



(51) International Patent Classification:

A01N 37/40 (2006.01) *A01N 25/00* (2006.01)
A01N 57/20 (2006.01)

(21) International Application Number:

PCT/EP2012/063954

(22) International Filing Date:

17 July 2012 (17.07.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/514,073	2 August 2011 (02.08.2011)	US
11177313.1	11 August 2011 (11.08.2011)	EP
61/554,526	2 November 2011 (02.11.2011)	US
61/613,535	21 March 2012 (21.03.2012)	US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: AQUEOUS COMPOSITION COMPRISING A PESTICIDE AND A BASE SELECTED FROM AN ALKALI SALT OF HY-DROGENCARBONATE

(57) Abstract: Aqueous composition comprising a pesticide and a base selected from an alkali salt of hydrogencarbonate The invention relates to a liquid aqueous composition, which has a pH value of at least 7,0, comprising a pesticide and a base selected from an alkali salt of hydrogencarbonate; a method for preparing said composition comprising a step of contacting a pesticide and a base selected from an alkali salt of hydrogencarbonate; and a method of combating harmful insects and/or phytopathogenic fungi, which comprises contacting plants, seed, soil or habitat of plants in or on which the harmful insects and/or phytopathogenic fungi are growing or may grow, plants, seed or soil to be protected from attack or infestation by said harmful insects and/or phytopathogenic fungi with an effective amount of the composition.



Aqueous composition comprising a pesticide and a base selected from an alkali salt of hydrogencarbonate

The invention relates to a liquid aqueous composition, which has a pH value of at least 7,0, comprising a pesticide and a base selected from an alkali salt of hydrogencarbonate; a method for preparing said composition comprising a step of contacting a pesticide and a base selected from an alkali salt of hydrogencarbonate; and a method of combating harmful insects and/or phytopathogenic fungi, which comprises contacting plants, seed, soil or habitat of plants in or on which the harmful insects and/or phytopathogenic fungi are growing or may grow, plants, seed or soil to be protected from attack or infestation by said harmful insects and/or phytopathogenic fungi with an effective amount of the composition. The present invention further relates to a composition comprising an alkali metal salt of dicamba and an alkali metal salt of glyphosate; a method for preparing the said composition comprising a step of contacting an alkali metal salt of dicamba and an alkali metal salt of glyphosate; a method of combating harmful insects and/or phytopathogenic fungi, which comprises contacting plants, seed, soil or habitat of plants in or on which the harmful insects and/or phytopathogenic fungi are growing or may grow, plants, seed or soil to be protected from attack or infestation by said harmful insects and/or phytopathogenic fungi with an effective amount of the said composition; a method of controlling undesired vegetation, which comprises allowing a herbicidal effective amount of said composition to act on plants, their habitat or on seed of said plants; and to seed comprising said composition. The preferred embodiments of the invention mentioned herein below have to be understood as being preferred either independently from each other or in combination with one another.

Often, pesticides, such as auxin herbicides (e.g. dicamba) are applied in a medium, that results in an at least partly protonated form in an equilibrium of the active (i.e. in an acidic environment at pH below 4,0), as the protonated form is said to lead to an improved leaf uptake and thus biological performance. In many case the pH value of the compositions and the tank mixes is acidic. This is because the water used for the preparation of the tank mix is acidic, such as acidic untreated natural water. In other cases, the addition of acidic pesticides (e.g. glyphosate), acidic additives (e.g. Dash®), or other additives (e.g. ammonium sulfate AMS), could result in an acidic tank mixture.

When using auxin herbicides such as dicamba for controlling undesired vegetation usually a herbicidal effective amount of said auxin herbicides is applied. However, the application can in unfavourable conditions result in unwanted phytotoxic damage in neighboring areas in which other crops (e.g. dicotyledon crops) grow. Another problems when using auxin herbicides for controlling undesired vegetation is that the herbicidal effect may still be increased. Another problem when using pesticides in crop protection is that the pesticidal effect may still be increased. Object of the present invention was to overcome the above mentioned problems.

The object was solved by a composition comprising an alkali metal salt of dicamba and an alkali metal salt of glyphosate. In another form the object was solved by a liquid aqueous composition, which has a pH value of at least 7,0, comprising a pesticide and a base selected from an alkali

salt of hydrogencarbonate. In another form the object was solved by a liquid aqueous composition which has a pH value of higher than 8,0 comprising an alkali metal salt of dicamba, an alkali metal salt of glyphosate, and a base.

- 5 The composition may be a solid or liquid composition, wherein a liquid composition is preferred. The composition is preferably a liquid **aqueous** composition. Usually, the composition is liquid at 20 °C.

- 10 The composition may comprise at least 10 wt%, preferably at least 25 wt% and in particular at least 40 wt% water. The water may be soft, medium or hard water. Preferably it is medium or hard water. Usually, the water has a **hardness** of at least 5 °dH, preferably at least 10 °dH, more preferably at least 15 °dH, and in particular at least 20 °dH (German degrees of hardness). In another form the water contains at least 0,1 mmol/l, preferably at least 1,0 mmol/l, more preferably at least 2,0 mmol/l, even more preferably at least 3,0 mmol/l, and in particular at least 3,5
15 mmol/l of the sum of calcium ions and magnesium ions.

- The liquid aqueous composition may have a **pH value** of at least pH 4,0, preferably of at least 6,0, better of at least 7,0, more preferably of at least 7,5, especially preferred of at least 8,0 and in particular of at least 8,5. The liquid aqueous composition may have a pH of up to 13,0, preferably of up to 11,0 and in particular of up to 9,0. The pH value is usually determined at 20 °C.
20

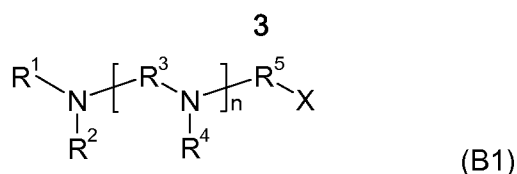
- The composition according to the invention may comprise a **base**, e.g. in order to adjust the pH value, and which is also suitable as further base. Typically, the base contains at least one organic amine and/or an inorganic base. In a preferred form, the base contains an organic amine.
25 In another preferred form, the base contains an inorganic base.

- Examples for **organic amines** are monoamines, oligoamines, polyamines, or mixtures thereof. In a preferred form the base comprises a monoamine. In another preferred form the base comprises a oligoamine. In another preferred form the base comprises a polyamine.
30

- Monoamines** are compounds which comprise only one primary, secondary or tertiary amine group. Examples are triethanolamine. In a preferred form monoamines are alkoxylated alkylamines, such as linear or branched C₆₋₃₀ alkylamines, which are ethoxylated and/or propoxylated. Examples are tallow amine ethoxylated, 2-propylheptylamine ethoxylate, iso-C₉-alkylamine ethoxylate. Further examples are those listed in WO 2011/019652 (Monsanto), paragraph [0068] to [0084].
35

- Oligoamines** are compounds which comprise from two to nine primary, secondary and/or tertiary amine groups. Examples are ethylenediamine.
40

In an embodiment the oligoamine has the formula



wherein R¹, R², R⁴, R⁶, R⁷ are independently H or C₁-C₆-alkyl, which is optionally substituted with OH, R³ and R⁵ are independently C₂-C₁₀-alkylene, X is OH or NR⁶R⁷, and n is from 1 to 7.

R¹, R², R⁴, R⁶ and R⁷ are preferably independently H or methyl. Preferably, R¹, R², R⁶ and R⁷ are H. R⁶ and R⁷ are preferably identical to R¹ and R², respectively. R³ and R⁵ are preferably independently C₂-C₃-alkylene, such as ethylene (-CH₂CH₂-), or n-propylene (-CH₂CH₂CH₂-).

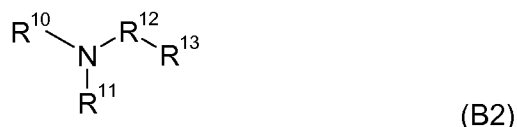
Typically, R³ and R⁵ are identical. R³ and R⁵ may be linear or branched, unsubstituted or substituted with halogen. Preferably, R³ and R⁵ are linear. Preferably, R³ and R⁵ are unsubstituted. X is preferably NR⁶R⁷. Preferably, n is from 1 to 5, more preferably from 1 to 4, especially from 1

to 3. Preferably, R¹, R², and R⁴ are independently H or methyl, R³ and R⁵ are independently C₂-C₃-alkylene, X is OH or NR⁶R⁷, and n is from 1 to 10.

The group X is bound to R⁵, which is a C₂-C₁₀-alkylene group. This means that X may be bound to any carbon atom of the C₂-C₁₀-alkylene group. Examples of a unit -R⁵-X are -CH₂-CH₂-CH₂-OH or -CH₂-CH(OH)-CH₃.

R¹, R², R⁴, R⁶, R⁷ are independently H or C₁-C₆-alkyl, which is optionally substituted with OH. Preferably, R¹, R², R⁴, R⁶, R⁷ are independently H or C₁-C₆-alkyl.

In another embodiment the oligoamine has the formula



wherein R¹⁰ and R¹¹ are independently H or C₁-C₆-alkyl, R¹² is C₂-C₁₂-alkylene, and R¹³ is an aliphatic C₅-C₈ ring system, which comprises either nitrogen in the ring or which is substituted with at least one unit NR¹⁰R¹¹.

R¹⁰ and R¹¹ are preferably independently H or methyl, more preferably H. Typically R¹⁰ and R¹¹ are linear or branched, unsubstituted or substituted with halogen. Preferably, R¹⁰ and R¹¹ are unsubstituted and linear. More preferably, R¹⁰ and R¹¹ are identical.

R¹² is preferably C₂-C₄-alkylene, such as ethylene (-CH₂CH₂-), or n-propylene (-CH₂CH₂CH₂-). R¹² may be linear or branched, preferably it is linear. R¹² may be unsubstituted or substituted with halogen, preferably it is unsubstituted.

R¹³ is an aliphatic C₅-C₈ ring system, which comprises either nitrogen in the ring or which is substituted with at least one unit NR¹⁰R¹¹. Preferably, R¹³ is an aliphatic C₅-C₈ ring system, which comprises nitrogen in the ring. The C₅-C₈ ring system may be unsubstituted or substituted with at least one C₁-C₆ alkyl group or at least one halogen. Preferably, the C₅-C₈ ring system is un-

substituted or substituted with at least one C₁-C₄ alkyl group. Examples for an aliphatic C₅-C₈ ring system, which comprises nitrogen in the ring, are piperazyl groups.

5 More preferably, R¹⁰ and R¹¹ are independently H or methyl, R¹² is C₂-C₃-alkylene, and R¹³ is an aliphatic C₅-C₈ ring system, which comprises oxygen or nitrogen in the ring. In another preferred embodiment the cationic polymer of the formula (B2) is free of ether groups (-O-).

10 In one preferred form **oligoamines** are oligoamine which are chelating bases. Suitable **chelating bases** ethylenediaminetetraacetic acid (EDTA), methylglycine diacetic acid (MGA), ethylene glycol tetraacetic acid (EGTA), 1,2-bis(o-aminophenoxy)ethane- N,N',N'-tetraacetic acid (BAP-TA).

15 **Polyamines** are compounds which comprise at least ten primary, secondary and/or tertiary amine groups. Suitable polyamines are those listed in WO 2011/019652 (Monsanto), paragraph [0045] to [0064].

20 Examples for **inorganic bases** are a carbonate, a phosphate, a hydroxide, a silicate, a borate, an oxide, or mixtures thereof. In a preferred form the base comprises a carbonate. In another preferred form the base comprises a phosphate. In another preferred form the base comprises a hydroxide. In another preferred form the base comprises an oxide. In another preferred form the base comprises a borate. In another preferred form the base comprises a silicate.

Suitable **carbonates** are alkali or earth alkaline salts of CO₃⁻ or of HCO₃⁻ (Hydrogencarbonates).

25 Preferred **carbonates** are sodium carbonate or potassium carbonate, wherein the latter is preferred. The carbonate may be present in any crystall modification, in pure form, as technical quality, or as hydrates (e.g. K₂CO₃ x 1,5 H₂O).

30 Suitable **phosphates** are alkaline or earth alkaline salts of secondary or tertiary phosphates, pyrophosphates, and oligophosphates. Potassium salts of phosphates are preferred, such as Na₃PO₄, Na₂HPO₄, and NaH₂PO₄, and mixtures thereof.

35 Suitable **hydroxides** are alkaline, earth alkaline, or organic salts of hydroxides. Preferred hydroxides are NaOH, KOH and choline hydroxide, wherein KOH and choline hydroxide are preferred.

Suitable **silicates** are alkaline or earth alkaline silicates, such as potassium silicates.

40 Suitable **borates** are alkaline or earth alkaline borates, such as potassium, sodium or calcium borates. Fertilizers containing borates are also suitable.

Suitable **oxides** are alkaline or earth alkaline oxides, such as calcium oxide or magnesium oxide. In a preferred form oxides are used together with chelating bases.

The liquid aqueous composition, which has a pH value of at least 7,0 comprises a pesticide and a base selected from an **alkali salt of hydrogencarbonate**. Alkali salts refer to salts containing preferably sodium and/or potassium as cations. Preferred alkali salt of hydrogencarbonate is sodium hydrogencarbonate and/or potassium hydrogencarbonate, wherein the latter is preferred.

The liquid aqueous composition, which has a pH value of at least 7,0 and which comprises a pesticide and a base selected from an alkali salt of hydrogencarbonate may additionally comprise a **further base** beside the alkali salt of hydrogencarbonate. The further base may be selected from above listed bases. Preferred further bases contain an inorganic base, wherein carbonates and/or phosphates are more preferred. An especially preferred further base is selected from an alkali metal salt of carbonate, such as potassium carbonate, sodium carbonate, and mixtures thereof. The further base has preferably has a solubility in water of at least 1 g/l at 20 °C, more preferably of at least 10 g/l, and in particular at least 100 g/l.

In a preferred form the composition comprises a base selected from an alkali salt of hydrogencarbonate and a further base selected from an alkali metal salt of carbonate, such as potassium carbonate and potassium hydrogencarbonate; or sodium carbonate and sodium hydrogencarbonate. The weight ratio of alkali salts of CO_3^{2-} (e.g. K_2CO_3) to alkali salts of HCO_3^- (e.g. KHCO_3) may be in the range of 1:20 to 20:1, preferably 1:10 to 10:1. In another form, the weight ratio of alkali salts of CO_3^{2-} (e.g. K_2CO_3) to alkali salts of HCO_3^- (e.g. KHCO_3) may be in the range of 1:1 to 1:25, preferably of 1:2 to 1:18, and in particular of 1:4 to 1:14.

The base and the further base may be present in dispersed or **dissolved** form, wherein the dissolved form is preferred.

The base and the further base has preferably has a **solubility** in water of at least 1 g/l at 20 °C, more preferably of at least 10 g/l, and in particular at least 100 g/l.

Usually, the **amount** of the base depends on the desired pH value. First, the desired pH may be selected and then the required amount of base is added while controlling the pH value of the composition.

The composition may contain at least 1 wt%, preferably at least 5 wt%, even more preferably at least 10 wt%, in particular at least 20 wt%, and most preferably at least 30 wt% of the base.

The **molar ratio** of the base to the pesticide may be from 30 : 1 to 1 : 10, preferably from 10 : 1 to 1 : 5, and in particular from 5 : 1 to 1 : 1. For calculation of the molar ratio, the sum of all ba-

ses (e.g. HCO_3^-) except the further base may be applied. For calculation of the molar ratio, the sum of all pesticides (preferably of all anionic pesticides) may be applied.

The **molar ratio** of the carbonate bases (i.e. CO_3^{2-} and HCO_3^-) to the pesticide may be from 30 : 1 to 1 : 10, preferably from 10 : 1 to 1 : 5, and in particular from 5 : 1 to 1 : 1. For calculation of the molar ratio, the sum of all carbonate bases (i.e. CO_3^{2-} and HCO_3^-) except the further base may be applied.

The composition may comprise **further pesticides** (e.g. one or two further pesticides) beside the pesticide (i.e. the tank mix may comprise more than one pesticide). The further pesticides may be selected from the following list of pesticides.

The term "**pesticide**" within the meaning of the invention states that one or more compounds can be selected from the group consisting of fungicides, insecticides, nematocides, herbicide and/or safener or growth regulator, preferably from the group consisting of fungicides, insecticides or herbicides, most preferably from the group consisting of herbicides. Also mixtures of pesticides of two or more the aforementioned classes can be used. The skilled artisan is familiar with such pesticides, which can be, for example, found in the Pesticide Manual, 15th Ed. (2009), The British Crop Protection Council, London.

Examples for fungicides are:

A) strobilurins

azoxystrobin, dimoxystrobin, enestroburin, fluoxastrobin, kresoxim-methyl, metominostrobin, orysastrobin, picoxystrobin, pyraclostrobin, pyrametostrobin, pyraoxystrobin, pyribencarb, trifloxystrobin, methyl (2-chloro-5-[1-(3-methylbenzyloxyimino)ethyl]benzyl)carbamate and 2-(2-(3-(2,6-dichlorophenyl)-1-methyl-allylideneaminooxymethyl)-phenyl)-2-methoxyimino-N-methyl-acetamide;

B) carboxamides

- carboxanilides: benalaxyl, benalaxyl-M, benodanil, bixafen, boscalid, carboxin, fenfuram, fenhexamid, flutolanil, furametpyr, isopyrazam, isotianil, kiralaxyl, mepronil, metalaxyl, metalaxyl-M (mefenoxam), ofurace, oxadixyl, oxycarboxin, penflufen, penthiopyrad, sedaxane, tecloftalam, thifluzamide, tiadinil, 2-amino-4-methyl-thiazole-5-carboxanilide, N-(3',4',5'-trifluorobiphenyl-2-yl)-3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxamide, N-(4'-trifluoromethylthiobiphenyl-2-yl)-3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxamide and N-(2-(1,3,3-trimethyl-butyl)-phenyl)-1,3-dimethyl-5-fluoro-1H-pyrazole-4-carboxamide;
- carboxylic morpholides: dimethomorph, flumorph, pyrimorph;
- benzoic acid amides: flumetover, fluopicolide, fluopyram, zoxamide;
- other carboxamides: carpropamid, dicyclomet, mandiproamid, oxytetracyclin, silthiofarm and N-(6-methoxy-pyridin-3-yl) cyclopropanecarboxylic acid amide;

C) azoles

- triazoles: azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol,

hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, oxpoconazole, paclobutrazole, penconazole, propiconazole, prothioconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, uniconazole;

- imidazoles: cyazofamid, imazalil, pefurazoate, prochloraz, triflumizol;

5 - benzimidazoles: benomyl, carbendazim, fuberidazole, thiabendazole;

- others: ethaboxam, etridiazole, hymexazole and 2-(4-chloro-phenyl)-N-[4-(3,4-dimethoxy-phenyl)-isoxazol-5-yl]-2-prop-2-ynyloxy-acetamide;

D) heterocyclic compounds

- pyridines: fluazinam, pyrifenox, 3-[5-(4-chloro-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-

10 pyridine, 3-[5-(4-methyl-phenyl)-2,3-dimethyl-isoxazolidin-3-yl]-pyridine;

- pyrimidines: bupirimate, cyprodinil, diflumetorim, fenarimol, ferimzone, mepanipyrim, nitrapyrin, nuarimol, pyrimethanil;

- piperazines: triforine;

- pyrroles: fenpiclonil, fludioxonil;

15 - morpholines: aldimorph, dodemorph, dodemorph-acetate, fenpropimorph, tridemorph;

- piperidines: fenpropidin;

- dicarboximides: fluoroimid, iprodione, procymidone, vinclozolin;

- non-aromatic 5-membered heterocycles: famoxadone, fenamidone, flutianil, octhilinone, probenazole, 5-amino-2-isopropyl-3-oxo-4-ortho-tolyl-2,3-dihydro-pyrazole-1-carbothioic acid S-allyl ester;

20 - others: acibenzolar-S-methyl, ametoctradin, amisulbrom, anilazin, blasticidin-S, captafol, captan, chinomethionat, dazomet, debacarb, diclomezine, difenzoquat, difenzoquat-methyl-sulfate, fenoxanil, Folpet, oxolinic acid, piperalin, proquinazid, pyroquilon, quinoxifen, triazoxide, tricyclazole, 2-butoxy-6-iodo-3-propylchromen-4-one, 5-chloro-1-(4,6-dimethoxy-pyrimidin-2-yl)-2-methyl-1H-benzoimidazole and 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine;

E) carbamates

- thio- and dithiocarbamates: ferbam, mancozeb, maneb, metam, methasulphocarb, metiram, propineb, thiram, zineb, ziram;

30 - carbamates: benthiavalicarb, diethofencarb, iprovalicarb, propamocarb, propamocarb hydrochlorid, valifenalate and N-(1-(1-(4-cyano-phenyl)ethanesulfonyl)-but-2-yl) carbamic acid-(4-fluorophenyl) ester;

F) other active substances

- guanidines: guanidine, dodine, dodine free base, guazatine, guazatine-acetate, iminoctadine, iminoctadine-triacetate, iminoctadine-tris(albesilate);

35 - antibiotics: kasugamycin, kasugamycin hydrochloride-hydrate, streptomycin, polyoxine, validamycin A;

- nitrophenyl derivates: binapacryl, dinobuton, dinocap, nitrthal-isopropyl, tecnazen,

organometal compounds: fentin salts, such as fentin-acetate, fentin chloride or fentin hydroxide;

40 - sulfur-containing heterocyclyl compounds: dithianon, isoprothiolane;

- organophosphorus compounds: edifenphos, fosetyl, fosetyl-aluminum, iprobenfos, phospho-

rous acid and its salts, pyrazophos, tolclofos-methyl;

- organochlorine compounds: chlorothalonil, dichlofluanid, dichlorophen, flusulfamide, hexachlorobenzene, pencycuron, pentachlorophenole and its salts, phthalide, quintozone, thiophanate-methyl, tolylfluanid, N-(4-chloro-2-nitro-phenyl)-N-ethyl-4-methylbenzenesulfonamide;
- inorganic active substances: Bordeaux mixture, copper acetate, copper hydroxide, copper oxychloride, basic copper sulfate, sulfur;
- others: biphenyl, bronopol, cyflufenamid, cymoxanil, diphenylamin, metrafenone, mildiomicin, oxin-copper, prohexadione-calcium, spiroxamine, tebufloquin, tolylfluanid, N-(cyclopropylmethoxyimino-(6-difluoro-methoxy-2,3-difluoro-phenyl)-methyl)-2-phenyl acetamide, N'-(4-(4-chloro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methylformamidine, N'-(4-(4-fluoro-3-trifluoromethyl-phenoxy)-2,5-dimethyl-phenyl)-N-ethyl-N-methylformamidine, N'-(2-methyl-5-trifluoromethyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methylformamidine, N'-(5-difluoromethyl-2-methyl-4-(3-trimethylsilanyl-propoxy)-phenyl)-N-ethyl-N-methylformamidine, 2-{1-[2-(5-methyl-3-trifluoromethyl-pyrazole-1-yl)-acetyl]-piperidin-4-yl}-thiazole-4-carboxylic acid methyl-(1,2,3,4-tetrahydro-naphthalen-1-yl)-amide, 2-{1-[2-(5-methyl-3-trifluoromethyl-pyrazole-1-yl)-acetyl]-piperidin-4-yl}-thiazole-4-carboxylic acid methyl-(R)-1,2,3,4-tetrahydro-naphthalen-1-yl-amide, methoxy-acetic acid 6-tert-butyl-8-fluoro-2,3-dimethyl-quinolin-4-yl ester and N-Methyl-2-{1-[(5-methyl-3-trifluoromethyl-1H-pyrazol-1-yl)-acetyl]-piperidin-4-yl}-N-[(1R)-1,2,3,4-tetrahydronaphthalen-1-yl]-4-thiazolecarboxamide.

Examples for growth regulators are:

Absciscic acid, amidochlor, ancymidol, 6-benzylaminopurine, brassinolide, butralin, chlormequat (chlormequat chloride), choline chloride, cyclanilide, daminozide, dikegulac, dimethipin, 2,6-dimethylpuridine, ethephon, flumetralin, flurprimidol, fluthiacet, forchlorfenuron, gibberellic acid, inabenfide, indole-3-acetic acid, maleic hydrazide, mefluidide, mepiquat (mepiquat chloride), naphthaleneacetic acid, N-6-benzyladenine, paclobutrazol, prohexadione (prohexadione-calcium), prohydrojasmon, thidiazuron, triapenthenol, tributyl phosphorotriethioate, 2,3,5-tri-iodobenzoic acid, trinexapac-ethyl and uniconazole.

Examples for herbicides are:

- acetamides: acetochlor, alachlor, butachlor, dimethachlor, dimethenamid, flufenacet, mefenacet, metolachlor, metazachlor, napropamide, naproanilide, pethoxamid, pretilachlor, propachlor, thenylchlor;
- amino acid derivatives: bilanafos, glyphosate (e.g. glyphosate free acid, glyphosate ammonium salt, glyphosate isopropylammonium salt, glyphosate trimethylsulfonium salt, glyphosate potassium salt, glyphosate dimethylamine salt), glufosinate, sulfosate;
- aryloxyphenoxypropionates: clodinafop, cyhalofop-butyl, fenoxaprop, fluazifop, haloxyfop, metamifop, propaquizafop, quizalofop, quizalofop-P-tefuryl;
- Bipyridyls: diquat, paraquat;
- (thio)carbamates: asulam, butylate, carbetamide, desmedipham, dimepiperate, eptam

- (EPTC), esprocarb, molinate, orbencarb, phenmedipham, prosulfocarb, pyributicarb, thio-bencarb, triallate;
- cyclohexanediones: butroxydim, clethodim, cycloxydim, profoxydim, sethoxydim, tepralox-
ydim, tralkoxydim;
 - 5 - dinitroanilines: benfluralin, ethalfluralin, oryzalin, pendimethalin, prodiamine, trifluralin;
 - diphenyl ethers: acifluorfen, aclonifen, bifenox, diclofop, ethoxyfen, fomesafen, lactofen, ox-
yfluorfen;
 - hydroxybenzonitriles: bomoxynil, dichlobenil, ioxynil;
 - imidazolinones: imazamethabenz, imazamox, imazapic, imazapyr, imazaquin, imazethapyr;
 - 10 - phenoxy acetic acids: clomeprop, 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4-DB, dichlor-
prop, MCPA, MCPA-thioethyl, MCPB, Mecoprop;
 - pyrazines: chloridazon, flufenpyr-ethyl, fluthiacet, norflurazon, pyridate;
 - pyridines: aminopyralid, clopyralid, diflufenican, dithiopyr, fluridone, fluroxypyr, picloram,
picolinafen, thiazopyr;
 - 15 - sulfonyl ureas: amidosulfuron, azimsulfuron, bensulfuron, chlorimuron-ethyl, chlorsulfuron,
cinosulfuron, cyclosulfamuron, ethoxysulfuron, flazasulfuron, flucetosulfuron, flupyrsulfuron,
foramsulfuron, halosulfuron, imazosulfuron, iodosulfuron, mesosulfuron, metazosulfuron,
metsulfuron-methyl, nicosulfuron, oxasulfuron, primisulfuron, prosulfuron, pyrazosulfuron,
rimsulfuron, sulfometuron, sulfosulfuron, thifensulfuron, triasulfuron, tribenuron, trifloxysulfu-
20 ron, triflusulfuron, tritosulfuron, 1-((2-chloro-6-propyl-imidazo[1,2-b]pyridazin-3-yl)sulfonyl)-3-
(4,6-dimethoxy-pyrimidin-2-yl)urea;
 - triazines: ametryn, atrazine, cyanazine, dimethametryn, ethiozin, hexazinone, metamitron,
metribuzin, prometryn, simazine, terbutylazine, terbutryn, triaziflam;
 - ureas: chlorotoluron, daimuron, diuron, fluometuron, isoproturon, linuron, metha-
25 benzthiazuron, tebuthiuron;
 - other acetolactate synthase inhibitors: bispyribac-sodium, cloransulam-methyl, diclosulam,
florasulam, flucarbazone, flumetsulam, metosulam, ortho-sulfamuron, penoxsulam,
propoxycarbazone, pyribambenz-propyl, pyribenzoxim, pyriftalid, pyriminobac-methyl, pyrim-
isulfan, pyriithiobac, pyroxasulfone, pyroxsulam;
 - 30 - others: amicarbazone, aminotriazole, anilofos, beflubutamid, benazolin, bencarba-
zone, benfluresate, benzofenap, bentazone, benzobicyclon, bicyclopypyrone, bromacil, bromo-
butide, butafenacil, butamifos, cafenstrole, carfentrazone, cinidon-ethyl, chlorthal, cinme-
thylin, clomazone, cumyluron, cyprosulfamide, dicamba, difenzoquat, diflufenzopyr,
Drechslera monoceras, endothal, ethofumesate, etobenzanid, fenoxasulfone, fentrazamide,
35 flumiclorac-pentyl, flumioxazin, flupoxam, flurochloridone, flurtamone, indanofan, isoxaben,
isoxaflutole, lenacil, propanil, propyzamide, quinclorac, quinmerac, mesotrione, methyl ar-
sonic acid, naptalam, oxadiargyl, oxadiazon, oxaziclomefone, pentoxazone, pinoxaden, py-
raclonil, pyraflufen-ethyl, pyrasulfotole, pyrazoxyfen, pyrazolynate, quinoclamine,
saflufenacil, sulcotrione, sulfentrazone, terbacil, tefuryltrione, tembotrione, thienicarbazone,
40 topramezone, (3-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-trifluoromethyl-3,6-dihydro-2H-
pyrimidin-1-yl)-phenoxy]-pyridin-2-yloxy)-acetic acid ethyl ester, 6-amino-5-chloro-2-
cyclopropyl-pyrimidine-4-carboxylic acid methyl ester, 6-chloro-3-(2-cyclopropyl-6-methyl-

phenoxy)-pyridazin-4-ol, 4-amino-3-chloro-6-(4-chloro-phenyl)-5-fluoro-pyridine-2-carboxylic acid, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxy-phenyl)-pyridine-2-carboxylic acid methyl ester, and 4-amino-3-chloro-6-(4-chloro-3-dimethylamino-2-fluoro-phenyl)-pyridine-2-carboxylic acid methyl ester.

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Examples for insecticides are:

- organo(thio)phosphates: acephate, azamethiphos, azinphos-methyl, chlorpyrifos, chlorpyrifos-methyl, chlorfenvinphos, diazinon, dichlorvos, dicrotophos, dimethoate, disulfoton, ethion, fenitrothion, fenthion, isoxathion, malathion, methamidophos, methidathion, methylparathion, mevinphos, monocrotophos, oxydemeton-methyl, paraoxon, parathion, phenthoate, phosalone, phosmet, phosphamidon, phorate, phoxim, pirimiphos-methyl, profenofos, prothiofos, sulprophos, tetrachlorvinphos, terbufos, triazophos, trichlorfon;
- carbamates: alanycarb, aldicarb, bendiocarb, benfuracarb, carbaryl, carbofuran, carbosulfan, fenoxycarb, furathiocarb, methiocarb, methomyl, oxamyl, pirimicarb, propoxur, thiodicarb, triazamate;
- pyrethroids: allethrin, bifenthrin, cyfluthrin, cyhalothrin, cyphenothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, zeta-cypermethrin, deltamethrin, esfenvalerate, etofenprox, fenpropathrin, fenvalerate, imiprothrin, lambda-cyhalothrin, permethrin, prallethrin, pyrethrin I and II, resmethrin, silafluofen, tau-fluvalinate, tefluthrin, tetramethrin, tralomethrin, transfluthrin, profluthrin, dimefluthrin;
- insect growth regulators: a) chitin synthesis inhibitors: benzoylureas: chlorfluazuron, cyramazin, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, teflubenzuron, triflumuron; buprofezin, diofenolan, hexythiazox, etoxazole, clofentazine; b) ecdysone antagonists: halofenozide, methoxyfenozide, tebufenozide, azadirachtin; c) juvenoids: pyriproxyfen, methoprene, fenoxycarb; d) lipid biosynthesis inhibitors: spirotetramat, spiromesifen, spirotetramat;
- nicotinic receptor agonists/antagonists compounds: clothianidin, dinotefuran, imidacloprid, thiamethoxam, nitenpyram, acetamiprid, thiacloprid, 1-(2-chloro-thiazol-5-ylmethyl)-2-nitrimino-3,5-dimethyl-[1,3,5]triazinane;
- GABA antagonist compounds: endosulfan, ethiprole, fipronil, vaniliprole, pyrafluprole, pyriprole, 5-amino-1-(2,6-dichloro-4-methyl-phenyl)-4-sulfamoyl-1H-pyrazole-3-carbothioic acid amide;
- macrocyclic lactone insecticides: abamectin, emamectin, milbemectin, lepimectin, spinosad, spinetoram;
- mitochondrial electron transport inhibitor (METI) I acaricides: fenazaquin, pyridaben, tebufenpyrad, tolfenpyrad, flufenimer;
- METI II and III compounds: acequinocyl, fluacyprim, hydramethylnon;
- Uncouplers: chlorfenapyr;
- oxidative phosphorylation inhibitors: cyhexatin, diafenthiuron, fenbutatin oxide, propargite;
- moulting disruptor compounds: cryomazine;
- mixed function oxidase inhibitors: piperonyl butoxide;
- sodium channel blockers: indoxacarb, metaflumizone;

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- others: benclothiaz, bifenazate, cartap, flonicamid, pyridalyl, pymetrozine, sulfur, thiocyclam, flubendiamide, chlorantraniliprole, cyazypyr (HGW86), cyenopyrafen, flupyrazofos, cyflumetofen, amidoflumet, imicyafos, bistrifluron, and pyrifluquinazon.

- 5 The pesticide or the further pesticide has often a **solubility** in water at 20 °C of at least 10 g/l, preferably of at least 50 g/l, and in particular of at least 100 g/l.

The pesticide or the further pesticide may be present in solid or dissolved form, wherein the latter is preferred.

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Preferred pesticides or further pesticides are herbicides, such as organophosphorus herbicides comprising a carboxylic acid group. The term "organophosphorous herbicides" usually refers to herbicides containing a phosphinic or phosphorous acid group. Suitable organophosphorous herbicides comprising a carboxylic acid group are bialafos, glufosinate, glufosinate-P, glypho-

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Especially preferred further pesticides are bialafos, glufosinate, glufosinate-P, and one or more pesticides from the class of imidazolinones.

- 20 In another preferred form the pesticide comprises a **growth regulator**, such as prohexadione (especially prohexadione calcium).

In another preferred form the pesticide comprises an alkali metal salt of dicamba and an alkali metal salt of glyphosate.

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Examples for **alkali metal salts of dicamba** are sodium, potassium, caesium, and/or lithium salts of dicamba. It is also possible to use mixed salts, such as sodium and potassium salt of dicamba. Preferred alkali metal salts of dicamba are sodium and/or potassium salts of dicamba. In a more preferred form alkali metal salts of dicamba are sodium salts of dicamba. In another more preferred form alkali metal salts of dicamba are potassium salts of dicamba.

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Examples for **alkali metal salts of glyphosate** are sodium, potassium, caesium and/or lithium salts of glyphosate. It is also possible to use mixed salts, such as sodium and potassium salt of glyphosate. A suitable sodium salt of glyphosate is glyphosate sesquisodium. In a more preferred form alkali metal salts of glyphosate are sodium salts of glyphosate. In another more preferred form alkali metal salts of glyphosate are potassium salts of glyphosate.

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The alkali metal salts of glyphosate may contain from one to three (e.g. one, two or three) alkali metal ions, or a mixture thereof. Preferably, the alkali metal salts of glyphosate contains at least 2 equivalents (in particular two or three equivalents, or a mixture thereof) of alkali metal ions per glyphosate ion. Examples are monosodium glyphosate, monopotassium glyphosate, disodium glyphosate, trisodium glyphosate, dipotassium glyphosate, tripotassium glyphosate, or

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mixtures thereof. Preferred are disodium glyphosate, trisodium glyphosate, dipotassium glyphosate, tripotassium glyphosate, or mixtures thereof (e.g. a mixture of disodium glyphosate and trisodium glyphosate; or of dipotassium glyphosate and tripotassium glyphosate; or of dipotassium glyphosate, trisodium glyphosate; or of disodium glyphosate and tripotassium glyphosate).

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The alkali metal salt of dicamba and the alkali metal salt of glyphosate may contain the same, partly **the same or different alkali metals**. Preferably, the alkali metal salt of dicamba and the alkali metal salt of glyphosate contain the same alkali metal.

- 10 Preferably, the alkali metal salt of dicamba is a sodium and/or potassium salt of dicamba and the alkali metal salt of glyphosate is a sodium and/or potassium salt of glyphosate. In a more preferred form the alkali metal salt of dicamba is a sodium salt of dicamba and the alkali metal salt of glyphosate is a sodium salt of glyphosate (e.g. di-, or trisodium glyphosate, or a mixture thereof). In another more preferred form the alkali metal salt of dicamba is a sodium salt of dicamba and the alkali metal salt of glyphosate is a potassium salt of glyphosate (e.g. di-, or tripotassium glyphosate, or a mixture thereof). In another more preferred form the alkali metal salt of dicamba is a potassium salt of dicamba and the alkali metal salt of glyphosate is a potassium salt of glyphosate (e.g. di-, or tripotassium glyphosate, or a mixture thereof). In another more preferred form the alkali metal salt of dicamba is a potassium salt of dicamba and the alkali metal salt of glyphosate is a sodium salt of glyphosate (e.g. di-, or trisodium glyphosate, or a mixture thereof).
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The alkali metal salt of dicamba and the alkali metal salt of glyphosate may be present in dissolved form in water, or in solid state. Preferably, the alkali metal salt of dicamba and the alkali metal salt of glyphosate are present in dissolved form in water.

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The composition may comprise the alkali metal salt of dicamba and the alkali metal salt of glyphosate in a **total amount** of at least 1 wt%, preferably at least 10 wt%, and in particular at least 30 wt%. The composition may comprise the alkali metal salt of dicamba and the alkali metal salt of glyphosate in a total amount of up to 100 wt%, preferably up to 90 wt%, and in particular up to 70 wt%.

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The **molar ratio** of dicamba anion to glyphosate anion may vary from 1000 / 1 to 1 / 1000, preferably from 100 / 1 to 1 / 100, and in particular vary from 10 / 1 to 1 / 10.

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The composition may comprise **other cations**. Other cations are usually cations, which are different from an alkali metal cation or a hydrogen cation. Examples of other cations are protonated organic amines, such as dimethyl amine, isopropylamine, and/or ethanol amine, each in the protonated form. Usually, the **molar excess of alkali metal cations** to the other cations is at least 1,2-fold, preferably at least 2-fold, more preferably at least 5-fold, even more preferably at least 20-fold, and in particular at least 100-fold. For example, a molar excess of 1,2-fold means that 1,2 mol/l of the alkali metal cations and 1,0 mol/l of the other cations are present.

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The composition may be free of **cationic compounds, which can dissociate into a proton and an amine, and which have a low vapor pressure** (e.g. organic amines like dimethyl amine, isopropylamine, ethanol amine). The vapor pressure at 20 °C is usually up to 10 mbar, preferably up to 1 mbar, more preferably up to 0,1 mbar and in particular up to 0,01 mbar. Usually, the composition comprises less than 1 wt%, preferably less than 0,1 %, and more preferably less than 0,01 wt% cationic compounds, which can dissociate into a proton and an amine and which have a low vapor pressure. In particular, the composition is free of cationic compounds, which can dissociate into a proton and an amine and which have a low vapor pressure.

The composition may be free of **cationic compounds, which can dissociate into a proton and an amine, and which have a low boiling point** (e.g. organic amines like dimethyl amine, isopropylamine, ethanol amine). The boiling point (or where applicable the onset of boiling) at 1013 mbar is usually up to 150 °C, preferably up to 200 °C, and in particular up to 250 °C. Usually, the composition comprises less than 1 wt%, preferably less than 0,1 %, and more preferably less than 0,01 wt% cationic compounds, which can dissociate into a proton and an amine and which have a low boiling point. In particular, the composition is free of cationic compounds, which can dissociate into a proton and an amine and which have a low boiling point.

The composition may be free of **cationic compounds, which can dissociate into a proton and an amine, and which have a low flash point** (e.g. organic amines like dimethyl amine, isopropylamine, ethanol amine). The flash point (may be determined according to DIN51758) is usually up to 100 °C, preferably up to 130 °C, and in particular up to 150 °C. Usually, the composition comprises less than 1 wt%, preferably less than 0,1 %, and more preferably less than 0,01 wt% cationic compounds, which can dissociate into a proton and an amine and which have a low flash point. In particular, the composition is free of cationic compounds, which can dissociate into a proton and an amine and which have a low flash point.

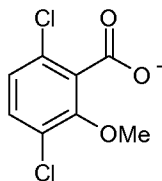
In another preferred form the pesticide contains an auxin herbicide. Various synthetic and natural **auxin herbicides** are known, wherein synthetic auxin herbicides are preferred. Preferably, the auxin herbicide comprises a protonizable hydrogen. More preferably, auxin herbicides relate to pesticides comprising a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic or phosphorous acid group, especially a carboxylic acid group. The aforementioned groups may be partly present in neutral form including the protonizable hydrogen. Examples for natural auxin herbicides are indole-3-acetic acid (IAA), phenyl acetic acid (PAA), 4-chloroindole-3-acetic acid (4-Cl-IAA), and indole-3-butanoic acid (IBA). Examples for synthetic auxin herbicides are 2,4-D and its salts, 2,4-DB and its salts, aminopyralid and its salts such as aminopyralid-tris(2-hydroxypropyl)-ammonium, benazolin, chloramben and its salts, clomeprop, clopyralid and its salts, dicamba and its, dichlorprop and its salts, dichlorprop-P and its salts, fluroxypyr, MCPA and its salts, MCPA-thioethyl, MCPB and its salts, mecoprop and its salts, mecoprop-P and its salts, picloram and its salts, quinclorac, quinmerac, TBA (2,3,6) and its salts, triclopyr and its salts, and aminocyclopyrachlor and its salts. Preferred auxin herbicides are 2,4-D and its salts, and dicamba and

its salts, wherein dicamba is more preferred. In another more preferred form, the auxin herbicide contains an alkali metal salt of dicamba, such as sodium and/or potassium. Mixtures of the aforementioned auxin herbicides are also possible.

- 5 In another preferred form the pesticide contains a anionic pesticide. The term "**anionic pesticide**" refers to a pesticide, which is present as an anion. Preferably, anionic pesticides relate to pesticides comprising a protonizable hydrogen. More preferably, anionic pesticides relate to pesticides comprising a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic, phosphinic, or phosphorous acid group, especially a carboxylic acid group. The aforementioned groups may be partly present in neutral form including the protonizable hydrogen.

- Usually, anions such as anionic pesticides comprise at least one anionic group. Preferably, the anionic pesticide comprises one or two anionic groups. In particular the anionic pesticide comprises exactly one anionic group. An example of an anionic group is a carboxylate group (-C(O)O⁻). The aforementioned anionic groups may be partly present in neutral form including the protonizable hydrogen. For example, the carboxylate group may be present partly in neutral form of carboxylic acid (-C(O)OH). This is preferably the case in aqueous compositions, in which an equilibrium of carboxylate and carboxylic acid may be present.

- 20 Suitable anionic pesticides are given in the following. In case the names refer to a neutral form or a salt of the anionic pesticide, the anionic form of the anionic pesticides are meant. For example, the anionic form of dicamba may be represented by the following formula:



- As another example, the anionic form of glyphosate may be a contain one, two, three, or a mixture thereof, negative charges.

- It is known to an expert, that the dissociation of the functional groups and thus the location of the anionic charge may depend for example on the pH, when the anionic pesticides is present in dissolved form. The acid dissociation constants pK_a of glyphosate are typically 0.8 for the first phosphonic acid, 2.3 for the carboxylic acid, 6.0 for the second phosphonic acid, and 11.0 for the amine.

- Suitable anionic pesticides are **herbicides**, which comprise a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic or phosphorous acid group, especially a carboxylic acid group. Examples are aromatic acid herbicides, phenoxycarboxylic acid herbicides or organophosphorous herbicides comprising a carboxylic acid group.

Suitable aromatic acid herbicides are benzoic acid herbicides, such as diflufenzopyr, naptalam, chloramben, dicamba, 2,3,6-trichlorobenzoic acid (2,3,6-TBA), tricamba; pyrimidinyloxybenzoic

acid herbicides, such as bispyribac, pyriminobac; pyrimidinylthiobenzoic acid herbicides, such as pyriithiobac; phthalic acid herbicides, such as chlorthal; picolinic acid herbicides, such as aminopyralid, clopyralid, picloram; quinolinecarboxylic acid herbicides, such as quinclorac, quinmerac; or other aromatic acid herbicides, such as aminocyclopyrachlor. Preferred are benzoic acid herbicides, especially dicamba.

Suitable phenoxy-carboxylic acid herbicides are phenoxyacetic herbicides, such as 4-chlorophenoxyacetic acid (4-CPA), (2,4-dichlorophenoxy)acetic acid (2,4-D), (3,4-dichlorophenoxy)acetic acid (3,4-DA), MCPA (4-(4-chloro-o-tolyloxy)butyric acid), MCPA-thioethyl, (2,4,5-trichlorophenoxy)acetic acid (2,4,5-T); phenoxybutyric herbicides, such as 4-CPB, 4-(2,4-dichlorophenoxy)butyric acid (2,4-DB), 4-(3,4-dichlorophenoxy)butyric acid (3,4-DB), 4-(4-chloro-o-tolyloxy)butyric acid (MCPB), 4-(2,4,5-trichlorophenoxy)butyric acid (2,4,5-TB); phenoxypropionic herbicides, such as cloprop, 2-(4-chlorophenoxy)propanoic acid (4-CPP), dichlorprop, dichlorprop-P, 4-(3,4-dichlorophenoxy)butyric acid (3,4-DP), fenoprop, mecoprop, mecoprop-P; aryloxyphenoxypropionic herbicides, such as chlorazifop, clodinafop, clofop, cyhalofop, diclofop, fenoxaprop, fenoxaprop-P, fenthiaprop, fluazifop, fluazifop-P, haloxyfop, haloxyfop-P, isoxapyrifop, metamifop, propaquizafop, quizalofop, quizalofop-P, trifop. Preferred are phenoxyacetic herbicides, especially 2,4-D.

The term "organophosphorous herbicides" usually refers to herbicides containing a phosphinic or phosphorous acid group. Suitable organophosphorous herbicides comprising a carboxylic acid group are bialafos, glufosinate, glufosinate-P, glyphosate. Preferred is glyphosate.

Suitable other herbicides comprising a carboxylic acid are pyridine herbicides comprising a carboxylic acid, such as fluroxypyr, triclopyr; triazolopyrimidine herbicides comprising a carboxylic acid, such as cloransulam; pyrimidinylsulfonylurea herbicides comprising a carboxylic acid, such as bensulfuron, chlorimuron, foramsulfuron, halosulfuron, mesosulfuron, primisulfuron, sulfometuron; imidazolinone herbicides, such as imazamethabenz, imazamethabenz, imazamox, imazapic, imazapyr, imazaquin and imazethapyr; triazolinone herbicides such as flucarbazone, propoxycarbazone and thienecarbazone; aromatic herbicides such as acifluorfen, bifenox, carfentrazone, flufenpyr, flumiclorac, fluoroglycofen, fluthiacet, lactofen, pyraflufen. Further on, chlorflurenol, dalapon, endothal, flamprop, flamprop-M, flupropanate, flurenol, oleic acid, pelargonic acid, TCA may be mentioned as other herbicides comprising a carboxylic acid.

Suitable anionic pesticides are **fungicides**, which comprise a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic or phosphorous acid group, especially a carboxylic acid group. Examples are polyoxin fungicides, such as polyoxorim.

Suitable anionic pesticides are **insecticides**, which comprise a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic or phosphorous acid group, especially a carboxylic acid group. Examples are thuringiensin.

Suitable anionic pesticides are **plant growth regulator**, which comprise a carboxylic, thiocarbonic, sulfonic, sulfinic, thiosulfonic or phosphorous acid group, especially a carboxylic acid group. Examples are 1-naphthylacetic acid, (2-naphthylthio)acetic acid, indol-3-ylacetic acid, 4-indol-3-ylbutyric acid, glyphosine, jasmonic acid, 2,3,5-triiodobenzoic acid, prohexadione, trinexapac, preferably prohexadione and trinexapac.

Preferred anionic pesticides are anionic herbicides, more preferably dicamba, glyphosate, 2,4-D, aminopyralid, aminocyclopyrachlor and MCPA. Especially preferred are dicamba and glyphosate. In another preferred embodiment, dicamba is preferred. In another preferred embodiment, 2,4-D is preferred. In another preferred embodiment, glyphosate is preferred. In another preferred embodiment, MCPA is preferred.

The composition may contain at least 1 wt%, preferably at least 5 wt%, more preferably at least 10 wt%, and in particular at least 20 wt% of the pesticide (e.g. in dissolved form). Preferably, the composition is present in form of a agrochemical composition.

The composition according to the invention can be converted into customary **types of agrochemical compositions**. Examples for composition types are suspensions (e.g. SC, OD, FS), emulsifiable concentrates (e.g. EC), emulsions (e.g. EW, EO, ES, ME), capsules (e.g. CS, ZC), pastes, pastilles, wettable powders or dusts (e.g. WP, SP, WS, DP, DS), pressings (e.g. BR, TB, DT), granules (e.g. WG, SG, GR, FG, GG, MG), solutions (e.g. SL). Further examples for compositions types are listed in the "Catalogue of pesticide formulation types and international coding system", Technical Monograph No 2, 6th Ed. May 2008, CropLife International. Preferably, the composition is an aqueous liquid formulation, such as an SL formulation.

The composition may also comprise **auxiliaries** which are customary in agrochemical compositions. Suitable **auxiliaries** are solvents, liquid carriers, solid carriers or fillers, surfactants, dispersants, emulsifiers, wetters, adjuvants, solubilizers, penetration enhancers, protective colloids, adhesion agents, thickeners, anti-drift agents, humectants, repellents, attractants, feeding stimulants, compatibilizers, bactericides, crystallization inhibitors, anti-freezing agents, anti-foaming agents, colorants, tackifiers and binders. Preferably, the composition contains an adjuvant. More preferably, the auxiliary comprises a surfactant, an anti-freezing agent, a crystallization inhibitor, an anti-drift agent, and/or an anti-foaming agent.

Suitable **solvents** and liquid carriers are water and organic solvents, such as mineral oil fractions of medium to high boiling point, e.g. kerosene, diesel oil; oils of vegetable or animal origin; aliphatic, cyclic and aromatic hydrocarbons, e.g. toluene, paraffin, tetrahydronaphthalene, alkylated naphthalenes; alcohols, e.g. ethanol, propanol, butanol, benzylalcohol, cyclohexanol; glycols; DMSO; ketones, e.g. cyclohexanone; esters, e.g. lactates, carbonates, fatty acid esters, gamma-butyrolactone; fatty acids; phosphonates; amines; amides, e.g. N-methylpyrrolidone, fatty acid dimethylamides; and mixtures thereof. Preferred solvent is water.

Suitable **crystallization inhibitors** are polyacrylic acids and their salts, whereas the latter are preferred. The salts of polyacrylic acids may be ammonium, primary, secondary or tertiary ammonium derivatives, or alkali metal salts (e.g. sodium, potassium, lithium ions), wherein alkali metal salts such as sodium salts are preferred. The polyacrylic acids and their salts usually have a molecular weight (as determined by GPC, calibration with polystyrene sulfonates) of 1000 Da to 300 kDa, preferably of 1000 Da to 80 kDa, and in particular 1000 Da to 15 kDa. The crystallization inhibitors are usually water-soluble, e.g. at least 1g/l, preferably at least 10 g/l, and in particular at least 100 g/l at 20 °C. The tank mix usually contains from 0,0001 to 0,2 wt%, preferably from 0,005 to 0,05 wt% of the crystallization inhibitors (e.g. salts of polyacrylic acid). The tank mix adjuvant usually contains from 0,1 to 5,0 wt%, preferably from 0,25 to 2,5 wt% of the crystallization inhibitors (e.g. salts of polyacrylic acid).

Suitable **solid carriers** or fillers are mineral earths, e.g. silicates, silica gels, talc, kaolins, limestone, lime, chalk, clays, dolomite, diatomaceous earth, bentonite, calcium sulfate, magnesium sulfate, magnesium oxide; polysaccharides, e.g. cellulose, starch; fertilizers, e.g. ammonium sulfate, ammonium phosphate, ammonium nitrate, ureas; products of vegetable origin, e.g. cereal meal, tree bark meal, wood meal, nutshell meal, and mixtures thereof.

Suitable **surfactants** are surface-active compounds, such as anionic, cationic, nonionic and amphoteric surfactants, block polymers, polyelectrolytes, and mixtures thereof. Such surfactants can be used as emulsifier, dispersant, solubilizer, wetter, penetration enhancer, protective colloid, or adjuvant. Examples of surfactants are listed in McCutcheon's, Vol.1: Emulsifiers & Detergents, McCutcheon's Directories, Glen Rock, USA, 2008 (International Ed. or North American Ed.).

Suitable **anionic** surfactants are alkali, alkaline earth or ammonium salts of sulfonates, sulfates, phosphates, carboxylates, and mixtures thereof. Examples of sulfonates are alkylarylsulfonates, diphenylsulfonates, alpha-olefin sulfonates, lignine sulfonates, sulfonates of fatty acids and oils, sulfonates of ethoxylated alkylphenols, sulfonates of alkoxyated arylphenols, sulfonates of condensed naphthalenes, sulfonates of dodecyl- and tridecylbenzenes, sulfonates of naphthalenes and alkylnaphthalenes, sulfosuccinates or sulfosuccinamates. Examples of sulfates are sulfates of fatty acids and oils, of ethoxylated alkylphenols, of alcohols, of ethoxylated alcohols, or of fatty acid esters. Examples of phosphates are phosphate esters. Examples of carboxylates are alkyl carboxylates, and carboxylated alcohol or alkylphenol ethoxylates.

Suitable **nonionic** surfactants are alkoxyates, N-substituted fatty acid amides, amine oxides, esters, sugar-based surfactants, polymeric surfactants, and mixtures thereof. Examples of alkoxyates are compounds such as alcohols, alkylphenols, amines, amides, arylphenols, fatty acids or fatty acid esters which have been alkoxyated with 1 to 50 equivalents. Ethylene oxide and/or propylene oxide may be employed for the alkoxylation, preferably ethylene oxide. Examples of N-substituted fatty acid amides are fatty acid glucamides or fatty acid alkanolamides. Examples of esters are fatty acid esters, glycerol esters or monoglycerides. Examples of sugar-

based surfactants are sorbitans, ethoxylated sorbitans, sucrose and glucose esters or alkylpolyglucosides. Examples of polymeric surfactants are home- or copolymers of vinylpyrrolidone, vinylalcohols, or vinylacetate.

- 5 Suitable **cationic** surfactants are quaternary surfactants, for example quaternary ammonium compounds with one or two hydrophobic groups, or salts of long-chain primary amines. Suitable **amphoteric** surfactants are alkylbetains and imidazolines. Suitable **block polymers** are block polymers of the A-B or A-B-A type comprising blocks of polyethylene oxide and polypropylene oxide, or of the A-B-C type comprising alkanol, polyethylene oxide and polypropylene oxide.
- 10 Suitable **polyelectrolytes** are polyacids or polybases. Examples of polyacids are alkali salts of polyacrylic acid or polyacid comb polymers. Examples of polybases are polyvinylamines or polyethyleneamines.

- Suitable **anti-drift agents** are for example nonionic polymers (such as polyacrylamides, polyethylene glycols, or guar gum with a molecular weight of at least 20 kDa, preferably at least 50 kDa, and in particular at least 100 kDa. Such products are commercially available under the tradenames Guar DV27 from Rhodia, Companion® Gold, Border® EG, Direct®, Affect® GC. Further examples for anti-drift agents are oils, such as mineral oil, plant oils, methylated seed oil; lecithin; selfemulsifiably polyesters; surfactants, such as those mentioned above. Such
- 15 products are commercially available under the tradenames Termix® 5910, Wheather Guard Complete, Compadre®, Interlock®, Placement®, Silwett® L77, Hasten®, Premium® MSO, Transport® Plus, Point Blank® VM, Agridex®, Meth Oil®, Topcithin® UB, Topcithin® SB.
- 20

- Suitable **adjuvants** are compounds, which have a neglectable or even no pesticidal activity themselves, and which improve the biological performance of the composition on the target. Examples are surfactants, mineral or vegetable oils, and other auxiliaries. Further examples are listed by Knowles, Adjuvants and additives, Agrow Reports DS256, T&F Informa UK, 2006, chapter 5.
- 25

- 30 Preferably, the composition contains an **adjuvant**. The adjuvant is usually selected from the above mentioned surfactants. Preferred adjuvants comprise at least one nonionic surfactant, more preferably an alkoxylate. Preferred alkoxylates are compounds such as alcohols, alkylphenols, amines, amides, arylphenols, fatty acids or fatty acid esters which have been alkoxylated with 1 to 50 equivalents. Ethylene oxide and/or propylene oxide may be employed for the alkox-
- 35 ylation, preferably ethylene oxide.

- Especially preferred adjuvants are **alkoxylated alkylamines**, such as linear or branched C₆₋₃₀ alkylamines, which are ethoxylated and/or propoxylated. Examples are tallow amine ethoxylated, 2-propylheptylamine ethoxylate, iso-C₉-alkylamine ethoxylate. Further examples are those
- 40 listed in WO 2011/019652 (Monsanto), paragraph [0068] to [0084].

The composition may contain at least 0,5 wt%, preferably at least 4 wt% and in particular at

least 10 wt% adjuvant.

Suitable **thickeners** are polysaccharides (e.g. xanthan gum, carboxymethylcellulose), anorganic clays (organically modified or unmodified), polycarboxylates, and silicates.

5

Suitable **bactericides** are bronopol and isothiazolinone derivatives such as alkylisothiazolinones and benzisothiazolinones.

Suitable **anti-freezing agents** are ethylene glycol, propylene glycol, urea and glycerin.

10 Suitable humectants are ethylene glycol, propylene glycol, urea and glycerin.

Suitable **anti-foaming agents** are silicones, long chain alcohols, and salts of fatty acids. Preferred anti-foaming agents are silicones, such as polydimethylsiloxan. Silicone based anti-foaming agents are commercially available, e.g. as KM 72 from Shin Etsu, SAG® 220 or SAG®
15 30 from Momentive, or Antifoam AF-30.

Suitable **colorants** (e.g. in red, blue, or green) are pigments of low water solubility and water-soluble dyes. Examples are inorganic colorants (e.g. iron oxide, titan oxide, iron hexacyanoferrate) and organic colorants (e.g. alizarin-, azo- and phthalocyanine colorants).

20

Suitable **tackifiers or binders** are polyvinylpyrrolidons, polyvinylacetates, polyvinyl alcohols, polyacrylates, biological or synthetic waxes, and cellulose ethers.

Examples for composition types and their preparation are as follows (wherein "i) Water-soluble concentrates" is preferred):

25

i) Water-soluble concentrates (SL, LS)

10-60 wt% of a composition according to the invention and 5-15 wt% wetting agent (e.g. alcohol alkoxylates) are dissolved in water and/or in a water-soluble solvent (e.g. alcohols) ad 100 wt%. The active substance dissolves upon dilution with water.

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ii) Dispersible concentrates (DC)

5-25 wt% of a composition according to the invention and 1-10 wt% dispersant (e. g. polyvinylpyrrolidone) are dissolved in organic solvent (e.g. cyclohexanone) ad 100 wt%. Dilution with water gives a dispersion.

iii) Emulsifiable concentrates (EC)

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15-70 wt% of a composition according to the invention and 5-10 wt% emulsifiers (e.g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in water-insoluble organic solvent (e.g. aromatic hydrocarbon) ad 100 wt%. Dilution with water gives an emulsion.

iv) Emulsions (EW, EO, ES)

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5-40 wt% of a composition according to the invention and 1-10 wt% emulsifiers (e.g. calcium dodecylbenzenesulfonate and castor oil ethoxylate) are dissolved in 20-40 wt% water-insoluble organic solvent (e.g. aromatic hydrocarbon). This mixture is introduced into water ad 100 wt% by means of an emulsifying machine and made into a homogeneous emulsion. Dilution with

water gives an emulsion.

v) Suspensions (SC, OD, FS)

In an agitated ball mill, 20-60 wt% of a composition according to the invention are comminuted with addition of 2-10 wt% dispersants and wetting agents (e.g. sodium lignosulfonate and alcohol ethoxylate), 0,1-2 wt% thickener (e.g. xanthan gum) and water ad 100 wt% to give a fine active substance suspension. Dilution with water gives a stable suspension of the active substance. For FS type composition up to 40 wt% binder (e.g. polyvinylalcohol) is added.

vi) Water-dispersible granules and water-soluble granules (WG, SG)

50-80 wt% of a composition according to the invention are ground finely with addition of dispersants and wetting agents (e.g. sodium lignosulfonate and alcohol ethoxylate) ad 100 wt% and prepared as water-dispersible or water-soluble granules by means of technical appliances (e.g. extrusion, spray tower, fluidized bed). Dilution with water gives a stable dispersion or solution of the active substance.

vii) Water-dispersible powders and water-soluble powders (WP, SP, WS)

50-80 wt% of a composition according to the invention are ground in a rotor-stator mill with addition of 1-5 wt% dispersants (e.g. sodium lignosulfonate), 1-3 wt% wetting agents (e.g. alcohol ethoxylate) and solid carrier (e.g. silica gel) ad 100 wt%. Dilution with water gives a stable dispersion or solution of the active substance.

viii) Gel (GW, GF)

In an agitated ball mill, 5-25 wt% of a composition according to the invention are comminuted with addition of 3-10 wt% dispersants (e.g. sodium lignosulfonate), 1-5 wt% thickener (e.g. carboxymethylcellulose) and water ad 100 wt% to give a fine suspension of the active substance. Dilution with water gives a stable suspension of the active substance.

iv) Microemulsion (ME)

5-20 wt% of a composition according to the invention are added to 5-30 wt% organic solvent blend (e.g. fatty acid dimethylamide and cyclohexanone), 10-25 wt% surfactant blend (e.g. alcohol ethoxylate and arylphenol ethoxylate), and water ad 100 %. This mixture is stirred for 1 h to produce spontaneously a thermodynamically stable microemulsion.

iv) Microcapsules (CS)

An oil phase comprising 5-50 wt% of a composition according to the invention, 0-40 wt% water insoluble organic solvent (e.g. aromatic hydrocarbon), 2-15 wt% acrylic monomers (e.g. methylmethacrylate, methacrylic acid and a di- or triacrylate) are dispersed into an aqueous solution of a protective colloid (e.g. polyvinyl alcohol). Radical polymerization initiated by a radical initiator results in the formation of poly(meth)acrylate microcapsules. Alternatively, an oil phase comprising 5-50 wt% of a composition according to the invention, 0-40 wt% water insoluble organic solvent (e.g. aromatic hydrocarbon), and an isocyanate monomer (e.g. diphenylmethane-4,4'-diisocyanate) are dispersed into an aqueous solution of a protective colloid (e.g. polyvinyl alcohol). The addition of a polyamine (e.g. hexamethylenediamine) results in the formation of a polyurea microcapsules. The monomers amount to 1-10 wt%. The wt% relate to the total CS composition.

ix) Dustable powders (DP, DS)

1-10 wt% of a composition according to the invention are ground finely and mixed intimately

with solid carrier (e.g. finely divided kaolin) ad 100 wt%.

x) Granules (GR, FG)

0.5-30 wt% of a composition according to the invention is ground finely and associated with solid carrier (e.g. silicate) ad 100 wt%. Granulation is achieved by extrusion, spray-drying or the fluidized bed.

xi) Ultra-low volume liquids (UL)

1-50 wt% of a composition according to the invention are dissolved in organic solvent (e.g. aromatic hydrocarbon) ad 100 wt%.

The compositions types i) to xi) may optionally comprise further auxiliaries, such as 0,1-1 wt% bactericides, 5-15 wt% anti-freezing agents, 0,1-1 wt% anti-foaming agents, and 0,1-1 wt% colorants.

Very suitable agrochemical compositions are:

a) Water-soluble concentrate

10 – 70 wt% sum of alkali metal salt of dicamba and an alkali metal salt of glyphosate, and optionally at least one further pesticide, 30 – 90 wt% water, optionally up to 30 wt% base, and optionally up to 10 wt% auxiliaries, such as surfactants, thickeners, or colorants, wherein the amount of all components adds up to 100 wt%.

b) Wettable-powder

10 – 90 wt% sum of alkali metal salt of dicamba and an alkali metal salt of glyphosate, and optionally at least one further pesticide, 9 – 80 wt% solid carrier, 1 - 10 wt% surfactant, optionally up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

c) Water dispersable granules

10 – 90 wt% sum of alkali metal salt of dicamba and an alkali metal salt of glyphosate, and optionally at least one further pesticide, 9 – 80 wt% solid carrier, 1 - 10 wt% surfactant, optionally up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

d) Granules

0.5 - 20 wt% sum of alkali metal salt of dicamba and an alkali metal salt of glyphosate, and optionally at least one further pesticide, 0.5 - 20 wt% solvent, 40 – 99 wt% solid carrier, optionally up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

In another form very suitable agrochemical compositions are:

a) Water-soluble concentrate

10 – 70 wt% sum of all pesticides, 30 – 90 wt% water, optionally up to 30 wt% base, and optionally up to 10 wt% auxiliaries, such as surfactants, thickeners, or colorants, wherein the amount of all components adds up to 100 wt%.

b) Wettable-powder

10 – 90 wt% sum of all pesticides, 9 – 80 wt% solid carrier, 1 - 10 wt% surfactant, optionally

up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

c) Water dispersable granules

10 – 90 wt% sum of all pesticides, 9 – 80 wt% solid carrier, 1 – 10 wt% surfactant, optionally up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

d) Granules

0.5 – 20 wt% sum of all pesticides, 0.5 – 20 wt% solvent, 40 – 99 wt% solid carrier, optionally up to 30 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

Especially suitable agrochemical compositions are:

a) Water-soluble concentrate

20 – 60 wt% sum of sodium and/or potassium salt of dicamba and sodium and/or potassium salt of glyphosate, and optionally at least one further pesticide, 30 – 90 wt% water, optionally up to 15 wt% base, and optionally up to 10 wt% auxiliaries, such as surfactants, thickeners, or colorants, wherein the amount of all components adds up to 100 wt%.

b) Wettable-powder

10 – 90 wt% sum of sodium and/or potassium salt of dicamba and sodium and/or potassium salt of glyphosate, and optionally at least one further pesticide, 9 – 80 wt% solid carrier, 1 – 10 wt% surfactant, optionally up to 15 wt% base, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

c) Water dispersable granules

10 – 90 wt% sum of sodium and/or potassium salt of dicamba and sodium and/or potassium salt of glyphosate, optionally up to 15 wt% base, and optionally at least one further pesticide, 9 – 80 wt% solid carrier, 1 – 10 wt% surfactant, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

d) Granules

0.5 – 20 wt% sum of sodium and/or potassium salt of dicamba and sodium and/or potassium salt of glyphosate, optionally up to 15 wt% base, and optionally at least one further pesticide, 0.5 – 20 wt% solvent, 40 – 99 wt% solid carrier, and optionally auxiliaries, wherein the amount of all components adds up to 100 wt%.

The present invention also relates to a method of combating harmful insects and/or phytopathogenic fungi, which comprises contacting plants, seed, soil or habitat of plants in or on which the harmful insects and/or phytopathogenic fungi are growing or may grow, plants, seed or soil to be protected from attack or infestation by said harmful insects and/or phytopathogenic fungi with an effective amount of the composition according to the invention.

The present invention also relates to a method of controlling undesired vegetation, which comprises allowing a herbicidal effective amount of the composition according to the invention to act

on plants, their habitat or on seed of said plants. Preferably, the plants are genetically modified crops, that are tolerant at least to auxins.

Solutions for seed treatment (LS), Suspoemulsions (SE), flowable concentrates (FS), powders for dry treatment (DS), water-dispersible powders for slurry treatment (WS), water-soluble powders (SS), emulsions (ES), emulsifiable concentrates (EC) and gels (GF) are usually employed for the purposes of **treatment of plant propagation materials**, particularly seeds. The compositions in question give, after two-to-tenfold dilution, active substance concentrations of from 0.01 to 60% by weight, preferably from 0.1 to 40% by weight, in the ready-to-use preparations. Application can be carried out before or during sowing. Methods for applying the compositions thereof, respectively, on to plant propagation material, especially seeds include dressing, coating, pelleting, dusting, soaking and in-furrow application methods of the propagation material. Preferably, composition or the compositions thereof, respectively, are applied on to the plant propagation material by a method such that germination is not induced, e. g. by seed dressing, pelleting, coating and dusting.

When employed in plant protection, the **amounts of active substances applied** are, depending on the kind of effect desired, from 0.001 to 2 kg per ha, preferably from 0.005 to 2 kg per ha, more preferably from 0.05 to 0.9 kg per ha, and in particular from 0.1 to 0.75 kg per ha. In treatment of plant propagation materials such as seeds, e. g. by dusting, coating or drenching seed, amounts of active substance of from 0.1 to 1000 g, preferably from 1 to 1000 g, more preferably from 1 to 100 g and most preferably from 5 to 100 g, per 100 kilogram of plant propagation material (preferably seeds) are generally required. When used in the protection of materials or stored products, the amount of active substance applied depends on the kind of application area and on the desired effect. Amounts customarily applied in the protection of materials are 0.001 g to 2 kg, preferably 0.005 g to 1 kg, of active substance per cubic meter of treated material.

Examples of suitable **crops** are the following:

Allium cepa, Ananas comosus, Arachis hypogaea, Asparagus officinalis, Avena sativa, Beta vulgaris spec. altissima, Beta vulgaris spec. rapa, Brassica napus var. napus, Brassica napus var. napobrassica, Brassica rapa var. silvestris, Brassica oleracea, Brassica nigra, Brassica juncea, Brassica campestris, Camellia sinensis, Carthamus tinctorius, Carya illinoensis, Citrus limon, Citrus sinensis, Coffea arabica (Coffea canephora, Coffea liberica), Cucumis sativus, Cynodon dactylon, Daucus carota, Elaeis guineensis, Fragaria vesca, Glycine max, Gossypium hirsutum, (Gossypium arboreum, Gossypium herbaceum, Gossypium vitifolium), Helianthus annuus, Hevea brasiliensis, Hordeum vulgare, Humulus lupulus, Ipomoea batatas, Juglans regia, Lens culinaris, Linum usitatissimum, Lycopersicon lycopersicum, Malus spec., Manihot esculenta, Medicago sativa, Musa spec., Nicotiana tabacum (N.rustica), Olea europaea, Oryza sativa, Phaseolus lunatus, Phaseolus vulgaris, Picea abies, Pinus spec., Pistacia vera, Pisum sativum, Prunus avium, Prunus persica, Pyrus communis, Prunus armeniaca, Prunus cerasus, Prunus dulcis and prunus domestica, Ribes sylvestre, Ricinus communis, Saccharum officinar-

um, *Secale cereale*, *Sinapis alba*, *Solanum tuberosum*, *Sorghum bicolor* (s. *vulgare*), *Theobroma cacao*, *Trifolium pratense*, *Triticum aestivum*, *Triticale*, *Triticum durum*, *Vicia faba*, *Vitis vinifera*, *Zea mays*.

- 5 Preferred crops are: *Arachis hypogaea*, *Beta vulgaris* spec. *altissima*, *Brassica napus* var. *napus*, *Brassica oleracea*, *Brassica juncea*, *Citrus limon*, *Citrus sinensis*, *Coffea arabica* (*Coffea canephora*, *Coffea liberica*), *Cynodon dactylon*, *Glycine max*, *Gossypium hirsutum*, (*Gossypium arboreum*, *Gossypium herbaceum*, *Gossypium vitifolium*), *Helianthus annuus*, *Hordeum vulgare*, *Juglans regia*, *Lens culinaris*, *Linum usitatissimum*, *Lycopersicon lycopersicum*, *Malus spec.*, *Medicago sativa*, *Nicotiana tabacum* (*N. rustica*), *Olea europaea*, *Oryza sativa*,
 10 *Phaseolus lunatus*, *Phaseolus vulgaris*, *Pistacia vera*, *Pisum sativum*, *Prunus dulcis*, *Saccharum officinarum*, *Secale cereale*, *Solanum tuberosum*, *Sorghum bicolor* (s. *vulgare*), *Triticale*, *Triticum aestivum*, *Triticum durum*, *Vicia faba*, *Vitis vinifera* and *Zea mays*.
- 15 The method according to the invention can preferably be used in **genetically modified crops**. The term "genetically modified crops" is to be understood as plants, which genetic material has been modified by the use of recombinant DNA techniques in a way that under natural circumstances it cannot readily be obtained by cross breeding, mutations, natural recombination,
 20 breeding, mutagenesis, or genetic engineering. Typically, one or more genes have been integrated into the genetic material of a genetically modified plant in order to improve certain properties of the plant. Such genetic modifications also include but are not limited to targeted post-translational modification of protein(s), oligo- or polypeptides e. g. by glycosylation or polymer additions such as prenylated, acetylated or farnesylated moieties or PEG moieties.
- 25 Plants that have been modified by breeding, mutagenesis or genetic engineering, e.g. have been rendered tolerant to applications of specific classes of herbicides, are particularly useful with the composition and method according to the invention. **Tolerance** to classes of herbicides has been developed such as **auxin herbicides** such as dicamba or 2,4-D (i.e. auxin tolerant crops); bleacher herbicides such as hydroxyphenylpyruvate dioxygenase (HPPD) inhibitors or
 30 phytoene desaturase (PDS) inhibitors; acetolactate synthase (ALS) inhibitors such as sulfonyl ureas or imidazolinones; enolpyruvyl shikimate 3-phosphate synthase (EPSP) inhibitors such as glyphosate; glutamine synthetase (GS) inhibitors such as glufosinate; protoporphyrinogen-IX oxidase (PPO) inhibitors; lipid biosynthesis inhibitors such as acetyl CoA carboxylase (ACCase) inhibitors; or oxynil (i. e. bromoxynil or ioxynil) herbicides as a result of conventional methods of
 35 breeding or genetic engineering. Furthermore, plants have been made **resistant to multiple classes of herbicides** through multiple genetic modifications, such as resistance to both glyphosate and glufosinate or to both glyphosate and a herbicide from another class such as ALS inhibitors, HPPD inhibitors, auxin herbicides, or ACCase inhibitors. These herbicide resistance technologies are, for example, described in Pest Management Science 61, 2005, 246; 61, 2005,
 40 258; 61, 2005, 277; 61, 2005, 269; 61, 2005, 286; 64, 2008, 326; 64, 2008, 332; Weed Science 57, 2009, 108; Australian Journal of Agricultural Research 58, 2007, 708; Science 316, 2007, 1185; and references quoted therein. Examples of these herbicide resistance technologies are

also described in US 2008/0028482, US2009/0029891, WO 2007/143690, WO 2010/080829, US 6307129, US 7022896, US 2008/0015110, US 7,632,985, US 7105724, and US 7381861, each herein incorporated by reference.

- 5 Several cultivated plants have been rendered tolerant to herbicides by conventional methods of breeding (mutagenesis), e. g. Clearfield® summer rape (Canola, BASF SE, Germany) being tolerant to imidazolinones, e. g. imazamox, or ExpressSun® sunflowers (DuPont, USA) being tolerant to sulfonyl ureas, e. g. tribenuron. Genetic engineering methods have been used to render cultivated plants such as soybean, cotton, corn, beets and rape, tolerant to herbicides
10 such as glyphosate, dicamba, imidazolinones and glufosinate, some of which are under development or commercially available under the brands or trade names RoundupReady® (glyphosate tolerant, Monsanto, USA), Cultivance® (imidazolinone tolerant, BASF SE, Germany) and LibertyLink® (glufosinate tolerant, Bayer CropScience, Germany).
- 15 Preferably, the crops are genetically modified crops, that are **tolerant at least to auxins**, in particular crops which are tolerant at least to dicamba and/or to glyphosate.

Furthermore, plants are also covered that are by the use of recombinant DNA techniques capable to synthesize one or more insecticidal proteins, especially those known from the bacterial
20 genus *Bacillus*, particularly from *Bacillus thuringiensis*, such as δ -endotoxins, e. g. CryIA(b), CryIA(c), CryIF, CryIF(a2), CryIIA(b), CryIIIA, CryIIIB(b1) or Cry9c; vegetative insecticidal proteins (VIP), e. g. VIP1, VIP2, VIP3 or VIP3A; insecticidal proteins of bacteria colonizing nematodes, e. g. *Photorhabdus* spp. or *Xenorhabdus* spp.; toxins produced by animals, such as scorpion toxins, arachnid toxins, wasp toxins, or other insect-specific neurotoxins; toxins produced by fungi, such Streptomyces toxins, plant lectins, such as pea or barley lectins; agglutins;
25 proteinase inhibitors, such as trypsin inhibitors, serine protease inhibitors, patatin, cystatin or papain inhibitors; ribosome-inactivating proteins (RIP), such as ricin, maize-RIP, abrin, luffin, saporin or bryodin; steroid metabolism enzymes, such as 3-hydroxy-steroid oxidase, ecdysteroid-IDP-glycosyl-transferase, cholesterol oxidases, ecdysone inhibitors or HMG-CoA-reductase;
30 ion channel blockers, such as blockers of sodium or calcium channels; juvenile hormone esterase; diuretic hormone receptors (helicokinin receptors); stilben synthase, bibenzyl synthase, chitinases or glucanases. In the context of the present invention these insecticidal proteins or toxins are to be understood expressly also as pre-toxins, hybrid proteins, truncated or otherwise modified proteins. Hybrid proteins are characterized by a new combination of protein domains, (see, e. g. WO 02/015701). Further examples of such toxins or genetically modified
35 plants capable of synthesizing such toxins are disclosed, e. g., in EP-A 374 753, WO 93/007278, WO 95/34656, EP-A 427 529, EP-A 451 878, WO 03/18810 und WO 03/52073. The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, e. g. in the publications mentioned above. These insecticidal
40 proteins contained in the genetically modified plants impart to the plants producing these proteins tolerance to harmful pests from all taxonomic groups of arthropods, especially to beetles (Coleoptera), two-winged insects (Diptera), and moths (Lepidoptera) and to nematodes (Nema-

toda). Genetically modified plants capable to synthesize one or more insecticidal pro-teins are, e. g., described in the publications mentioned above, and some of which are commercially available such as YieldGard® (corn cultivars producing the Cry1Ab toxin), YieldGard® Plus (corn cultivars producing Cry1Ab and Cry3Bb1 toxins), Starlink® (corn cultivars producing the Cry9c toxin), Herculex® RW (corn cultivars producing Cry34Ab1, Cry35Ab1 and the enzyme Phosphinothricin-N-Acetyltransferase [PAT]); NuCOTN® 33B (cotton cultivars producing the Cry1Ac toxin), Bollgard® I (cotton cultivars producing the Cry1Ac toxin), Bollgard® II (cotton cultivars producing Cry1Ac and Cry2Ab2 toxins); VIPCOT® (cotton cultivars producing a VIP-toxin); NewLeaf® (potato cultivars producing the Cry3A toxin); Bt-Xtra®, NatureGard®, KnockOut®, BiteGard®, Protecta®, Bt11 (e. g. Agrisure® CB) and Bt176 from Syngenta Seeds SAS, France, (corn cultivars producing the Cry1Ab toxin and PAT enzyme), MIR604 from Syngenta Seeds SAS, France (corn cultivars producing a modified version of the Cry3A toxin, c.f. WO 03/018810), MON 863 from Monsanto Europe S.A., Belgium (corn cultivars producing the Cry3Bb1 toxin), IPC 531 from Monsanto Europe S.A., Belgium (cotton cultivars producing a modified version of the Cry1Ac toxin) and 1507 from Pioneer Overseas Corporation, Belgium (corn cultivars producing the Cry1F toxin and PAT enzyme).

Furthermore, plants are also covered that are by the use of recombinant DNA techniques capable to synthesize one or more proteins to increase the resistance or tolerance of those plants to bacterial, viral or fungal pathogens. Examples of such proteins are the so-called "pathogenesis-related proteins" (PR proteins, see, e.g. EP-A 392 225), plant disease resistance genes (e. g. potato cultivars, which express resistance genes acting against *Phytophthora infestans* derived from the mexican wild potato *Solanum bulbocastanum*) or T4-lyso-zym (e.g. potato cultivars capable of synthesizing these proteins with increased resistance against bacteria such as *Erwinia amylovora*). The methods for producing such genetically modified plants are generally known to the person skilled in the art and are described, e.g. in the publications mentioned above.

Furthermore, plants are also covered that are by the use of recombinant DNA techniques capable to synthesize one or more proteins to increase the productivity (e.g. bio mass production, grain yield, starch content, oil content or protein content), tolerance to drought, salinity or other growth-limiting environmental factors or tolerance to pests and fungal, bacterial or viral pathogens of those plants.

Furthermore, plants are also covered that contain by the use of recombinant DNA techniques a modified amount of substances of content or new substances of content, specifically to improve human or animal nutrition, e. g. oil crops that produce health-promoting long-chain omega-3 fatty acids or unsaturated omega-9 fatty acids (e. g. Nexera® rape, DOW Agro Sciences, Canada).

Furthermore, plants are also covered that contain by the use of recombinant DNA techniques a modified amount of substances of content or new substances of content, specifically to improve

raw material production, e.g. potatoes that produce increased amounts of amylopectin (e.g. Amflora® potato, BASF SE, Germany).

Furthermore, it has been found that the composition and method according to the invention are also suitable for the **defoliation** and/or desiccation of plant parts, for which crop plants such as cotton, potato, oilseed rape, sunflower, soybean or field beans, in particular cotton, are suitable. In this regard compositions have been found for the desiccation and/or defoliation of plants, processes for preparing these compositions, and methods for desiccating and/or defoliating plants using the composition and method according to the invention.

As desiccants, the composition and method according to the invention are suitable in particular for desiccating the above-ground parts of crop plants such as potato, oilseed rape, sunflower and soybean, but also cereals. This makes possible the fully mechanical harvesting of these important crop plants.

Also of economic interest is the **facilitation of harvesting**, which is made possible by concentrating within a certain period of time the dehiscence, or reduction of adhesion to the tree, in citrus fruit, olives and other species and varieties of pomaceous fruit, stone fruit and nuts. The same mechanism, i.e. the promotion of the development of abscission tissue between fruit part or leaf part and shoot part of the plants is also essential for the controlled defoliation of useful plants, in particular cotton. Moreover, a shortening of the time interval in which the individual cotton plants mature leads to an increased fiber quality after harvesting.

The composition and method according to the invention can be applied **pre- or post-emergence**, or together with the seed of a crop plant. It is also possible to apply the compounds and compositions by applying seed, pretreated with a composition of the invention, of a crop plant. If the active compounds A and C and, if appropriate C, are less well tolerated by certain crop plants, application techniques may be used in which the herbicidal compositions are sprayed, with the aid of the spraying equipment, in such a way that as far as possible they do not come into contact with the leaves of the sensitive crop plants, while the active compounds reach the leaves of undesirable plants growing underneath, or the bare soil surface (post-directed, lay-by).

The term "growth stage" refers to the growth stages as defined by **the BBCH Codes** in "Growth stages of mono- and dicotyledonous plants", 2nd edition 2001, edited by Uwe Meier from the Federal Biological Research Centre for Agriculture and Forestry. The BBCH codes are a well established system for a uniform coding of phenologically similar growth stages of all mono- and dicotyledonous plant species. In some countries related codes are known for specific crops. Such codes may be correlated to the BBCH code as exemplified by Harell et al., Agronomy J., 1998, 90, 235-238.

The composition may be allowed to act on crops at any growth stage, such as at BBCH Code 0, 1, 2, 3, 4, 5, 6 and/or 7. Preferably, the composition is allowed to act on crops at a growth stage

of BBCH Code 0, 1 and/or 2, or their habitat. In another preferred form, the composition is allowed to act on crops at a growth stage of BBCH Code 1, 2, 3, 4, 5, 6 and/or 7, especially 2, 3, 4, 5, 6 and/or 7.

- 5 The treatment of crop with the composition may be done by applying said pesticide by **ground or aerial application**, preferably by ground application. Suitable application devices are a pre-dosage device, a knapsack sprayer, a spray tank or a spray plane. Preferably the treatment is done by ground application, for example by a predosage device, a knapsack sprayer or a spray tank. The ground application may be done by a user walking through the crop field or with a
10 motor vehicle, preferably with a motor vehicle.

The term "**effective amount**" denotes an amount of the composition, which is sufficient for controlling undesired vegetation and which does not result in a substantial damage to the treated crops. Such an amount can vary in a broad range and is dependent on various factors, such as
15 the species to be controlled, the treated cultivated plant or habitat, the climatic conditions and the auxin herbicide.

The composition, e.g. in the form of an aqueous tank mix, is typically applied at a volume of **5 to 2000 l/ha**, preferably of 25 to 500 l/ha. The tank mix is usually ready to use for application. The
20 tank mix is preferably a sprayable aqueous composition.

The composition is typically applied at a **rate of 50 to 3000 g/ha** pesticide, preferably 200 to 5000 g/ha. The composition is typically applied at a rate of 50 to 1500 g/ha dicamba acid equivalent, preferably 100 to 1000 g/ha. The composition is typically applied at a rate of 200 to 5000
25 g/ha glyphosate acid equivalent, preferably 400 to 3000 g/ha.

The tank mix may comprise the dicamba and glyphosate (each as acid equivalent) in a **total amount** of at least 0,01 wt%, and preferably at least 0,05 wt. The tank mix may comprise the dicamba and glyphosate (each as acid equivalent) in a **total amount** of up to 35 wt%, preferably
30 up to 30 wt%, more preferably up to 15 wt%, and in particular up to 8 wt%, each based on the tank mix.

The tank mix may comprise at least 60 wt%, preferably at least 70 wt%, more preferably at least 80 wt% and in particular at least 90 wt% **water**.
35

The tank mix may contain from 0,4 to 200 g/l, preferably from 0,8 to 100 g/l, and in particular from 2 to 50 g/l of the base selected from an alkali salt of hydrogencarbonate.

In another form the tank mix is typically applied at a rate of 5 to 3000 g/ha pesticide (e.g.
40 dicamba), preferably 20 to 1500 g/ha.

The tank mix is typically applied at a rate of 0,1 to 10 kg/ha base, preferably 0,2 to 5 kg/ha.

In a further embodiment, the composition or method according to the invention can be applied by **treating seed**. The treatment of seed comprises essentially all procedures familiar to the person skilled in the art (seed dressing, seed coating, seed dusting, seed soaking, seed film coating, seed multilayer coating, seed encrusting, seed dripping and seed pelleting) based on the composition and method according to the invention. Here, the herbicidal compositions can be applied diluted or undiluted.

The term seed comprises seed of all types, such as, for example, corns, seeds, fruits, tubers, seedlings and similar forms. Here, preferably, the term seed describes corns and seeds.

The seed used can be seed of the useful plants mentioned above, but also the seed of transgenic plants or plants obtained by customary breeding methods.

The rates of application of the active compound are from 0.0001 to 3.0, preferably 0.01 to 1.0 kg/ha of active substance (a.s.), depending on the control target, the season, the target plants and the growth stage. To treat the seed, the pesticides are generally employed in amounts of from 0.001 to 10 kg per 100 kg of seed.

The present invention also relates to a **method for preparing the composition** according to the invention comprising a step of contacting an alkali metal salt of dicamba and an alkali metal salt of glyphosate. The contacting may be achieved by mixing the components in any sequence. Preferably, the contacting is done at ambient temperature, such as from 5 to 45 °C.

The present invention also relates to a method for preparing the according to the invention comprising a step of contacting a pesticide and a base (e.g. in form of a tank mix adjuvant) selected from an alkali salt of hydrogencarbonate. Preferably, the method comprises a step of contacting the pesticide, the alkali salt of hydrogencarbonate, and an alkali salt of carbonate. Preferably, the weight ratio of the alkali metal salt of hydrogencarbonate to the alkali metal salt of carbonate is from 1:20 to 20:1. Preferably, the alkali metal salt of hydrogencarbonate is added in an amount of at least 1 wt%, based on the total amount of the composition.

The base and optionally the further base may be applied in form of a **tank mix adjuvant**. The tank mix adjuvant may be present in form of an aqueous liquid or a particulate solid.

In one form the tank mix adjuvant is present in form of an **aqueous liquid** (e.g. at 20 °C), which contains at least 200 g/l, preferably at least 300 g/l, and in particular at least 400 g/l of the base and optionally including the further base. The aqueous liquid may contain at least 5 wt%, preferably at least 15 wt%, and in particular at least 30 wt% water. The aqueous liquid may contain up to 80 wt%, preferably up to 65 wt%, and in particular up to 50 wt% water.

The aqueous liquid may have a pH value of at least 8,0, preferably at least 8,5, more preferably at least 9,0, even more preferably at least 9,5, in particular at least 10,0, even more particular at least 11,0. The aqueous liquid may have a pH value of up to 14,0, preferably up to 13,0, and in particular up to 12,0. The aqueous liquid may have a pH value in the range of 8,0 to 14,0, preferably of 8,0 to 13,0, and in particular from 8,5 to 12,5.

The aqueous liquid may comprise **auxiliaries**, such as those listed below. Preferably, the aqueous liquid comprises auxiliaries such as anti-freezing agents (e.g. glycerin), anti-foaming agents, (e.g. silicones), anti-drift agents, crystallization inhibitors (e.g. salts of polyacrylic acid), or binders. The aqueous liquid may comprise up to 15 wt%, preferably up to 10 wt%, and in particular up to 5 wt% auxiliaries.

In a preferred form the aqueous liquid contains at least 200 g/l of the base and optionally including the further base (such as an alkali salt of HCO_3^- and optionally an alkali salt of CO_3^{2-}), up to 15 wt% of auxiliaries (e.g. anti-drift agent and crystallization inhibitors (e.g. salts of polyacrylic acid)), and has a pH value of at least 8,0.

In a preferred form the aqueous liquid contains at least 250 g/l of the base and optionally including the further base (such as an alkali salt of HCO_3^- and optionally an alkali salt of CO_3^{2-}), up to 10 wt% of auxiliaries (e.g. anti-drift agent and crystallization inhibitors (e.g. salts of polyacrylic acid)), and has a pH value of at least 8,5.

In another form the tank mix adjuvant is present in form of a **particulate solid** (e.g. at 20 °C), which contains at least 50 wt%, preferably at least 80 wt%, and in particular at least 90 wt% of the base and optionally including the further base.

The particulate solid may have a particle size D_{90} of up to 100 μm , preferably up to 10 μm , and in particular up to 5 μm . The particle size may be determined by sieving.

The particulate solid may contain less than 1 wt% dust. Dust means typically particles, which have a particle size of below 50 μm .

The particulate solid may be soluble in water (e.g. in the tank mix) in an amount of at least 0,5 wt%, preferably at least 5 wt%, and in particular at least 20 wt%.

The particulate solid may a pH value (10 wt% in water) of at least 8,0, preferably at least 8,5, more preferably at least 9,0, even more preferably at least 9,5, in particular at least 10,0, even more particular at least 11,0.

The particulate solid may comprise **auxiliaries**, such as those listed below. Preferably, the particulate solid comprises auxiliaries such as anti-foaming agents (e.g. silicones), binders, anti-drift agents, crystallization inhibitors (e.g. salts of polyacrylic acid), or separating agents. The

particulate solid may comprise up to 15 wt%, preferably up to 10 wt%, and in particular up to 5 wt% auxiliaries.

5 Suitable **separating agents** are kaolinite, aluminum silicate, aluminum hydroxide, calcium carbonate, magnesium carbonate. The particulate solid may contain up to 5 wt%, preferably up to 2 wt% of the separating agent.

10 In a preferred form the particulate solid contains at least 80 wt% of the base (such as an alkali salt of CO_3^{2-} and/or an alkali salt of HCO_3^-), up to 10 wt% auxiliaries (e.g. a separating agent), and has a particle size D_{90} of up to 10 mm.

15 In a more preferred form the particulate solid contains at least 90 wt% of the base and optionally including the further base (such as an alkali salt of HCO_3^- and optionally an alkali salt of CO_3^{2-}), up to 5 wt% auxiliaries (e.g. a separating agent and crystallization inhibitors (e.g. salts of polyacrylic acid)), and has a particle size D_{90} of up to 10 mm.

The invention offers various **advantages**: There is a very low rate of unwanted phytotoxic damage in neighbouring areas in which other crops (e.g. dicotyledon crops) grow. There is a reduced vapor pressure of dicamba. There is reduced wind drift of the actives, such as dicamba.
20 The composition is easy to prepare from industrial available components; the pesticidal effect of the pesticide is increased; the tank mix adjuvants are easy and safe to handle and to apply; the volatility of pesticides (e.g. auxin herbicides) is decreased; the efficacy of pesticides (e.g. glyphosate), which are sensitive to multivalent cations like Ca^{2+} or Mg^{2+} is conserved; the invention is very safe to crops; the volatility of pesticides (e.g. auxin herbicides) is preserved or
25 even decreased also after addition of anionic pesticides comprising mono- or diamine cations (e.g. isopropylamine glyphosate, dimethylamine glyphosate, ammonium glyphosate).

Examples

30 Surfactant A: Nonionic C8/10 alkylpolyglycosid (about 70 wt% active content and 30 wt% water), viscous liquid, water-soluble, HLB 13-14.

Surfactant B: Nonionic, branched, ethoxylated alkylamine, soluble in water.

Additive A: Water-soluble sodium salt of polyacrylic acid, molar mass 7-10 kDa, K-value about 25-30, solution in water (45 wt%).

35 Antidrift A: Termix® 5910, commercially available from Huntsman, liquid at 25 °C, density at 25 °C 0,99 g/ml; pour point -28 °C, pH 6-8 (1% in water), viscosity 207 mPas (20 °C).

Clarity®: Agrochemical formulation of dicamba salt of 2-(-aminoethoxy)ethanol (watersoluble concentrate SL, 480 g/l, commercially available from BASF Cooperation).

Banvel®: Agrochemical formulation of dicamba salt of dimethylamine (watersoluble concentrate SL, 48,2 wt%, commercially available from BASF Cooperation).

40 Touchdown® HiTech: Agrochemical formulation of glyphosate potassium salt (watersoluble concentrate SL, 500 g/l, commercially available from Syngenta).

Example 1 – Preparation of liquid tank mix adjuvant containing a base

- a) 400 g K_2CO_3 und 40 g $KHCO_3$ were dissolved in water at room temperature and filled up with water to a volume of 1,0 l. The aqueous solution had a pH of 11.
- b) 250 g K_2CO_3 , 25 g $KHCO_3$, 25 g Surfactant B and 150 g Surfactant A were dissolved in water at room temperature and filled up with water to a volume of 1,0 l. The aqueous solution had a pH of 11.
- c) 30 g K_2CO_3 , 180 g $KHCO_3$, 10 g Additive A are dissolved in water at room temperature and filled up with water to a volume of 1,0 l.
- d) 330 g K_2CO_3 and 10 g Additive A are dissolved in water at room temperature and filled up with water to a volume of 1,0 l.

Example 2 – Preparation of granulated tank mix adjuvant containing a base

A mixture of 900 g K_2CO_3 and 100 g $KHCO_3$ were provided in a fluidized bed granulator. 100 ml of a 10 wt% aqueous suspension of kaolin were sprayed into the fluidized bed. Water was simultaneously removed by a stream of hot air (100 °C). After sieving a dried particulated product was obtained with a particle size D_{90} below 10 mm.

Example 3 – Preparation of particulated tank mix adjuvant containing a base

900 g K_2CO_3 and 100 g $KHCO_3$ were dry mixed in a mixing plant. After sieving a homogenous mixture was obtained with a with a particle size D_{90} below 10 mm.

Example 4 – Preparation of tank mix

A sprayable tank mix is prepared by mixing at 20 °C while stirring a commercial SL formulation (Clarity®, Banvel®, or Touchdown® Hitech), water, and the tank mix adjuvants of Examples 1, 2, or 3. The concentration of the pesticide is 1, 5, or 15 g/l, respectively, and the concentration of the dissolved base is 3, 30 or 50 g/l, respectively, in the tank mix.

Example 5 – Biological evaluation

For the greenhouse tests, maize (cultivar Amadeo) and *Chenopodium album* was sown or potted in loamy sandy soil to a depth of 1-2 cm. When the plants had reached a growth height of 10 to 25 cm (around 10 to 21 days after sowing), the spray mixtures were applied to the plants in a spraying cabin.

The temperatures in the experimental period, which lasted for 3 to 4 weeks, were between 18-35°C. During this time, the experimental plants received optimum watering, with nutrients being supplied via the water used for watering.

The herbicidal activity was evaluated by awarding scores to the treated plants in comparison to the untreated control plants. The evaluation scale ranges from 0% to 100% activity. 100% activity means the complete death at least of those parts of the plant that are above ground. Conversely, 0% activity means that there were no differences between treated and untreated plants.

The water used was hard water having a hardness of 25 °dH. A tank mix ("Mix A") was applied with an application volume of 100 l/ha and with an application rate of 125 g/ha potassium glyphosate, 62,5 g/ha sodium dicamba, 300 g/ha Genamin® T150 (a tallow fatty amine ethoxylate with 15 EO), 300 g/l Preference® (an alkylphenol ethoxylate, sodium salts of soya fatty acids, isopropyl alcohol) and optionally 1000 g/ha K₂CO₃ ("Mix A + K₂CO₃"). The results are summarized in Table 1.

Table 1: Activity [%] after various days after treatment ("DAT")

Plant	DAT	Mix A ^{a)}	Mix A + K ₂ CO ₃
Sorghum halepense	7	60	88
Sorghum halepense	14	55	92
Sorghum halepense	21	50	92
Eleusine gracilis	7	73	78
Eleusine gracilis	14	78	92
Eleusine gracilis	21	80	97
Chenopodium album	7	75	82
Chenopodium album	14	87	90
Chenopodium album	21	93	97
Zea mays (Amadeo)	7	20	52
Zea mays (Amadeo)	14	37	68
Zea mays (Amadeo)	21	42	80

a) Comparative experiment.

Example 6 – Volatility

The volatility was determined by analyzing the loss of material by HLPL at 70 °C after 24 h at atmospheric pressure. A sample of the aqueous tank mix (300 l/ha) was placed on the petri dish with a defined area (corresponding to a desired field application rate, such as 500 g/ha pesticide). The loss is summarized in Table 2.

Table 2: Loss of dicamba, application rate 500 g/ha dicamba

	pH of tank mix	Loss (wt%)
Dicamba free acid ^{a)}	3,0	80
Banvel® ^{a)}	6,0	86
Clarity® ^{a)}	5,4	3,7
Clarity® + 0,5 eq. KHCO ₃	7,6	2,3
Clarity® + 1,0 eq. KHCO ₃	7,8	2,5
Clarity® + 2,0 eq. KHCO ₃	8,0	0,1
Clarity® + 4,0 eq. KHCO ₃	8,2	<0,1

a) Comparative experiment.

Example 7 – Volatility

The volatility was determined like in Example 6 and the loss is summarized in Table 3. The application rate was 500 g/ha dicamba (free acid), 1000 g/ha potassium glyphosate, 300 g/ha Genamin® T050 (“Ad2”, 300 g/ha Preference® (“Ad3”) and optionally 250, 500 or 1000 g/ha K₂CO₃. Deionised water (hardness <1°dH) was used to prepare the samples. Dicamba BAPMA refers to the bis(3-aminopropyl)methylamine salt of dicamba.

Table 3: Loss of dicamba

	pH of tank mix	Loss (wt%)
Dicamba BAPMA ^{a)}	6,3	<1
Dicamba BAPMA+Gly-K+Ad2+Ad3 ^{a)}	5	15
Dicamba BAPMA+Gly-K+Ad2+Ad3 + 250 g/ha K ₂ CO ₃	6	6
Dicamba BAPMA+Gly-K+Ad2+Ad3 + 500 g/ha K ₂ CO ₃	7	<4
Dicamba BAPMA+Gly-K+Ad2+Ad3 + 1000 g/ha K ₂ CO ₃	9	<3

a) Comparative experiment.

Example 8 – Preparation of Formulation

A suspension of 100 g glyphosate (free acid) in 600 g water was mixed while stirring with 3 mol equivalents of potassium hydroxide. 50 g dicamba-potassium, 20 g potassium hydrogencarbonate and 60 g potassium carbonate were added and the volume was filled up to 1,0 l with water. A liquid solution of the SL type was obtained.

Example 9 – Preparation of Formulation

A suspension of 100 g glyphosate (free acid) in 600 g water was mixed while stirring with 3 mol equivalents of potassium hydroxide. 50 g dicamba-potassium, 20 g potassium hydrogencarbonate, 60 g potassium carbonate, and 5 g Additive A were added and the volume was filled up to 1,0 l with water. A liquid solution of the SL type was obtained.

Example 10 – Preparation of tankmix

2,0 l Touchdown® Hitech and 500 g dicamba potassium are stirred into 50 l water (hardness 10 °dH). 4,0 l of the tank mix adjuvant from Example 1 d) are added and filled up to a final volume of 100 l with the water.

We claim:

1. A liquid aqueous composition, which has a pH value of at least 7,0, comprising a pesticide and a base selected from an alkali salt of hydrogencarbonate.
2. The composition according to claim 1, wherein composition comprises a further base selected from an alkali salt of carbonate.
3. The composition according to claim 2, wherein the weight ratio of the alkali salt of hydrogencarbonate to the alkali salt of carbonate is from 1:20 to 20:1.
4. The composition according to claims 1 to 3, wherein the composition contains at least 5 wt% of the hydrogencarbonate.
5. The composition according to claims 1 to 4, wherein the composition contains at least 10 wt% of the pesticide in dissolved form.
6. The composition according to claims 1 to 5, wherein pesticide comprises an alkali metal salt of dicamba and an alkali metal salt of glyphosate.
7. The composition according to claims 1 to 6, which contains an adjuvant selected from alkoxyates.
8. The composition according to claim 7, wherein the alkoxyate comprises an alkoxyated alkylamine.
9. The composition according to claims 1 to 8, which contains a humectant selected from ethylene glycol, propylene glycol, urea and glycerin.
10. The composition according to claims 1 to 9, which contains a crystallization inhibitor selected from polyacrylic acids and their salts.
11. A method for preparing the composition as defined in any of claims 1 to 10 comprising a step of contacting a pesticide and a base selected from an alkali salt of hydrogencarbonate.
12. The method according to claim 11, comprising a step of contacting the pesticide, the alkali salt of hydrogencarbonate, and an alkali salt of carbonate.
13. The method according to claim 12, wherein the weight ratio of the alkali salt of hydrogencarbonate to the alkali salt of carbonate is from 1:20 to 20:1.

14. The method according to claim 11 to 13, wherein the alkali salt of hydrogencarbonate is added in an amount of at least 1 wt%, based on the total amount of the composition.
- 5 15. A liquid aqueous composition which has a pH value of higher than 8,0 comprising an alkali metal salt of dicamba, an alkali metal salt of glyphosate, and a base.
16. The composition according to claim 15, wherein the base is selected from inorganic bases.
- 10 17. A method of combating harmful insects and/or phytopathogenic fungi, which comprises contacting plants, seed, soil or habitat of plants in or on which the harmful insects and/or phytopathogenic fungi are growing or may grow, plants, seed or soil to be protected from attack or infestation by said harmful insects and/or phytopathogenic fungi with an effective amount of the composition according to claims 1 to 10 or according to claims 15 or 16.
- 15 18. A method of controlling undesired vegetation, which comprises allowing a herbicidal effective amount of the composition according to claims 1 to 10 or according to claims 15 to 16 to act on plants, their habitat or on seed of said plants.
- 20 19. The method according to claim 18, wherein the plants are genetically modified crops, that are tolerant at least to auxins.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/063954

A. CLASSIFICATION OF SUBJECT MATTER

INV. A01N37/40 A01N57/20 A01N25/00
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A01N

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

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

EPO-Internal, WPI Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2010/331182 A1 (ZHANG HONG [US] ET AL) 30 December 2010 (2010-12-30) abstract paragraph [0019]; claims; example 3 -----	1-19
X	WO 2008/126933 A2 (SUMITOMO CHEMICAL CO [JP]; NOKURA YOSHIHIKO [JP]; IKEGAMI HIROSHI [JP]) 23 October 2008 (2008-10-23) page 1, line 6 - line 8; claims; examples 3,6 -----	1-19
X	US 2002/049140 A1 (HAMROLL BERND [DE] ET AL) 25 April 2002 (2002-04-25) claims 1,5; examples 1,3,5,11-13,15,16 ----- -/-	1-19



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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

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Date of the actual completion of the international search

3 August 2012

Date of mailing of the international search report

16/08/2012

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/063954

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2004 083415 A (SANKYO AGRO KK) 18 March 2004 (2004-03-18) paragraphs [0069], [0077], [0090], [0136], [0140]; claims; example 10 -----	1-19
X	JP 2007 284386 A (KUMIAI CHEMICAL INDUSTRY CO; IHARA CHEMICAL IND CO) 1 November 2007 (2007-11-01) paragraphs [0001], [0002]; claims; example 1 -----	1-19
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