAU} **A01N**
A01N 47/06 (2006.01) 43/50
A01N 43/40 20060101ALI2006031
20060101AFI2006031 ^{6BHAU} **A01N**
^{6BHAU} **A01N** 47/06
37/04 20060101ALI2006031
20060101ALI2006031 ^{6BHAU}

(21) Application No: 2006200731 (22) Application Date: 2006 .02 .22

(30) Priority Data

(31) Number	(32) Date	(33) Country
2005-286832	2005 .09 .30	JP
2005-281349	2005 .09 .28	JP
2005-101694	2005 .03 .31	JP
2005-275323	2005 .09 .22	JP

(43) Publication Date : 2006 .10 .19
(43) Publication Journal Date : 2006 .10 .19

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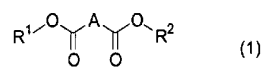
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(56) Related Art
WO 1998/048624 A1
US 2005064004 A1
US 6566308 B1
US 4875925

EMULSIFIABLE CONCENTRATE

Abstract

An emulsifiable concentrate containing the compound shown by the formula (1):



5

surfactant and

2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide has a high stability of the emulsion even after diluted with water.

2006200731 22 Feb 2006

S&F Ref: 753620

AUSTRALIA

PATENTS ACT 1990

COMPLETE SPECIFICATION

FOR A STANDARD PATENT

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Invention Title:	Emulsifiable concentrate

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

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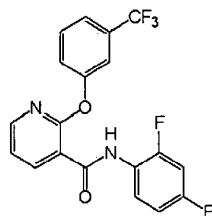
EMULSIFIABLE CONCENTRATE

FIELD OF THE INVENTION

The present invention relates to a pesticidal emulsifiable
 5 concentrate which contains
 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide
 as a herbicidal active ingredient.

BACKGROUND ART

It is known that
 10 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide
 shown by the below formula is an active ingredient of herbicide
 in USP-4618366.

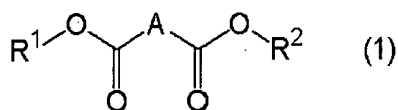


DISCLOSURE OF THE INVENTION

The present invention provides an emulsifiable
 concentrate containing
 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide
 20 as a herbicidal active ingredient which has an excellent stability
 of the emulsion even after diluted with water.

According to the present invention, an emulsifiable
 concentrate containing
 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide,
 25 the compound shown by the formula (1):

2006200731 22 Feb 2006



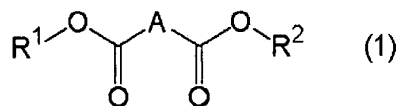
wherein, in the formula, R^1 and R^2 represent alkyl groups, A represents a single bond or an alkylene group, and the sum of the number of carbon atoms which consist of the groups of R^1 ,

5 R^2 and A is 2 to 8; and

a surfactant has an excellent stability of the emulsion even after diluted with water.

Namely, the present invention is as follows:

- 10 [1] An emulsifiable concentrate, which is characterized by comprising 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide; the compound shown by the below formula (1):

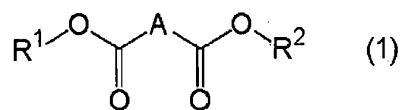


- 15 wherein, in the formula, R^1 and R^2 represent alkyl groups, A represents a single bond or an alkylene group, and the sum of the number of carbon atoms which consist of the groups of R^1 , R^2 and A is 2 to 8; and a surfactant.

- 20 [2] An emulsifiable concentrate, which is characterized by comprising 0.5 to 5 % by weight of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide; 5 to 80 % by weight of the compound shown by the below formula
- 25 (1):

22 Feb 2006

2006200731



wherein, in the formula, R^1 and R^2 represent alkyl groups, A represents a single bond or an alkylene group, and the sum of the number of carbon atoms which consist of the groups of R^1 ,

5 R^2 and A is 2 to 8; and

4 to 20 % by weight of a surfactant.

[3] The emulsifiable concentrate according to [1] or [2], wherein the compound shown by the formula (1) is diethyl oxalate.

10 [4] The emulsifiable concentrate according to any one of [1] to [3], wherein the ratio of the compound shown by the formula (1) is 5 to 80 by weight for one weight of

2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinamide.

[5] The emulsifiable concentrate according to any one
15 of [1] to [4], wherein the emulsifiable concentrate comprises an aromatic hydrocarbon.

[6] The emulsifiable concentrate according to any one of [1] to [4], wherein the emulsifiable concentrate comprises 1 to 40 % by weight of an aromatic hydrocarbon.

20 [7] The emulsifiable concentrate according to any one of [1] to [6], wherein the emulsifiable concentrate comprises 1,3-dimethyl-2-imidazolidinone.

[8] The emulsifiable concentrate according to any one of [1] to [6], wherein the emulsifiable concentrate comprises
25 5 to 60 by weight of 1,3-dimethyl-2-imidazolidinone.

[9] The emulsifiable concentrate according to any one of [1] to [8], wherein the surfactant is an anionic surfactant

22 Feb 2006

2006200731

and a nonionic surfactant; and the ratio by weight of the anionic surfactant and the nonionic surfactant is 1:0.1 to 1:10.

[10] The emulsifiable concentrate according to [9], wherein the anionic surfactant is an alkylbenzenesulfonic acid salt.

[11] The emulsifiable concentrate according to [9] or [10], wherein the nonionic surfactant is the nonionic surfactant which has polyalkylene oxide structure in the molecule.

[12] The emulsifiable concentrate according to [11], wherein the nonionic surfactant which has polyalkylene oxide structure in the molecule is the surfactant selected from the group consisting of polyoxyethylene-polyoxypropylene tristyryl phenyl ether, polyoxyethylene tristyryl phenyl ether and polyoxyethylene castor oil.

[13] The emulsifiable concentrate according to [9] or [10], wherein the nonionic surfactant is a sorbitan fatty acid ester.

[14] The emulsifiable concentrate according to [1], wherein the emulsifiable concentrate comprises

4-cyano-2,6-dibromophenyl octanoate and 4-cyano-2,6-diiodophenyl octanoate.

[15] The emulsifiable concentrate according to [2], wherein the emulsifiable concentrate comprises 1 to 30 % by weight of 4-cyano-2,6-dibromophenyl octanoate and 1 to 30 % by weight of 4-cyano-2,6-diiodophenyl octanoate.

[16] The emulsifiable concentrate according to [14] or [15], wherein the ratio of the compound shown by the formula (1) is 5 to 80 by weight for the weight of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide.

2006200731 22 Feb 2006

- [17] The emulsifiable concentrate according to any one of [14] to [16], wherein the surfactant is an anionic surfactant and a nonionic surfactant; and the ratio by weight of the anionic surfactant and the nonionic surfactant is 1:0.1 to 1:10.
- 5 [18] The emulsifiable concentrate according to any one of [11] to [14], wherein the compound shown by the formula (1) is diethyl oxalate.
- [19] The emulsifiable concentrate according to any one of [14] to [18], wherein the emulsifiable concentrate comprises
- 10 an aromatic hydrocarbon.
- [20] The emulsifiable concentrate, which is characterized by comprising
- 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinanilide;
- 1,3-dimethyl-2-imidazolidinone;
- 15 an aromatic hydrocarbon; and
- a surfactant.
- [21] The emulsifiable concentrate, which is characterized by comprising
- 1 to 5 % by weight of
- 20 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinanilide;
- 5 to 60 % by weight of 1,3-dimethyl-2-imidazolidinone;
- 10 to 50 % by weight of an aromatic hydrocarbon; and
- 4 to 20 % by weight of a surfactant.
- [22] The emulsifiable concentrate, which is
- 25 characterized by comprising
- 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinanilide;
- a sorbitan fatty acid ester;
- an anionic surfactant; and
- an aromatic hydrocarbon.

2006200731 22 Feb 2006

[23] The emulsifiable concentrate, which is characterized by comprising 0.5 to 5 % by weight of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide;
 5 0.5 to 10 % by weight of a sorbitan fatty acid ester; 0.5 to 10 % by weight of an anionic surfactant; and 10 to 90 % by weight of an aromatic hydrocarbon.

[24] An aqueous composition which is obtainable by diluting the emulsifiable concentrate according to any one of
 10 [1] to [23] with water.

The emulsifiable concentrate of the present invention contains

2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide
 15 as a herbicidal active ingredient. The common name of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide is diflufenican(referred as diflufenican, hereinafter).

The emulsifiable concentrate of the present invention may
 20 further contain another herbicidal active compound such as 4-cyano-2,6-dibromophenyl octanoate and 4-cyano-2,6-diiodophenyl octanoate. 4-cyano-2,6-dibromophenyl octanoate is the compound named bromoxynil octanoate as common name(referred as
 25 bromoxynil=octanoate, hereinafter). 4-cyano-2,6-diiodophenyl octanoate is the compound named ioxynil octanoate as common name(referred as ioxynil=octanoate, hereinafter).

Diflufenican is the compound disclosed in "The Pesticide

2006200731 22 Feb 2006

Manual" (by British Crop Protection Council, Thirteenth Edition) as reference number 251. It is a solid compound and its melting point is about 159 to 161 °C. It can be produced by the method disclosed in USP-4618366. Bromoxynil-octanoate is the compound disclosed in "The Pesticide Manual" (mentioned above) as reference number 95. It is a solid compound and its melting point is about 45 to 46 °C. It can be produced by the method disclosed in USP-3397054. Ioxynil-octanoate is the compound disclosed in "The Pesticide Manual" (mentioned above) as reference number 467. It is a solid compound and its melting point is about 56 to 57 °C. It can be produced by the method disclosed in USP-3397054.

In the emulsifiable concentrate of the present invention, the amount of diflufenican is usually 0.5 to 5 % by weight, preferably 1 to 5 % by weight, more preferably 1 to 4 % by weight and far more preferably 1.5 to 4 % by weight based on the total weight of the emulsifiable concentrate of the present invention.

In case of the emulsifiable concentrate of the present invention contains bromoxynil-octanoate and/or ioxynil-octanoate, the amount of bromoxynil-octanoate is usually 1 to 30 % by weight, preferably 6 to 20 % by weight and more preferably 8 to 18 % by weight; and the amount of ioxynil-octanoate is usually 1 to 30 % by weight, preferably 4 to 12 % by weight and more preferably 4 to 10 % by weight based on the total weight of the emulsifiable concentrate of the present invention. In this case, the total weight of diflufenican, bromoxynil-octanoate and ioxynil-octanoate is usually 1 to 60 % by weight, preferably 3 to 40 % by weight based on the total weight of the emulsifiable concentrate of the present invention.

2006200731 22 Feb 2006

The emulsifiable concentrate of the present invention contains the compound shown by the formula (1) as a solvent. The compound shown by the formula (1) can solve diflufenican.

5 Furthermore, the compound shown by the formula (1) (referred as the present solvent, hereinafter) is miscible with an organic solvent which is usually used for pesticidal formulation.

10 In the formula (1), A represents a single bond or an alkylene group, and examples of alkylene group include methylene group, ethylene group, propylene group and trimethylene group. In the formula (1), each of R¹ and R² independently represents alkyl group, and examples of alkyl group include methyl group, ethyl group, isopropyl group, butyl group. The sum of the number of carbon atoms which consist of the group of R¹, R² and A in the
15 formula (1) is 2 to 8, preferably 2 to 5.

Examples of the present solvent include diethyl oxalate, dipropyl oxalate, dimethyl malonate, dipropyl malonate, dimethyl succinate, diethyl succinate. The present solvent can be used
20 for the emulsifiable concentrate of the present invention by itself or mixture of above mentioned compound. For the emulsifiable concentrate of the present invention, diethyl oxalate is preferably used.

The amount of the present solvent to be used for the emulsifiable concentrate of the present invention is usually 5
25 to 80 % by weight, preferably 20 to 80 % by weight and more preferably 20 to 70 % by weight based on the total weight of the emulsifiable concentrate of the present invention. And the amount of the present solvent to be used for the emulsifiable concentrate of the present invention) is usually 5 to 80 by weight, preferably

2006200731 22 Feb 2006

8 to 80 by weight and more preferably 8 to 30 by weight based on the weight of diflufenican.

The emulsifiable concentrate of the present invention may
5 contain another organic solvent.

Examples of another organic solvent includes aromatic hydrocarbons such as alkylbenzene(for example, xylene, tetramethylbenzene and the like), alkylnaphthalene(for example, methylnaphthalene), diphenylethane, dixylylethane,
10 phenylxylylethane and the like; fatty acid monoesters such as methyl laurate, isopropylmyristate, isopropyl palmitate, methyl caprate, methyl oleate, isobutyl oleate, butyl propionate, isoamyl propionate, ethyl butyrate, butyl butyrate, isoamyl butyrate, isoamyl valerate, amyl lactate, methyl linoleate,
15 methyl linolenate, palm fatty acid methyl and the like; aliphatic hydrocarbons such as cyclohexane; N,N-dimethyl acetamide; N-methyl-2-pyrrolidone and 1,3-dimethyl-2-imidazolidinone.

Commercially available products such as Hisol SAS-296 (commercial name of Nippon Oil Corp., a mixture of
20 1-phenyl-1-xylylethane and 1-phenyl-1-ethylphenylethane), Cactus Solvent HP-MN (commercial name of Nikko Petrochemical Company, containing 80% of methylnaphthalene), Cactus Solvent HP-DMN (commercial name of Nikko Petrochemical Company, containing 80% of dimethylnaphthalene), Cactus Solvent P-100
25 (commercial name of Nikko Petrochemical Company, alkylbenzene having 9 to 10 carbon atoms), Cactus Solvent P-150 (commercial name of Nikko Petrochemical Company, alkylbenzene), Cactus Solvent P-180 (commercial name of Nikko Petrochemical Company, a mixture of methylnaphthalene and dimethylnaphthalene), Cactus

2006200731 22 Feb 2006

- Solvent P-200 (commercial name of Nikko Petrochemical Company, a mixture of methylnaphthalene and dimethylnaphthalene), Cactus Solvent P-220 (commercial name of Nikko Petrochemical Company, a mixture of methylnaphthalene and dimethylnaphthalene), Cactus
- 5 Solvent PAD-1 (commercial name of Nikko Petrochemical Company, dimethylmonoisopropylnaphthalene), Solvesso 100 (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C9 to C10 dialkyl and trialkyl benzene), Solvesso 150 (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly
- 10 C10 to C11 alkylbenzene), Solvesso 150 ND (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C10 to C11 alkylbenzene), Solvesso 200 (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C10 to C14 alkyl naphthalene), ULTRA LOW NAPHTHALENE AROMATIC 150
- 15 (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C10 to C11 alkylbenzene), ULTRA LOW NAPHTHALENE AROMATIC 200 (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C11 to C14
- 20 alkyl naphthalene), Solvesso 200 ND (commercial name of Exxon Mobil Chemical Company, aromatic hydrocarbon, mainly C11 to C14 alkyl naphthalene), Suwasol 100 (commercial name of Maruzen Petrochemical Company, toluene) and Suwasol 200 (commercial name of Maruzen Petrochemical Company, xylene) can be used as the aromatic hydrocarbons.

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In the emulsifiable concentrate of the present invention, it is preferable that an aromatic hydrocarbon and/or N-methyl-2-pyrrolidone and/or 1,3-dimethyl-2-imidazolidinone are contained.

2006200731 22 Feb 2006

In case of the emulsifiable concentrate of the present invention includes an aromatic hydrocarbon, the amount of the aromatic hydrocarbon is usually 1 to 40 % by weight based on the total weight of the emulsifiable concentrate of the present invention.

In case of the emulsifiable concentrate of the present invention includes N-methyl-2-pyrrolidone, the amount of N-methyl-2-pyrrolidone is usually 3 to 30 % by weight based on the total weight of the emulsifiable concentrate of the present invention.

In case of the emulsifiable concentrate of the present invention includes 1,3-dimethyl-2-imidazolidinone, the amount of 1,3-dimethyl-2-imidazolidinone is usually 5 to 80 % by weight, preferably 5 to 60 % by weight, more preferably 5 to 50 % by weight, far more preferably 10 to 50 % by weight based on the total weight of the emulsifiable concentrate of the present invention.

The emulsifiable concentrate of the present invention contains a surfactant. The surfactant used for the emulsifiable concentrate of the present invention is preferably a mixture of an anionic surfactant and a nonionic surfactant.

Examples of anionic surfactant include alkyl aryl sulfonic acid salt such as dodecyl benzene sulfonic acid salt and the like, polyoxyethylene(poly)arylaryl ether sulfates such as polyoxyethylene distyryl phenyl ether sulfate and the like, polyoxyethylene(poly)arylaryl ether phosphate such as polyoxyethylene tristyryl phenyl ether phosphate and the like, polyoxyethylenealkylaryl phosphate ester, and

2006200731 22 Feb 2006

polyoxyethylenealkyl phosphate ester.

Preferably alkyl aryl sulfonic acid salt such as alkyl benzene sulfonic acid salt, especially dodecyl benzene sulfonic acid salt such as sodium salt and calcium salt is used.

5 Generally, sodium salt, calcium salt and ammonium salt are exemplified as sulfonic acid salt, sulfate salt or phosphate salt.

Commercially available surfactant such as Rhodacal 70, Rhodacal70/B, Rhodacal60/BE(each produced by Rhodia Nicca),
 10 Witconate P-1220EH(produced by Akzo Nobel) and NANSA EVM62/H(produced by Huntsman) can be used as dodecyl benzene sulfonic acid salt. Commercially available surfactant such as Soprophor DSS/11(produced by Rhodia Nicca) can be used as polyoxyethylene distyryl phenyl ether sulfate. Commercially
 15 available surfactant such as Soprophor FLK(produced by Rhodia Nicca) can be used as polyoxyethylene tristyryl phenyl ether phosphoric acid. Commercially available surfactant such as Rhodafac PS/17(produced by Rhodia Nicca) can be used as polyoxyethylenealkylaryl phosphate ester. Commercially
 20 available surfactant such as Rhodafac MB(produced by Rhodia Nicca) can be used as polyoxyethylenealkyl phosphate ester.

Examples of nonionic surfactant include

polyoxyethylene-polyoxypropylene block polymer;
 fatty acid ester of polyoxyethylene-polyoxypropylene block
 25 polymer;

polyoxyethylene-polyoxypropylene alkyl ether;
 polyoxyethylene-polyoxypropylene polyaryl ether such as
 polyoxyethylene-polyoxypropylene tristyryl phenyl ether,
 polyoxyethylene-polyoxypropylene distyryl phenyl ether and the

2006200731 22 Feb 2006

- like;
- polyoxyethylene-polyoxypropylene alkyl aryl ether;
- polyoxyethylene alkyl aryl ether;
- polyoxyethylene polyaryl ether such as polyoxyethylene tristyryl
- 5 phenyl ether, polyoxyethylene distyryl phenyl ether and the like;
- polyoxyethylene vegetable oil such as polyoxyethylene castor oil
- and the like;
- polyoxyethylene hardened vegetable oil such as polyoxyethylene
- hardened castor oil and the like;
- 10 polyoxyethylene-polyoxypropylene vegetable oil such as
- polyoxyethylene-polyoxypropylene castor oil and the like;
- polyoxyethylene fatty acid esters;
- polyoxyethylene alkyl ether;
- polyoxyethylene tristyryl phenyl phosphate diester;
- 15 polyoxyethylene-polyoxypropylene tristyryl phenyl phosphate
- diester;
- polyalkyleneoxide block copolymer;
- butyl polyalkyleneoxide block copolymer;
- fatty acid alcohol polyglycol ether;
- 20 fatty acid ester of glycerin; and
- sorbitan fatty acid ester.

Preferable examples of the nonionic surfactants to be used

for the emulsifiable concentrate of the present invention are

the nonionic surfactant which has polyalkylene oxide structure

25 in the molecule and sorbitan fatty acid ester.

Examples of the nonionic surfactant which has polyalkylene

oxide structure in the molecule are as

polyoxyethylene-polyoxypropylene tristyryl phenyl ether,

polyoxyethylene tristyryl phenyl ether,

22 Feb 2006

2006200731

polyoxyethylene castor oil,
 polyoxyethylene hardened castor oil,
 polyoxyethylene alkyl aryl ether,
 polyoxyethylene tristyril phenyl phosphate diester or
 5 polyoxyethylene-polyoxypropylene tristyril phenyl phosphate
 diester.

In the nonionic surfactant which has polyalkylene oxide
 structure in the molecule, especially
 polyoxyethylene-polyoxypropylene tristyril phenyl ether,
 10 polyoxypropylene tristyril phenyl ether, polyalkyleneoxide
 block copolymer, butyl polyalkyleneoxide block copolymer or
 polyoxyethylenecastoroilispreferablyusedfortheemulsifiable
 concentrate of the present invention.

The HLB value of the nonionic surfactant which has
 15 polyalkylene oxide in the molecule is usually 10 to 17, preferably
 10 to 14, more preferably 11 to 12.

Commercially available surfactant such as Teric PE
 64(produced by Huntsman) can be used as
 polyoxyethylene-polyoxypropylene block polymer. Commercially
 20 available surfactant such as Antarox BO/327, 340 Antarox BO
 series(each produced by Rhodia Nicca) can be used as
 polyoxyethylene-polyoxypropylene alkyl ether. Commercially
 available surfactant such as Solpol T26(produced by Toho Chemical
 Industry) can be used as polyoxyethylene alkyl aryl ether.
 25 Commercially available surfactant such as Soprophor 796/P(HLB
 13.7, produced by Rhodia Nicca) can be used as
 polyoxyethylene-polyoxypropylene tristyril phenyl ether.
 Commercially available surfactant such as Soprophor BSU(HLB 12.6,
 produced by Rhodia Nicca) can be used as polyoxyethylene tristyril

22 Feb 2006

2006200731

phenyl ether. Commercially available surfactant such as Alkamuls OR40, Alkamuls BR(each produced by Rhodia Nicca) can be used as polyoxyethylene castor oil. Commercially available surfactant such as HCO-20(produced by Nikko Chemicals) can be used as polyoxyethylene hardened castor oil. Commercially available surfactant such as CR series such as Antarox CR/255, CR/405 and the like(each produced by Rhodia Nicca) can be used as polyoxyethylene-polyoxypropylene castor oil. Commercially available surfactant such as Newcol 150(produced by Nippon Nyukazai) can be used as polyoxyethylene fatty acid ester. Commercially available surfactant such as Newcol 1100, Newcol 1105(each produced by Nippon Nyukazai) can be used as polyoxyethylene alkyl aryl ester. Commercially available surfactant such as PIONIN D-900 series(produced by TAKEMOTO Oil & Fat) can be used as fatty acid ester of glycerin. Commercially available surfactant such as Toximul 8320(produced by Stepan) can be used as butyl polyalkyleneoxide block copolymer. Commercially available surfactant such as Toximul 8323(produced by Stepan), Step-Flow 26(produced by Stepan) and Ethylan NS 500 LQ(produced by Akzo Nobel) can be used as polyalkyleneoxide block copolymer.

Sorbitan fatty acid esters are an ester compound which is condensed by sorbitan and fatty acid. Sorbitan is an intramolecular dehydration product of sorbitol. There are several kinds of sorbitan fatty acid ester such as sorbitan mono fatty acid ester, sorbitan tri fatty acid ester and the like depending on the number of condensed fatty acid. There are several kinds of sorbitans such as 1,4-sorbitan, 1,5-sorbitan and the like, depending on the dehydrating position of intramolecular

2006200731 22 Feb 2006

dehydration of sorbitol. As fatty acids condensed with sorbitan, fatty acids which the number of carbon atoms is 10 to 22 are usually used. Concretely, saturated fatty acids such as capric acid, lauric acid, myristic acid, pentadecanoic acid, palmitic acid, stearic acid and the like, and unsaturated fatty acids such as oleic acid, linoleic acid, linolenic acid and the like are exemplified.

Sorbitan fatty acid esters concretely include, for example, sorbitan mono laurate, sorbitan mono palmitate, sorbitan mono stearate, sorbitan mono oleate and the like.

Commercially available surfactant such as Alkamuls S20(sorbitan mono laurate, HLB 8.6, produced by Rhodia Nicca), Alkamuls S80(sorbitan mono oleate, HLB 4.3, produced by Rhodia Nicca), Glycomul S(sorbitan mono stearate, HLB 5, produced by Lonza Japan), Glycomul TS(sorbitan tri stearate, HLB 2, produced by Lonza Japan), NIKKOL SL-10(sorbitan mono laurate, HLB 8.6, produced by Nikko Chemicals), NIKKOL SP-10V(sorbitan mono palmitate, HLB 6.7, produced by Nikko Chemicals), NIKKOL SS-10V(sorbitan mono stearate, HLB 4.7, produced by Nikko Chemicals), NIKKOL SS-30V(sorbitan tri stearate, HLB 2.1, produced by Nikko Chemicals), NIKKOL SI-10RV(sorbitan mono isostearate, HLB 5.0, produced by Nikko Chemicals), NIKKOL SO-15R(sorbitan sesquioleate and HLB 4.5, produced by Nikko Chemicals) can be used for the emulsifiable concentrate of the present invention.

In case of the emulsifiable concentrate of the present invention includes sorbitan fatty acid ester, the amount of the sorbitan fatty acid ester is usually 0.5 to 10 % by weight, preferably 1 to 8 % by weight based on the total of the emulsifiable

2006200731 22 Feb 2006

concentrate of the present invention. And in this case, the amount of the sorbitan fatty acid ester is preferably 0.2 to 2.5 times by weight based on the weight of diflufenican. In the view point of stability while keeping in low temperature, it is preferable

5 that the emulsifiable concentrate of the present invention includes sorbitan fatty acid ester as a nonionic surfactant. The stability while keeping in low temperature means having a character of producing little oil like separation or solid while keeping in low temperature such as below 5 °C.

10 The nonionic surfactant used for the emulsifiable concentrate of the present invention may be consisted of one kind of nonionic surfactant or may be consisted of at least two kinds of nonionic surfactants. In case of the nonionic surfactant used for the emulsifiable concentrate of the present invention is

15 consisted of at least two kinds of nonionic surfactants, the combination of the nonionic surfactants includes, for example, the combination of the nonionic surfactant which has polyalkylene oxide structure in the molecule and sorbitan fatty acid ester, more concretely the combination of polyoxyethylene tristyryl

20 phenyl ether and sorbitan fatty acid ester.

In the emulsifiable concentrate of the present invention, the amount of surfactant is usually 4 to 20 % by weight, preferably 4 to 15 % by weight based on the total weight of the emulsifiable concentrate of the present invention. In case of the surfactant

25 used for the emulsifiable concentrate of the present invention is a mixture of an anionic surfactant and a nonionic surfactant, the weight ratio of the anionic surfactant and the nonionic surfactant is usually 1:0.1 to 1:10, preferably 1:0.4 to 1:2.5.

22 Feb 2006

2006200731

The emulsifiable concentrate of the present invention may further include an additive.

Examples of the additive include antioxidant such as 3-/2-t-butyl-4-hydroxyanisole, butyl hydroxy toluene and the like; coloring agent and the like.

The mode of the emulsifiable concentrate of the present invention includes as following:

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;
- 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
- 5 to 20 % by weight of an aromatic hydrocarbon; and
- 5 to 70 % by weight of the compound shown by the formula (1).

15

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;
- 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene oxide structure in the molecule;
- 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
- 5 to 20 % by weight of an aromatic hydrocarbon; and
- 5 to 70 % by weight of the compound shown by the formula (1).

20

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;
- 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
- 3 to 30 % by weight of N-methyl-2-pyrrolidone;

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2006200731 22 Feb 2006

5 to 20 % by weight of an aromatic hydrocarbon; and
5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 5 0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
0.5 to 15 % by weight of an anionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
10 3 to 30 % by weight of N-methyl-2-pyrrolidone;
5 to 20 % by weight of an aromatic hydrocarbon; and
5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 15 0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of N,N-dimethylacetamide;
5 to 20 % by weight of an aromatic hydrocarbon; and
20 5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
25 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of N,N-dimethylacetamide;
5 to 20 % by weight of an aromatic hydrocarbon; and

2006200731 22 Feb 2006

5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

5 0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;

5 to 20 % by weight of an aromatic hydrocarbon; and

5 to 70 % by weight of diethyl oxalate.

10

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 15 % by weight of an anionic surfactant which has polyalkylene

15 oxide structure in the molecule;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;

5 to 20 % by weight of an aromatic hydrocarbon; and

5 to 70 % by weight of diethyl oxalate.

20

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

25 3 to 30 % by weight of N-methyl-2-pyrrolidone;

5 to 20 % by weight of an aromatic hydrocarbon; and

5 to 70 % by weight of diethyl oxalate; and

the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5; and

22 Feb 2006

2006200731

and the ratio by weight of N-methyl-2-pyrrolidone and diethyl oxalate is 1 : 0.1 to 1 : 1.

An emulsifiable concentrate, which comprises

5 0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of N,N-dimethylacetamide;

5 to 20 % by weight of an aromatic hydrocarbon; and

10 5 to 70 % by weight of diethyl oxalate; and

the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5; and

and the ratio by weight of N,N-dimethylacetamide and diethyl oxalate is 1 : 0.1 to 1 : 1.

15

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester; .

0.5 to 15 % by weight of an anionic surfactant which has polyalkylene

20 oxide structure in the molecule;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of N,N-dimethylacetamide;

5 to 20 % by weight of an aromatic hydrocarbon; and

5 to 70 % by weight of diethyl oxalate; and

25 the ratio by weight of diflufenican and the sorbitan fatty acid

ester is 1 : 0.2 to 1 : 1.5; and

and the ratio by weight of N,N-dimethylacetamide and diethyl oxalate is 1 : 0.1 to 1 : 1.

2006200731 22 Feb 2006

- An emulsifiable concentrate, which comprises
- 0.5 to 5 % by weight of diflufenican;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 - 5 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
 - 5 to 20 % by weight of an aromatic hydrocarbon; and
 - 5 to 70 % by weight of diethyl oxalate; and
 - the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5; and
 - 10 and the ratio by weight of 1,3-dimethyl-2-imidazolidinone and sum of an aromatic hydrocarbon and diethyl oxalate is 1 : 0.1 to 1 : 1.

- An emulsifiable concentrate, which comprises
- 15 0.5 to 5 % by weight of diflufenican;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene oxide structure in the molecule;
 - 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 - 20 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
 - 5 to 20 % by weight of an aromatic hydrocarbon; and
 - 5 to 70 % by weight of diethyl oxalate; and
 - the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5; and
 - 25 and the ratio by weight of the 1,3-dimethyl-2-imidazolidinone and sum of an aromatic hydrocarbon and diethyl oxalate is 1 : 0.1 to 1 : 1.

An emulsifiable concentrate, which comprises

22 Feb 2006

2006200731

- 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 5 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate, which comprises
 10 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene
 15 oxide structure in the molecule;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of the compound shown by the formula (1).

- 20 An emulsifiable concentrate, which comprises
 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 25 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate.

22 Feb 2006

2006200731

- An emulsifiable concentrate, which comprises
- 0.5 to 5 % by weight of diflufenican;
 - 1 to 30 % by weight of bromoxynil=octanoate;
 - 1 to 30 % by weight of ioxynil=octanoate;
 - 5 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene oxide structure in the molecule;
 - 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 - 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 - 10 5 to 20 % by weight of an aromatic hydrocarbon; and
 - 5 to 70 % by weight of diethyl oxalate.

- An emulsifiable concentrate, which comprises
- 0.5 to 5 % by weight of diflufenican;
 - 15 1 to 30 % by weight of bromoxynil=octanoate;
 - 1 to 30 % by weight of ioxynil=octanoate;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 - 3 to 30 % by weight of N,N-dimethylacetamide;
 - 20 5 to 20 % by weight of an aromatic hydrocarbon; and
 - 5 to 70 % by weight of diethyl oxalate.

- An emulsifiable concentrate, which comprises
- 0.5 to 5 % by weight of diflufenican;
 - 25 1 to 30 % by weight of bromoxynil=octanoate;
 - 1 to 30 % by weight of ioxynil=octanoate;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene oxide structure in the molecule;

22 Feb 2006

2006200731

- 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of N,N-dimethylacetamide;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate.

5

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;

- 10 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate.

15

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;

- 20 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 15 % by weight of a nonionic surfactant which has polyalkylene
 oxide structure in the molecule;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
 25 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;

2006200731 22 Feb 2006

- 1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 5 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate; and
 the ratio by weight of diflufenican and the sorbitan fatty acid
 ester is 1 : 0.2 to 1 : 1.5; and
 10 and the ratio by weight of N-methyl-2-pyrrolidone and diethyl
 oxalate is 1 : 0.1 to 1 : 1.

- An emulsifiable concentrate, which comprises
 0.5 to 5 % by weight of diflufenican;
 15 1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of N,N-dimethylacetamide;
 20 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate; and
 the ratio by weight of diflufenican and the sorbitan fatty acid
 ester is 1 : 0.2 to 1 : 1.5; and
 and the ratio by weight of N,N-dimethylacetamide and diethyl
 25 oxalate is 1 : 0.1 to 1 : 1.

An emulsifiable concentrate, which comprises
 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil=octanoate;

22 Feb 2006

2006200731

- 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
 5 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate; and
 the ratio by weight of diflufenican and the sorbitan fatty acid
 ester is 1 : 0.2 to 1 : 1.5; and
 and the ratio by weight of 1,3-dimethyl-2-imidazolidinone and
 10 sum of an aromatic hydrocarbon and diethyl oxalate is 1 : 0.1
 to 1 : 1.

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
 15 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt; and
 10 to 90 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 20 0.5 to 5 % by weight of diflufenican;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 0.5 to 15 % by weight of a nonionic surfactant which has polyalkylene
 oxide structure in the molecule;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt; and
 25 10 to 90 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

- 0.5 to 5 % by weight of diflufenican;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;

2006200731 22 Feb 2006

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone; and
10 to 90 % by weight of diethyl oxalate.

5 An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
0.5 to 15 % by weight of an anionic surfactant which has polyalkylene
oxide structure in the molecule;

10 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone; and
10 to 90 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

15 0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
5 to 20 % by weight of an aromatic hydrocarbon; and
20 5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
25 0.5 to 15 % by weight of an anionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;
5 to 20 % by weight of an aromatic hydrocarbon; and

2006200731 22 Feb 2006

5 to 70 % by weight of diethyl oxalate.

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

5 0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt; and

10 to 90 % by weight of diethyl oxalate and

the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5.

10 An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 15 % by weight of an anionic surfactant which has polyalkylene oxide structure in the molecule;

15 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt; and

10 to 90 % by weight of diethyl oxalate and

the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5.

20 An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

25 3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone; and

10 to 90 % by weight of diethyl oxalate; and

the ratio by weight of diflufenican and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5.

22 Feb 2006

2006200731

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 15 % by weight of an anionic surfactant which has polyalkylene

5 oxide structure in the molecule;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone; and

10 to 90 % by weight of diethyl oxalate; and

the ratio by weight of diflufenican and the sorbitan fatty acid

10 ester is 1 : 0.2 to 1 : 1.5.

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

0.5 to 10 % by weight of a sorbitan fatty acid ester;

15 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;

5 to 20 % by weight of an aromatic hydrocarbon; and

5 to 70 % by weight of diethyl oxalate; and

the ratio by weight of diflufenican and the sorbitan fatty acid

20 ester is 1 : 0.2 to 1 : 1.5, and the ratio by weight of diflufenican

and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5.

An emulsifiable concentrate, which comprises

0.5 to 5 % by weight of diflufenican;

25 0.5 to 10 % by weight of a sorbitan fatty acid ester;

0.5 to 15 % by weight of an anionic surfactant which has polyalkylene

oxide structure in the molecule;

0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;

3 to 30 % by weight of 1,3-dimethyl-2-imidazolidinone;

22 Feb 2006

2006200731

- 5 to 20 % by weight of an aromatic hydrocarbon; and
 5 to 70 % by weight of diethyl oxalate; and
 the ratio by weight of diflufenican and the sorbitan fatty acid
 ester is 1 : 0.2 to 1 : 1.5, and the ratio by weight of diflufenican
 5 and the sorbitan fatty acid ester is 1 : 0.2 to 1 : 1.5.

- An emulsifiable concentrate comprising
 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil=octanoate;
 10 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of an anionic surfactant;
 0.5 to 10 % by weight of a nonionic surfactant;
 1 to 40 % by weight of an aromatic hydrocarbon;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 15 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 5 to 80 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate comprising
 2 to 5 % by weight of diflufenican;
 20 15 to 20 % by weight of bromoxynil=octanoate;
 12 to 18 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of an anionic surfactant;
 1 to 5 % by weight of a nonionic surfactant;
 1 to 10 % by weight of an aromatic hydrocarbon;
 25 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 50 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

2006200731 22 Feb 2006

- 0.5 to 5 % by weight of diflufenican;
- 1 to 30 % by weight of bromoxynil=octanoate;
- 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of an anionic surfactant;
- 5 0.5 to 10 % by weight of a nonionic surfactant;
- 1 to 40 % by weight of an aromatic hydrocarbon;
- 3 to 30 % by weight of N-methyl-2-pyrrolidone;
- 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
- 5 to 80 % by weight of the compound shown by the formula (1).

10

An emulsifiable concentrate essentially consisting of

- 2 to 5 % by weight of diflufenican;
- 15 to 20 % by weight of bromoxynil=octanoate;
- 12 to 18 % by weight of ioxynil=octanoate;
- 15 1 to 5 % by weight of an anionic surfactant;
- 1 to 5 % by weight of a nonionic surfactant;
- 1 to 10 % by weight of an aromatic hydrocarbon;
- 2 to 8 % by weight of N-methyl-2-pyrrolidone;
- 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
- 20 50 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

- 2 to 5 % by weight of diflufenican;
- 15 to 20 % by weight of bromoxynil=octanoate;
- 25 12 to 18 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of an anionic surfactant;
- 1 to 5 % by weight of a nonionic surfactant;
- 1 to 10 % by weight of an aromatic hydrocarbon;
- 2 to 8 % by weight of N-methyl-2-pyrrolidone;

2006200731 22 Feb 2006

10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
rest of the compound shown by the formula (1).

An emulsifiable concentrate comprising

- 5 0.5 to 5 % by weight of diflufenican;
- 1 to 30 % by weight of bromoxynil=octanoate;
- 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
- 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene
- 10 oxide structure in the molecule;
- 1 to 40 % by weight of an aromatic hydrocarbon;
- 3 to 30 % by weight of N-methyl-2-pyrrolidone;
- 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
- 5 to 80 % by weight of the compound shown by the formula (1).

15

An emulsifiable concentrate comprising

- 2 to 5 % by weight of diflufenican;
- 15 to 20 % by weight of bromoxynil=octanoate;
- 12 to 18 % by weight of ioxynil=octanoate;
- 20 1 to 5 % by weight of an alkylbenzenesulfonic acid salt;
- 1 to 5 % by weight of a nonionic surfactant which has polyalkylene
- oxide structure in the molecule;
- 1 to 10 % by weight of an aromatic hydrocarbon;
- 2 to 8 % by weight of N-methyl-2-pyrrolidone;
- 25 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
- 50 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

0.5 to 5 % by weight of diflufenican;

22 Feb 2006

2006200731

1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of an alkylbenzenesulfonic acid salt;
 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene
 5 oxide structure in the molecule;

1 to 40 % by weight of an aromatic hydrocarbon;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 5 to 80 % by weight of the compound shown by the formula (1).

10

An emulsifiable concentrate essentially consisting of

2 to 5 % by weight of diflufenican;

15 15 to 20 % by weight of bromoxynil=octanoate;

12 to 18 % by weight of ioxynil=octanoate;

15 1 to 5 % by weight of an alkylbenzenesulfonic acid salt;

1 to 5 % by weight of a nonionic surfactant which has polyalkylene
 oxide structure in the molecule;

1 to 10 % by weight of an aromatic hydrocarbon;

2 to 8 % by weight of N-methyl-2-pyrrolidone;

20 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and

50 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

2 to 5 % by weight of diflufenican;

25 15 to 20 % by weight of bromoxynil=octanoate;

12 to 18 % by weight of ioxynil=octanoate;

1 to 5 % by weight of an alkylbenzenesulfonic acid salt;

1 to 5 % by weight of a nonionic surfactant which has polyalkylene
 oxide structure in the molecule;

22 Feb 2006

2006200731

1 to 10 % by weight of an aromatic hydrocarbon;
 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 rest of the compound shown by the formula (1).

5

An emulsifiable concentrate comprising
 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil-octanoate;
 1 to 30 % by weight of ioxynil-octanoate;
 10 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyalkyleneoxide block copolymer;
 1 to 40 % by weight of an aromatic hydrocarbon;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 15 5 to 80 % by weight of diethyl oxalate.

An emulsifiable concentrate comprising
 2 to 5 % by weight of diflufenican;
 15 to 20 % by weight of bromoxynil-octanoate;
 20 12 to 18 % by weight of ioxynil-octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 1 to 5 % by weight of polyalkyleneoxide block copolymer;
 1 to 10 % by weight of an aromatic hydrocarbon;
 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 25 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 50 to 80 % by weight of diethyl oxalate.

An emulsifiable concentrate essentially consisting of
 0.5 to 5 % by weight of diflufenican;

2006200731 22 Feb 2006

- 1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyalkyleneoxide block copolymer;
- 5 1 to 40 % by weight of an aromatic hydrocarbon;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 5 to 80 % by weight of diethyl oxalate.
- 10 An emulsifiable concentrate essentially consisting of
 2 to 5 % by weight of diflufenican;
 15 to 20 % by weight of bromoxynil=octanoate;
 12 to 18 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
- 15 1 to 5 % by weight of polyalkyleneoxide block copolymer;
 1 to 10 % by weight of an aromatic hydrocarbon;
 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 50 to 80 % by weight of diethyl oxalate.
- 20 An emulsifiable concentrate essentially consisting of
 2 to 5 % by weight of diflufenican;
 15 to 20 % by weight of bromoxynil=octanoate;
 12 to 18 % by weight of ioxynil=octanoate;
- 25 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 1 to 5 % by weight of polyalkyleneoxide block copolymer;
 1 to 10 % by weight of an aromatic hydrocarbon;
 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and

2006200731 22 Feb 2006

rest of diethyl oxalate.

An emulsifiable concentrate comprising

0.5 to 5 % by weight of diflufenican;

5 1 to 30 % by weight of bromoxynil=octanoate;

1 to 30 % by weight of ioxynil=octanoate;

0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;

0.5 to 10 % by weight of butylpolyalkyleneoxide block copolymer;

1 to 40 % by weight of an aromatic hydrocarbon;

10 3 to 30 % by weight of N-methyl-2-pyrrolidone;

5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and

5 to 80 % by weight of diethyl oxalate.

An emulsifiable concentrate comprising

15 2 to 5 % by weight of diflufenican;

15 to 20 % by weight of bromoxynil=octanoate;

12 to 18 % by weight of ioxynil=octanoate;

1 to 5 % by weight of calcium dodecyl benzene sulfonate;

1 to 5 % by weight of butylpolyalkyleneoxide block copolymer;

20 1 to 10 % by weight of an aromatic hydrocarbon;

2 to 8 % by weight of N-methyl-2-pyrrolidone;

10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and

50 to 80 % by weight of diethyl oxalate.

25 An emulsifiable concentrate essentially consisting of

0.5 to 5 % by weight of diflufenican;

1 to 30 % by weight of bromoxynil=octanoate;

1 to 30 % by weight of ioxynil=octanoate;

0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;

22 Feb 2006

2006200731

- 0.5 to 10 % by weight of butylpolyalkyleneoxide block copolymer;
 1 to 40 % by weight of an aromatic hydrocarbon;
 3 to 30 % by weight of N-methyl-2-pyrrolidone;
 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 5 5 to 80 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
 2 to 5 % by weight of diflufenican;
 15 to 20 % by weight of bromoxynil=octanoate;
 10 12 to 18 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 1 to 5 % by weight of butylpolyalkyleneoxide block copolymer;
 1 to 10 % by weight of an aromatic hydrocarbon;
 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 15 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 50 to 80 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
 3 to 5 % by weight of diflufenican;
 20 15 to 20 % by weight of bromoxynil=octanoate;
 12 to 18 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 1 to 5 % by weight of butylpolyalkyleneoxide block copolymer;
 1 to 10 % by weight of an aromatic hydrocarbon;
 25 2 to 8 % by weight of N-methyl-2-pyrrolidone;
 10 to 20 % by weight of 1,3-dimethyl-2-imidazolidinone; and
 rest of diethyl oxalate.

An emulsifiable concentrate comprising

2006200731 22 Feb 2006

- 0.5 to 5 % by weight of diflufenican;
- 1 to 30 % by weight of bromoxynil=octanoate;
- 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of an anionic surfactant;
- 5 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;
- 1 to 40 % by weight of an aromatic hydrocarbon; and
- 5 to 80 % by weight of the compound shown by the formula (1).

10

- An emulsifiable concentrate comprising
- 2 to 5 % by weight of diflufenican;
- 10 to 20 % by weight of bromoxynil=octanoate;
- 5 to 15 % by weight of ioxynil=octanoate;
- 15 1 to 5 % by weight of an anionic surfactant;
- 3 to 8 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 1 to 10 % by weight of an aromatic hydrocarbon; and
- 20 50 to 80 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate essentially consisting of
- 0.5 to 5 % by weight of diflufenican;
- 1 to 30 % by weight of bromoxynil=octanoate;
- 25 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of an anionic surfactant;
- 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;

2006200731 22 Feb 2006

1 to 40 % by weight of an aromatic hydrocarbon; and
5 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

- 5 2 to 5 % by weight of diflufenican;
- 10 to 20 % by weight of bromoxynil=octanoate;
- 5 to 15 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of an anionic surfactant;
- 3 to 8 % by weight of a nonionic surfactant which has polyalkylene
- 10 oxide structure in the molecule;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 1 to 10 % by weight of an aromatic hydrocarbon; and
- 50 to 80 % by weight of the compound shown by the formula (1).

- 15 An emulsifiable concentrate essentially consisting of

2 to 5 % by weight of diflufenican;
10 to 20 % by weight of bromoxynil=octanoate;
5 to 15 % by weight of ioxynil=octanoate;
1 to 5 % by weight of an anionic surfactant;
20 3 to 8 % by weight of a nonionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 3 % by weight of a sorbitan fatty acid ester;
1 to 10 % by weight of an aromatic hydrocarbon; and
rest of the compound shown by the formula (1).

- 25

An emulsifiable concentrate comprising
0.5 to 5 % by weight of diflufenican;
1 to 30 % by weight of bromoxynil=octanoate;
1 to 30 % by weight of ioxynil=octanoate;

22 Feb 2006

2006200731

- 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 1 to 40 % by weight of an aromatic hydrocarbon; and
 5 5 to 80 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate comprising
 2 to 5 % by weight of diflufenican;
 10 to 20 % by weight of bromoxynil=octanoate;
 10 5 to 15 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 0.5 to 3 % by weight of a sorbitan fatty acid ester;
 1 to 10 % by weight of an aromatic hydrocarbon; and
 15 50 to 80 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate essentially consisting of
 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil=octanoate;
 20 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 1 to 40 % by weight of an aromatic hydrocarbon; and
 25 5 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of
 2 to 5 % by weight of diflufenican;
 10 to 20 % by weight of bromoxynil=octanoate;

22 Feb 2006

2006200731

- 5 to 15 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
- 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 5 1 to 10 % by weight of an aromatic hydrocarbon; and
- 50 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

- 2 to 5 % by weight of diflufenican;
- 10 10 to 20 % by weight of bromoxynil=octanoate;
- 5 to 15 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
- 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 15 1 to 10 % by weight of an aromatic hydrocarbon; and
- rest of the compound shown by the formula (1).

An emulsifiable concentrate comprising

- 0.5 to 5 % by weight of diflufenican;
- 20 1 to 30 % by weight of bromoxynil=octanoate;
- 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
- 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
- 0.5 to 10 % by weight of sorbitan mono laurate;
- 25 1 to 40 % by weight of an aromatic hydrocarbon; and
- 5 to 80 % by weight of diethyl oxalate.

An emulsifiable concentrate comprising

- 2 to 5 % by weight of diflufenican;

22 Feb 2006

2006200731

- 10 to 20 % by weight of bromoxynil=octanoate;
 5 to 15 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 5 0.5 to 3 % by weight of sorbitan mono laurate;
 1 to 10 % by weight of an aromatic hydrocarbon; and
 50 to 80 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
 10 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 15 0.5 to 10 % by weight of sorbitan mono laurate;
 1 to 40 % by weight of an aromatic hydrocarbon; and
 5 to 80 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
 20 2 to 5 % by weight of diflufenican;
 10 to 20 % by weight of bromoxynil=octanoate;
 5 to 15 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 25 0.5 to 3 % by weight of sorbitan mono laurate;
 1 to 10 % by weight of an aromatic hydrocarbon; and
 50 to 80 % by weight of diethyl oxalate.

An emulsifiable concentrate essentially consisting of

22 Feb 2006
2006200731

- 2 to 5 % by weight of diflufenican;
10 to 20 % by weight of bromoxynil=octanoate;
5 to 15 % by weight of ioxynil=octanoate;
1 to 5 % by weight of calcium dodecyl benzene sulfonate;
- 5 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
0.5 to 3 % by weight of sorbitan mono laurate;
1 to 10 % by weight of an aromatic hydrocarbon; and
rest of diethyl oxalate.
- 10 An emulsifiable concentrate comprising
0.5 to 5 % by weight of diflufenican;
1 to 30 % by weight of bromoxynil=octanoate;
1 to 30 % by weight of ioxynil=octanoate;
0.5 to 10 % by weight of an anionic surfactant;
- 15 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 10 % by weight of a sorbitan fatty acid ester;
1 to 40 % by weight of an aromatic hydrocarbon;
5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 20 5 to 80 % by weight of the compound shown by the formula (1).
- An emulsifiable concentrate comprising
2 to 5 % by weight of diflufenican;
10 to 20 % by weight of bromoxynil=octanoate;
- 25 5 to 15 % by weight of ioxynil=octanoate;
1 to 5 % by weight of an anionic surfactant;
3 to 8 % by weight of a nonionic surfactant which has polyalkylene
oxide structure in the molecule;
0.5 to 3 % by weight of a sorbitan fatty acid ester;

22 Feb 2006

2006200731

- 1 to 15 % by weight of an aromatic hydrocarbon;
- 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 10 to 50 % by weight of the compound shown by the formula (1).

- 5 An emulsifiable concentrate essentially consisting of
 - 0.5 to 5 % by weight of diflufenican;
 - 1 to 30 % by weight of bromoxynil-octanoate;
 - 1 to 30 % by weight of ioxynil-octanoate;
 - 0.5 to 10 % by weight of an anionic surfactant;
- 10 0.5 to 10 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 1 to 40 % by weight of an aromatic hydrocarbon;
 - 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 15 5 to 80 % by weight of the compound shown by the formula (1).

- An emulsifiable concentrate essentially consisting of
 - 2 to 5 % by weight of diflufenican;
 - 10 to 20 % by weight of bromoxynil-octanoate;
- 20 5 to 15 % by weight of ioxynil-octanoate;
 - 1 to 5 % by weight of an anionic surfactant;
 - 3 to 8 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
 - 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 25 1 to 15 % by weight of an aromatic hydrocarbon;
 - 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
 - 10 to 50 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

2006200731 22 Feb 2006

- 2 to 5 % by weight of diflufenican;
- 10 to 20 % by weight of bromoxynil=octanoate;
- 5 to 15 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of an anionic surfactant;
- 5 3 to 8 % by weight of a nonionic surfactant which has polyalkylene oxide structure in the molecule;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;
- 1 to 15 % by weight of an aromatic hydrocarbon;
- 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 10 rest of the compound shown by the formula (1).

An emulsifiable concentrate comprising

- 0.5 to 5 % by weight of diflufenican;
- 1 to 30 % by weight of bromoxynil=octanoate;
- 15 1 to 30 % by weight of ioxynil=octanoate;
- 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
- 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
- 0.5 to 10 % by weight of a sorbitan fatty acid ester;
- 1 to 40 % by weight of an aromatic hydrocarbon;
- 20 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 5 to 80 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate comprising

- 2 to 5 % by weight of diflufenican;
- 25 10 to 20 % by weight of bromoxynil=octanoate;
- 5 to 15 % by weight of ioxynil=octanoate;
- 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
- 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
- 0.5 to 3 % by weight of a sorbitan fatty acid ester;

22 Feb 2006

2006200731

- 1 to 15 % by weight of an aromatic hydrocarbon;
- 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 10 to 50 % by weight of the compound shown by the formula (1).

- 5 An emulsifiable concentrate essentially consisting of
 - 0.5 to 5 % by weight of diflufenican;
 - 1 to 30 % by weight of bromoxynil=octanoate;
 - 1 to 30 % by weight of ioxynil=octanoate;
 - 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
- 10 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 - 0.5 to 10 % by weight of a sorbitan fatty acid ester;
 - 1 to 40 % by weight of an aromatic hydrocarbon;
 - 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
 - 5 to 80 % by weight of the compound shown by the formula (1).

- 15 An emulsifiable concentrate essentially consisting of
 - 2 to 5 % by weight of diflufenican;
 - 10 to 20 % by weight of bromoxynil=octanoate;
 - 5 to 15 % by weight of ioxynil=octanoate;
- 20 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 - 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 - 0.5 to 3 % by weight of a sorbitan fatty acid ester;
 - 1 to 15 % by weight of an aromatic hydrocarbon;
 - 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
- 25 10 to 50 % by weight of the compound shown by the formula (1).

An emulsifiable concentrate essentially consisting of

- 2 to 5 % by weight of diflufenican;
- 10 to 20 % by weight of bromoxynil=octanoate;

2006200731 22 Feb 2006

- 5 to 15 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 0.5 to 3 % by weight of a sorbitan fatty acid ester;
 5 1 to 15 % by weight of an aromatic hydrocarbon;
 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
 rest of the compound shown by the formula (1)

- An emulsifiable concentrate comprising
 10 0.5 to 5 % by weight of diflufenican;
 1 to 30 % by weight of bromoxynil=octanoate;
 1 to 30 % by weight of ioxynil=octanoate;
 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 15 0.5 to 10 % by weight of sorbitan mono laurate;
 1 to 40 % by weight of an aromatic hydrocarbon;
 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
 5 to 80 % by weight of diethyl oxalate.

- 20 An emulsifiable concentrate comprising
 2 to 5 % by weight of diflufenican;
 10 to 20 % by weight of bromoxynil=octanoate;
 5 to 15 % by weight of ioxynil=octanoate;
 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 25 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 0.5 to 3 % by weight of sorbitan mono laurate;
 1 to 15 % by weight of an aromatic hydrocarbon;
 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
 10 to 50 % by weight of diethyl oxalate.

2006200731 22 Feb 2006

- An emulsifiable concentrate essentially consisting of
- 0.5 to 5 % by weight of diflufenican;
 - 1 to 30 % by weight of bromoxynil=octanoate;
 - 5 1 to 30 % by weight of ioxynil=octanoate;
 - 0.5 to 10 % by weight of calcium dodecyl benzene sulfonate;
 - 0.5 to 10 % by weight of polyoxypropylene tristyryl phenyl ether;
 - 0.5 to 10 % by weight of sorbitan mono laurate;
 - 1 to 40 % by weight of an aromatic hydrocarbon;
 - 10 5 to 80 % by weight of 1,3-dimethyl-2-imidazolidione; and
 - 5 to 80 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
- 2 to 5 % by weight of diflufenican;
 - 15 10 to 20 % by weight of bromoxynil=octanoate;
 - 5 to 15 % by weight of ioxynil=octanoate;
 - 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 - 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;
 - 0.5 to 3 % by weight of sorbitan mono laurate;
 - 20 1 to 15 % by weight of an aromatic hydrocarbon;
 - 10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
 - 10 to 50 % by weight of diethyl oxalate.

- An emulsifiable concentrate essentially consisting of
- 25 2 to 5 % by weight of diflufenican;
 - 10 to 20 % by weight of bromoxynil=octanoate;
 - 5 to 15 % by weight of ioxynil=octanoate;
 - 1 to 5 % by weight of calcium dodecyl benzene sulfonate;
 - 3 to 8 % by weight of polyoxypropylene tristyryl phenyl ether;

22 Feb 2006

2006200731

0.5 to 3 % by weight of sorbitan mono laurate;
1 to 15 % by weight of an aromatic hydrocarbon;
10 to 50 % by weight of 1,3-dimethyl-2-imidazolidione; and
rest of diethyl oxalate.

5

The emulsifiable concentrate of the present invention can be produced by mixing the component of the emulsifiable concentrate of the present invention, then stirring until the mixture becomes uniform. The temperature while stirring is usually in the range between room temperature and 85 °C. The mixing order of the component of the emulsifiable concentrate of the present invention may be properly decided.

10

15

20

The emulsifiable concentrate of the present invention is usually applied after diluted with water to a weed or soil surface where weed is predicted to grow. An aqueous composition which is obtained by diluted the emulsifiable concentrate of the present invention with water is a diluted composition of the emulsifiable concentrate of the present invention with water of the amount of usually 10 to 5000 times, preferably 20 to 2500 times based on the amount of the emulsifiable concentrate of the present invention. Generally, the water used to dilution may be soft water or hard water. Auxiliaries such as spreader may be added to the water used to dilution, if necessary.

25

Though the application amount of the aqueous composition which is obtained by diluted the emulsifiable concentrate of the present invention with water may vary depending on the ratio of diflufenican, bromoxynil-octanoate and ioxynil-octanoate; weather conditions; the treatment timing; the treatment place; the kind of a weed which is controlled, it is

22 Feb 2006

2006200731

usually 40 to 2000g, preferably 80 to 1000g per hectare as total weight of diflufenican, bromoxynil=octanoate and ioxynil=octanoate.

5

EXAMPLES

Hereinafter, the present invention will be further explained in detail by way of Preparation Examples and Test Examples, but the present invention is not limited to these examples.

10

Preparation Example 1-1

15

Diflufenican(purity 91 %, 3.6 g as active ingredient), bromoxynil=octanoate(purity 95.4 %, 17.33 g as active ingredient) and ioxynil=octanoate(purity 96 %, 9.65 g as active ingredient) were added to diethyl oxalate(40.54 g) under heating and were dissolved. Then calcium dodecyl benzene sulfonate (Rhodacal 60/BE, surfactant produced by Rhodia Nicca; 3.83 g) and polyoxypropylene castor oil(Alkamuls OR40, surfactant produced by Rhodia Nicca; 3.83 g) were added to it. Furthermore, aromatic hydrocarbon(mainly C10 to C11 alkylbenzene, Solvesso 150 ND, CAS No. 64742-94-5, Exxon Mobil Chemical Company) was added until total amount being 100 ml, and stirred until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 1-1, hereinafter).

20

Test Example 1-1

The emulsifiable concentrate of the present invention 1-1 was diluted by CIPAC standard water D (342ppm) for 100 times in a 100 ml - graduated cylinder with stopper. It was left at 30 °C for 2 hours, and was observed the stability of the emulsion. After

22 Feb 2006

2006200731

that, the aqueous composition which was obtained by diluted the emulsifiable concentrate of the present invention 1-1 with water kept stable emulsion.

Preparation Example 1-2

- 5 Diflufenican(4.0 g as active ingredient), calcium dodecyl benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia Nicca; 4.75 g) and polyoxyethylene-polyoxypropylene tristyryl phenyl ether(Soprophor 796/P, surfactant produced by Rhodia Nicca; 2.25 g) were measured in a 100 ml graduated flask at 20 °C.
- 10 Then diethyl oxalate was added until the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 1-2, hereinafter).

Preparation Example 1-3

- 15 Diflufenican(4.0 g as active ingredient), calcium dodecyl benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia Nicca; 5.50 g) and polyoxyethylene-polyoxypropylene tristyryl phenyl ether(Soprophor 796/P, surfactant produced by Rhodia Nicca; 1.50 g) were measured in a 100 ml graduated flask at 20 °C.
- 20 Then diethyl oxalate was added until the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 1-3 hereinafter).

Test Example 1-2

- 25 Each of the emulsifiable concentrate of the present invention 1 and 2 was diluted by CIPAC standard water D (342ppm) for 100 times in a 100 ml - graduated cylinder with stopper. They were left at 30 °C for 2 hours, and were observed the stability of the emulsion. After that, the aqueous composition which were

2006200731 22 Feb 2006

obtained by diluting the emulsifiable concentrate of the present invention 1-2 and 1-3 with water kept stable emulsion.

Preparation Example 1-4

5 Diflufenican(3.71 g as active ingredient),
 5 bromoxynil=octanoate(18.22 g as active ingredient),
 ioxynil=octanoate(9.63g as active ingredient), calcium dodecyl
 benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia
 Nicca; 3.17 g) and polyoxyethylene-polyoxypropylene tristyryl
 phenyl ether(Soprophor 796/P, surfactant produced by Rhodia
 10 Nicca; 4.52 g) were measured in a 100 ml graduated flask at 20 °C.
 Then diethyl oxalate was added until the total amount being 100
 ml. It was stirred until uniform solution to give the emulsifiable
 concentrate of the present invention(referred as the emulsifiable
 concentrate of the present invention 1-4 hereinafter).

15 Preparation Example 1-5

 Diflufenican(3.71 g as active ingredient),
 bromoxynil=octanoate(18.22 g as active ingredient),
 ioxynil=octanoate(9.63g as active ingredient), calcium dodecyl
 benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia
 20 Nicca; 3.17 g) and polyoxyethylene-polyoxypropylene tristyryl
 phenyl ether(Soprophor 796/P, surfactant produced by Rhodia
 Nicca; 4.52 g) were measured in a 100 ml graduated flask at 20 °C.
 Then diethyl oxalate(40.39 g) and Solvesso 200 ND(mainly C11 to
 C14 alkyl naphthalene, aromatic hydrocarbon, Exxon Mobil Chemical
 25 Company; 20.16 g) were added. It was stirred until uniform
 solution to give the emulsifiable concentrate of the present
 invention(referred as the emulsifiable concentrate of the present
 invention 1-5 hereinafter).

Test Example 1-3

2006200731 22 Feb 2006

Each of the emulsifiable concentrate of the present invention 1-4 and 1-5 was diluted by CIPAC standard water D (342 ppm) for 100 times in a 100 ml - graduated cylinder with stopper. They were left at 30 °C for 2 hours, and were observed the stability of the emulsion. After that, the aqueous composition which were obtained by diluting the emulsifiable concentrate of the present invention 1-4 and 1-5 with water kept stable emulsion.

Preparation Example 2-1

10 Diflufenican (purity 93.2 %, 4.0 g as active ingredient), calcium dodecyl benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia Nicca; 4.00 g), polyoxyethylene-polyoxypropylene tristyryl phenyl ether (Soprophor 796/P, produced by Rhodia Nicca; 3.00 g) and 15 1,3-dimethyl-2-imidazolidinone (45.00 g) were measured to a 100 ml - graduated flask, and filled to 100 ml with diethyl oxalate. Then it was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 2-1, hereinafter).

20 Preparation Example 2-2

Diflufenican (4.0 g as active ingredient), calcium dodecyl benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia Nicca; 4.75 g), polyoxyethylene-polyoxypropylene tristyryl phenyl ether (Soprophor 796/P, produced by Rhodia Nicca; 2.25 g) 25 and 1,3-dimethyl-2-imidazolidinone (45.00 g) were measured to a 100 ml - graduated flask, and filled to 100 ml with diethyl oxalate. Then it was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 2-2, hereinafter).

2006200731 22 Feb 2006

Preparation Example 2-3

5 Diflufenican(4.0 g as active ingredient), calcium dodecyl
benzene sulfonate (Rhodacal 70, surfactant produced by Rhodia
10 Nicca; 5.50 g), polyoxyethylene-polyoxypropylene tristyryl
phenyl ether(Soprophor 796/P, produced by Rhodia Nicca; 1.50 g)
and 1,3-dimethyl-2-imidazolidinone(45.00 g) were measured to a
100 ml - graduated flask, and filled to 100 ml with diethyl oxalate.
Then it was stirred until uniform solution to give the emulsifiable
10 concentrate of the present invention(referred as the emulsifiable
concentrate of the present invention 2-3, hereinafter).

Test Example 2-1

 Each of the emulsifiable concentrate of the present
invention 2-1 to 2-3 was diluted by CIPAC standard water D (342ppm)
15 for 100 times in a 100 ml - graduated cylinder with stopper. It
was left at 30 °C for 2 hours, and was observed the stability
of the emulsion. After that, the aqueous composition which was
obtained by diluting the emulsifiable concentrate of the present
invention 2-1 to 2-3 with water kept stable emulsion.

20 Preparation Example 2-4

 Diflufenican(4.0 g as active ingredient),
bromoxynil=octanoate(purity 94.8%, 18.00 g as active ingredient),
ioxynil=octanoate(purity 96 %, 10.5 g as active ingredient),
calcium dodecyl benzene sulfonate (NANSA EVM62/H, surfactant
25 produced by Huntsman; 3.00 g) and polyoxypropylene castor
oil(Alkamuls OR40, surfactant produced by Rhodia Nicca; 6.00 g)
and 1,3-dimethyl-2-imidazolidinone(45.00 g) were measured to a
100 ml - graduated flask, and filled to 100 ml with aromatic
hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200

22 Feb 2006

2006200731

ND, produced by Exxon Mobil Chemical Company). Then it was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 2-4, hereinafter).

5 Preparation Example 2-5

Di flufenican (4.0 g as active ingredient),
bromoxynil-octanoate (18.00 g as active ingredient),
ioxynil-octanoate (10.05 g as active ingredient), calcium dodecyl
benzene sulfonate (NANSA EVM62/H, surfactant produced by
10 Huntsman; 4.50 g) and polyoxyethylene tristyril phenyl
ether (Soprophor BSU, produced by Rhodia Nicca; 4.5 g) and
1,3-dimethyl-2-imidazolidinone (45.00 g) were measured to a 100
ml - graduated flask, and filled to 100 ml with aromatic
hydrocarbon (include C11 to C14 alkyl naphthalene, Solvesso 200

15 ND, produced by Exxon Mobil Chemical Company). Then it was stirred until uniform solution to give the emulsifiable concentrate of the present invention (referred as the emulsifiable concentrate of the present invention 2-5, hereinafter).

Preparation Example 2-6

20 Di flufenican (4.0 g as active ingredient),
bromoxynil-octanoate (18.00 g as active ingredient),
ioxynil-octanoate (10.05 g as active ingredient), calcium dodecyl
benzene sulfonate (NANSA EVM62/H, surfactant produced by
Huntsman; 4.00 g) and polyoxyethylene tristyril phenyl
25 ether (Soprophor BSU, produced by Rhodia Nicca; 5.0 g) and
1,3-dimethyl-2-imidazolidinone (45.00 g) were measured to a 100
ml - graduated flask, and filled to 100 ml with aromatic
hydrocarbon (include C11 to C14 alkyl naphthalene, Solvesso 200
ND, produced by Exxon Mobil Chemical Company). Then it was stirred

22 Feb 2006

2006200731

until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 2-6, hereinafter).

Test Example 2-2

- 5 Each of the emulsifiable concentrate of the present invention 2-4 to 2-6 was diluted by CIPAC standard water D (342ppm) for 100 times in a 100 ml - graduated cylinder with stopper. It was left at 30 °C for 0.5 hours, and was observed the stability of the emulsion. After that, the aqueous composition which was
10 obtained by diluting the emulsifiable concentrate of the present invention 2-4 to 2-6 with water kept stable emulsion.

Preparation Example 2-7

- Di flufenican(2.0 g as active ingredient), calcium dodecyl benzene sulfonate (NANSA EVM62/H, surfactant produced by
15 Huntsman; 3.00 g), polyoxyethylene-polyoxypropylene tristyryl phenyl ether(Soprophor 796/P, produced by Rhodia Nicca; 3.00 g) and 1,3-dimethyl-2-imidazolidinone(10.00 g) are measured to a 100 ml - graduated flask, and fill to 100 ml with aromatic hydrocarbon(include C10 to C11 alkylbenzene, Solvesso 150 ND,
20 produced by Exxon Mobil Chemical Company). Then it is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 2-8

- Di flufenican(4.0 g as active ingredient),
25 bromoxynil=octanoate(18.00 g as active ingredient), ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl benzene sulfonate (Rodacal 70, surfactant produced by Rhodia Nicca; 3.00 g) and polyoxyethylene alkyl ether(Tensiofix 96DB10, produced by Omni Chemical; 6.0 g) and

2006200731 22 Feb 2006

1,3-dimethyl-2-imidazolidinone(30.00 g) are measured to a 100 ml - graduated flask, and fill to 100 ml with aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company). Then it is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 2-9

Diflufenican(4.0 g as active ingredient), bromoxynil=octanoate(18.00 g as active ingredient), ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl benzene sulfonate (NANSA EVM62/H, surfactant produced by Huntsman; 5.00 g), polyoxyethylene tristyril phenyl ether(Soprophor BSU, produced by Rhodia Nicca; 4.00 g), 1,3-dimethyl-2-imidazolidinone (15.00 g) and aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 10.00 g) are measured to a 100 ml - graduated flask, and fill to 100 ml with diethyl oxalate. Then it is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

20 Preparation Example 2-10

Diflufenican(4.0 g as active ingredient), bromoxynil=octanoate(18.00 g as active ingredient), ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl benzene sulfonate (NANSA EVM62/H, surfactant produced by Huntsman; 5.00 g), polyoxyethylene tristyril phenyl ether(Soprophor BSU, produced by Rhodia Nicca; 4.00 g), 1,3-dimethyl-2-imidazolidinone (20.00 g) and aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 10.00 g) are measured

2006200731 22 Feb 2006

to a 100 ml - graduated flask, and fill to 100 ml with diethyl oxalate. Then it is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 2-11

5 Diflufenican(4.0 g as active ingredient),
bromoxynil=octanoate(18.00 g as active ingredient),
ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl
benzene sulfonate (NANSA EVM62/H, surfactant produced by
Huntsman; 4.50 g), polyoxyethylene-polyoxypropylene tristyryl
10 phenyl ether(Soprophor 796/P, surfactant produced by Rhodia
Nicca; 4.50 g) and 1,3-dimethyl-2-imidazolidinone (30.00 g) are
measured to a 100 ml - graduated flask, and fill to 100 ml with
aromatic hydrocarbon(include C10 to C11 alkylbenzene, Solvesso
150 ND, produced by Exxon Mobil Chemical Company). Then it is
15 stirred until uniform solution to give the emulsifiable
concentrate of the present invention.

Preparation Example 2-12

 Diflufenican(3.72 g as active ingredient),
bromoxynil=octanoate(16.74 g as active ingredient),
20 ioxynil=octanoate(9.35 g as active ingredient), calcium dodecyl
benzene sulfonate (NANSA EVM62/H, surfactant produced by
Huntsman; 4.50 g), polyoxyethylene-polyoxypropylene tristyryl
phenyl ether(Soprophor 796/P, surfactant produced by Rhodia
Nicca; 4.50 g) and 1,3-dimethyl-2-imidazolidinone (20.00 g) are
25 measured to a 100 ml - graduated flask, and fill to 100 ml with
aromatic hydrocarbon(include C10 to C11 alkylbenzene, Solvesso
150 ND, produced by Exxon Mobil Chemical Company). Then it is
stirred until uniform solution to give the emulsifiable
concentrate of the present invention.

2006200731 22 Feb 2006

Preparation Example 2-13

Di flufenican(2.68 g as active ingredient),
 bromoxynil=octanoate(12.06 g as active ingredient),
 ioxynil=octanoate(6.73 g as active ingredient), calcium dodecyl
 5 benzene sulfonate (NANSA EVM62/H, surfactant produced by
 Huntsman; 4.50 g), polyoxyethylene-polyoxypropylene tristyryl
 phenyl ether(Soprophor 796/P, surfactant produced by Rhodia
 Nicca; 4.50 g) and 1,3-dimethyl-2-imidazolidinone (15.00 g) are
 measured to a 100 ml - graduated flask, and fill to 100 ml with
 10 aromatic hydrocarbon(include C10 to C11 alkylbenzene, Solvesso
 150 ND, produced by Exxon Mobil Chemical Company). Then it is
 stirred until uniform solution to give the emulsifiable
 concentrate of the present invention.

15 Preparation Example 3-1

Di flufenican(purity 93.2 %, 3.72 g as active ingredient),
 bromoxynil=octanoate(purity 94.8 %, 16.74 g as active ingredient),
 ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient),
 calcium dodecyl benzene sulfonate (3.67 g), polyoxyethylene
 20 tristyryl phenyl ether(HLB 12.6; 6.33 g), sorbitan mono
 laurate(HLB 8.6; 3.00 g), aromatic hydrocarbon(include C11 to
 C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil
 Chemical Company; 5.00 g) and N-methyl-2-pyrrolidone(5.70 g) were
 measured in a 100 ml graduated flask. Then diethyl oxalate was
 25 added until the total amount being 100 ml. It was stirred until
 uniform solution to give the emulsifiable concentrate of the
 present invention(referred as the emulsifiable concentrate of
 the present invention 3-1, hereinafter).

Preparation Example 3-2

22 Feb 2006

2006200731

At 20 °C, diflufenican(purity 93.2 %, 3.72 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 16.74 g as active ingredient), ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient), calcium dodecyl benzene sulfonate (3.95 g),
5 polyoxyethylene tristyryl phenyl ether(HLB 12.6; 7.55 g), sorbitan mono laurate(HLB 8.6; 1.50 g), aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 10.00 g) and 1,3-dimethyl-2-imidazolidinone(15.00 g) were measured in a 100
10 ml graduated flask. Then diethyl oxalate was added until the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 3-2, hereinafter).

15 Preparation Example 3-3

At 20 °C, diflufenican(purity 93.2 %, 2.68 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 12.06 g as active ingredient), ioxynil=octanoate(purity 96 %, 6.37 g as active ingredient), calcium dodecyl benzene sulfonate (2.70 g),
20 polyoxyethylene tristyryl phenyl ether(HLB 12.6; 6.30 g), sorbitan mono laurate(HLB 8.6; 1.00 g) and aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 5.00 g) were measured in a 100 ml graduated flask. Then diethyl oxalate was added until
25 the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 3-3, hereinafter).

Test Example 3-1

2006200731 22 Feb 2006

Each of the emulsifiable concentrate of the present invention 3-1 to 3-3 was filled in the bottle. They were kept in refrigerator for 7 days at 0 °C. Then each bottle was taken out from the refrigerator, and kept for about 30 minutes at room temperature. After that, it was observed whether solid substance existed or not in the bottom of the bottle. There were no solid substance in each of them, and each of them was clear and uniform solution.

Test Example 3-2

Into a 100ml-graduated cylinder with stopper, 99ml of CIPAC standard water D (342ppm) were charged. The graduated cylinder was put in a thermostat and was kept at 30 °C for a while. Further, 1ml each of the emulsifiable concentrate of the present invention 3-1 to 3-3 were added into the graduated cylinder, and the cylinder was turned upside down 10 times at a rate of once per two seconds. Then, it was put in a thermostat again and left at 30 °C for 2 hours. After that, each of the state of the emulsion in the graduated cylinder was observed. Each was provided uniform emulsion state.

Preparation Example 3-4

At 20 °C, diflufenican(purity 93.2 %, 2.68 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 12.06 g as active ingredient), ioxynil=octanoate(purity 96 %, 6.37 g as active ingredient), calcium dodecyl benzene sulfonate (2.90 g), polyoxyethylene tristyryl phenyl ether(HLB 12.6; 12.20 g), sorbitan mono oleate(HLB 4.3; 1.00 g) and aromatic hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 10.00 g) were measured in a 100 ml graduated flask. Then diethyl oxalate was

22 Feb 2006

2006200731

added until the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 3-4, hereinafter).

5 Preparation Example 3-5

At 20 °C, diflufenican(purity 93.2 %, 2.68 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 12.06 g as active ingredient), ioxynil=octanoate(purity 96 %, 6.37 g as active ingredient), calcium dodecyl benzene sulfonate (2.90 g), polyoxyethylene tristyryl phenyl ether(HLB 12.6; 12.20 g), sorbitan mono laurate(HLB 8.6; 1.00 g) and aromatic

hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 10.00 g) were measured in a 100 ml graduated flask. Then diethyl oxalate was added until the total amount being 100 ml. It was stirred until uniform solution to give the emulsifiable concentrate of the present invention(referred as the emulsifiable concentrate of the present invention 3-5, hereinafter).

Test Example 3-3

Each of the emulsifiable concentrate of the present invention 3-4 to 3-5 was filled in the bottle. They were kept in refrigerator for 7 days at -5 °C. Then each bottle was taken out from the refrigerator, and kept for about 30 minutes at room temperature. After that, it was observed whether solid substance existed or not in the bottom of the bottle. There were no solid substance in each of them, and each of them was clear and uniform solution.

Preparation Example 3-6

Diflufenican(purity 93.2 %, 3.72 g as active ingredient),

2006200731 22 Feb 2006

bromoxynil=octanoate(purity 94.8%, 16.74 g as active ingredient),
ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient),
calcium dodecyl benzene sulfonate (5.00 g), polyoxyethylene
tristyryl phenylether(HLB 12.6; 4.00 g), sorbitan monooleate(HLB
5 4.3; 1.00 g), aromatic hydrocarbon(include C11 to C14
alkylnaphthalene, Solvesso 200 ND, produced by Exxon Mobil
Chemical Company; 10.00 g) and N-methyl-2-pyrrolidone(5.70 g)
are measured in a 100 ml graduated flask. Then diethyl oxalate
is added until the total amount being 100 ml. It is stirred until
10 uniform solution to give the emulsifiable concentrate of the
present invention.

Preparation Example 3-7

Diflufenican(purity 93.2 %, 3.72 g as active ingredient),
bromoxynil=octanoate(purity 94.8%, 16.74 g as active ingredient),
15 ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient),
calcium dodecyl benzene sulfonate (5.00 g), polyoxyethylene
tristyryl phenyl ether(HLB 12.6; 4.00 g), sorbitan mono
laurate(HLB 8.6; 1.00 g), aromatic hydrocarbon(include C11 to
C14 alkylnaphthalene, Solvesso 200 ND, produced by Exxon Mobil
20 Chemical Company; 10.00 g) and N-methyl-2-pyrrolidone(5.70 g)
are measured in a 100 ml graduated flask. Then diethyl oxalate
is added until the total amount being 100 ml. It is stirred until
uniform solution to give the emulsifiable concentrate of the
present invention.

25 Preparation Example 3-8

Diflufenican(purity 93.2 %, 3.72 g as active ingredient),
bromoxynil=octanoate(purity 94.8%, 16.74 g as active ingredient),
ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient),
calcium dodecyl benzene sulfonate (5.00 g), polyoxyethylene

2006200731 22 Feb 2006

tristyryl phenyl ether(HLB 12.6; 4.00 g), sorbitan mono laurate(HLB 8.6; 1.00 g), aromatic hydrocarbon(include C11 to C14 alkylnaphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 12.00 g) and N,N-dimethylacetamide(5.70 g) are measured in a 100 ml graduated flask. Then diethyl oxalate is added until the total amount being 100 ml. It is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 3-9

10 Diflufenican(purity 93.2 %, 3.72 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 16.74 g as active ingredient), ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient), calcium dodecyl benzene sulfonate (5.00 g), polyoxyethylene caster oil(HLB 13.5; 4.00 g), sorbitan mono laurate(HLB 8.6; 1.00 g), aromatic hydrocarbon(include C11 to C14 alkylnaphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 12.00 g) and N-methyl-2-pyrrolidone(5.70 g) are measured in a 100 ml graduated flask. Then diethyl oxalate is added until the total amount being 100 ml. It is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 3-10

25 Diflufenican(purity 93.2 %, 3.72 g as active ingredient), bromoxynil=octanoate(purity 94.8 %, 16.74 g as active ingredient), ioxynil=octanoate(purity 96 %, 9.35 g as active ingredient), calcium dodecyl benzene sulfonate (5.00 g), sorbitan mono laurate(HLB 8.6; 5.00 g), aromatic hydrocarbon(include C11 to C14 alkylnaphthalene, Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 12.00 g) and 1,3-dimethyl-2-imidazolidinone(5.7 g) are measured in a 100 ml

2006200731 22 Feb 2006

graduated flask. Then diethyl oxalate is added until the total amount being 100 ml. It is stirred until uniform solution to give the emulsifiable concentrate of the present invention.

Preparation Example 3-11

5 Diflufenican(purity 93.2 %, 3.72 g as active ingredient),
 calcium dodecyl benzene sulfonate (5.00 g),
 polyoxyethylene tristyryl phenyl ether(HLB 12.6; 4.00 g),
 sorbitan mono laurate(HLB 8.6; 1.00 g), aromatic
 hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200
 10 ND, produced by Exxon Mobil Chemical Company; 12.00 g) and
 N-methyl-2-pyrrolidone(5.70 g) are measured in a 100 ml graduated
 flask. Then diethyl oxalate is added until the total amount being
 100 ml. It is stirred until uniform solution to give the
 emulsifiable concentrate of the present invention.

15

Preparation Example 4-1

 Diflufenican(4.00 g as active ingredient),
 bromoxynil=octanoate(18.00 g as active ingredient),
 ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl
 20 benzene sulfonate (3.20 g), butylpolyalkyleneoxide block
 copolymer(Toximul 8320, produced by Stepan; 4.80 g), aromatic
 hydrocarbon(include C11 to C14 alkyl naphthalene, Solvesso 200
 ND, produced by Exxon Mobil Chemical Company; 5.00 g)
 1,3-dimethyl-2-imidazolizinone(15.00 g) and
 25 N-methyl-2-pyrrolidone(5.50 g) were measured in a 100 ml graduated
 flask. Then diethyl oxalate was added until the total amount
 being 100 ml. It was stirred until uniform solution to give the
 emulsifiable concentrate of the present invention(referred as
 the emulsifiable concentrate of the present invention 4-1,

2006200731 22 Feb 2006

hereinafter).

Preparation Example 4-2

- 5 Diflufenican(4.00 g as active ingredient),
 bromoxynil-octanoate(18.00 g as active ingredient),
10 ioxynil-octanoate(10.05 g as active ingredient), calcium dodecyl
 benzene sulfonate (3.20 g), polyalkyleneoxide block
 copolymer(Toximul 8323, produced by Stepan; 4.80 g), aromatic
 hydrocarbon(include C11 to C14 alkylnaphthalene, Solvesso 200
 ND, produced by Exxon Mobil Chemical Company; 5.00 g)
15 1,3-dimethyl-2-imidazolizinone(15.00 g) and
 N-methyl-2-pyrrolidone(5.50 g) were measured in a 100 ml graduated
 flask. Then diethyl oxalate was added until the total amount
 being 100 ml. It was stirred until uniform solution to give the
 emulsifiable concentrate of the present invention(referred as
15 the emulsifiable concentrate of the present invention 4-2,
 hereinafter).

Preparation Example 4-3

- Diflufenican(4.00 g as active ingredient),
 bromoxynil-octanoate(18.00 g as active ingredient),
20 ioxynil-octanoate(10.05 g as active ingredient), calcium dodecyl
 benzene sulfonate (3.20 g), polyalkyleneoxide block
 copolymer(Step-Flow 26, produced by Stepan; 4.80 g), aromatic
 hydrocarbon(include C11 to C14 alkylnaphthalene, Solvesso 200
 ND, produced by Exxon Mobil Chemical Company; 5.00 g)
25 1,3-dimethyl-2-imidazolizinone(15.00 g) and
 N-methyl-2-pyrrolidone(5.50 g) were measured in a 100 ml graduated
 flask. Then diethyl oxalate was added until the total amount
 being 100 ml. It was stirred until uniform solution to give the
 emulsifiable concentrate of the present invention(referred as

2006200731 22 Feb 2006

the emulsifiable concentrate of the present invention 4-3, hereinafter).

Preparation Example 4-4

- 5 Diflufenican(4.00 g as active ingredient),
 bromoxynil=octanoate(18.00 g as active ingredient),
 ioxynil=octanoate(10.05 g as active ingredient), calcium dodecyl
 benzene sulfonate (3.20 g), polyalkyleneoxide block
 copolymer(Ethylan NS 500 LQ, produced by Akzo Nobel; 4.80 g),
 aromatic hydrocarbon(include C11 to C14 alkyl naphthalene,
 10 Solvesso 200 ND, produced by Exxon Mobil Chemical Company; 5.00
 g) 1,3-dimethyl-2-imidazolizinone(15.00 g) and
 N-methyl-2-pyrrolidone(5.50 g) were measured in a 100 ml graduated
 flask. Then diethyl oxalate was added until the total amount
 being 100 ml. It was stirred until uniform solution to give the
 15 emulsifiable concentrate of the present invention(referred as
 the emulsifiable concentrate of the present invention 4-4,
 hereinafter).

Test Example 4-1

- Into a 100 ml graduated cylinder with stopper, 98 ml of CIPAC
 20 standard water D (342 ppm) were charged. The graduated cylinder
 was put in a thermostat and was kept at 30 °C for a while. Further,
 2 ml each of the emulsifiable concentrate of the present invention
 4-1 to 4-4 were added into the graduated cylinder, and the cylinder
 was turned upside down 10 times at a rate of once per two seconds.
 25 Then, it was put in a thermostat again and left at 30 °C for 2
 hours. After that, each of the state of the emulsion in the
 graduated cylinder was observed. Each was provided uniform
 emulsion state.

INDUSTRIAL APPLICABILITY

The emulsifiable concentrate of the present invention is useful as pesticide formulation because it has an excellent stability of the emulsion even after diluted with water.

5

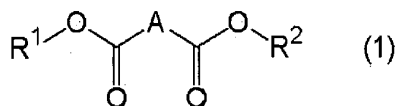
2006200731 22 Feb 2006

2006200731 22 Feb 2006

The claims defining the invention are as follows:

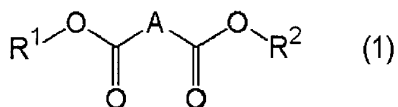
1. An emulsifiable concentrate, which is characterized by comprising

5 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinanilide; the compound shown by the below formula (1):



wherein, in the formula, R^1 and R^2 represent alkyl groups, A represents a single bond or an alkylene group, and the sum of
10 the number of carbon atoms which consist of the groups of R^1 , R^2 and A is 2 to 8; and a surfactant.

2. An emulsifiable concentrate, which is characterized by comprising
15 0.5 to 5 % by weight of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinanilide; 5 to 80 % by weight of the compound shown by the below formula (1):



20 wherein, in the formula, R^1 and R^2 represent alkyl groups, A represents a single bond or an alkylene group, and the sum of the number of carbon atoms which consist of the groups of R^1 , R^2 and A is 2 to 8; and
25 4 to 20 % by weight of a surfactant.

22 Feb 2006

2006200731

3. The emulsifiable concentrate according to claim 1 or 2, wherein the compound shown by the formula (1) is diethyl oxalate.
- 5 4. The emulsifiable concentrate according to any one of claims 1 to 3, wherein the ratio of the compound shown by the formula (1) is 5 to 80 by weight for one weight of 2',4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide.
- 10 5. The emulsifiable concentrate according to any one of claims 1 to 4, wherein the emulsifiable concentrate comprises an aromatic hydrocarbon.
- 15 6. The emulsifiable concentrate according to any one of claims 1 to 4, wherein the emulsifiable concentrate comprises 1 to 40 % by weight of an aromatic hydrocarbon.
- 20 7. The emulsifiable concentrate according to any one of claims 1 to 6, wherein the emulsifiable concentrate comprises 1,3-dimethyl-2-imidazolidinone.
- 25 8. The emulsifiable concentrate according to any one of claims 1 to 6, wherein the emulsifiable concentrate comprises 5 to 60 by weight of 1,3-dimethyl-2-imidazolidinone.
9. The emulsifiable concentrate according to any one of claims 1 to 8, wherein the surfactant is an anionic surfactant and a nonionic surfactant; and the ratio by weight of the anionic

2006200731 22 Feb 2006

surfactant and the nonionic surfactant is 1:0.1 to 1:10.

10. The emulsifiable concentrate according to claim
9, wherein the anionic surfactant is an alkylbenzenesulfonic acid
5 salt.

11. The emulsifiable concentrate according to claim
9 or 10, wherein the nonionic surfactant is the nonionic surfactant
which has polyalkylene oxide structure in the molecule.
10

12. The emulsifiable concentrate according to claim
11, wherein the nonionic surfactant which has polyalkylene oxide
structure in the molecule is the surfactant selected from the
group consisting of polyoxyethylene-polyoxypropylene tristyryl
15 phenyl ether, polyoxyethylene tristyryl phenyl ether and
polyoxyethylene castor oil.

13. The emulsifiable concentrate according to claim
9 or 10, wherein the nonionic surfactant is a sorbitan fatty acid
20 ester.

14. The emulsifiable concentrate according to claim
1, wherein the emulsifiable concentrate comprises
4-cyano-2,6-dibromophenyl octanoate and
25 4-cyano-2,6-diiodophenyl octanoate.

15. The emulsifiable concentrate according to claim
2, wherein the emulsifiable concentrate comprises 1 to 30 % by
weight of 4-cyano-2,6-dibromophenyl octanoate and 1 to 30 % by

weight of 4-cyano-2, 6-diiodophenyl octanoate.

16. The emulsifiable concentrate according to claims 14 or 15, wherein the ratio of the compound shown by the formula (I) is 5 to 80 by weight for the weight of 2', 4'-difluoro-2-(a,a,a-trifluoro-m-tolyloxy)nicotinilide.

17. The emulsifiable concentrate according to any one of claims 14 to 16, wherein the surfactant is an anionic surfactant and a nonionic surfactant; and the ratio by weight of the anionic surfactant and the nonionic surfactant is 1:0.1 to 1:10.

18. The emulsifiable concentrate according to any one of claims 11 to 14, wherein the compound shown by the formula (I) is diethyl oxalate.

19. The emulsifiable concentrate according to any one of claims 14 to 18, wherein the emulsifiable concentrate comprises an aromatic hydrocarbon.

Dated 20 April, 2011

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