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"Product Information Triton (TM) GR-7ME Surfactant", Dow Chemical Company , Retrieved from the Internet: URL:http://www.dow.com/scripts/litorder.as p?filepath=surfactants/pdfs/noreg/119-0210 8.pdf
"Contents / pages i-vi /chapter 7.34 'Oil-Based Suspension Concentrates (OD) (Oil Dispersion)'" In: FAO/WHO Joint Meeting on Pesticide Specifications (JMPS): "Manual on Development and Use of FAO and WHO Specifications for Pesticides, First Edition", 2002, F A O ROME pages p. 150-153,

Fortsættes ...

Description

The present invention relates to the field of crop protection compositions. In particular, the invention relates to liquid formulations in the form of oil suspension concentrates comprising herbicidally active compounds from the group of the sulfonamides, in particular the phenylsulfonamides and heteroarylsulfonamides.

In general, active compounds for crop protection are not employed in pure form. Depending on the area of use and the type of use, and on physical, chemical and biological parameters, the active compound is used as an active compound formulation in a mixture with customary auxiliaries and additives. Also known are combinations with further active compounds for widening the activity spectrum and/or for protecting crop plants (for example by safeners, antidotes).

In general, formulations of active compounds for crop protection should have high chemical and physical stability, should be easy to apply and easy to use and have broad biological action combined with high selectivity.

In general, herbicidally active compounds from the group of the sulfonamides, such as sulfonylureas, have high chemical reactivity and tend to be degraded chemically, for example by hydrolysis.

One possibility of formulating chemically unstable active compounds is the preparation of solid formulations. Thus, formulations of active compounds from the group of the sulfonylureas in the form of powders, granules and tablets are known (for example in EP 764404, WO 9834482, WO 9313658). However, the processes for preparing solid formulations, for example in the form of granules and tablets, are generally complicated, in particular when auxiliaries and additives or active compounds having a low melting point are incorporated. Moreover, solid formulations are generally more difficult to

apply and less user-friendly.

Liquid formulations of sulfonylureas are described, for example, in US 4599412, US 4683000, US 4671817, EP 0245058, WO 01/82693, EP 0313317, EP 0514768, EP 0163598 and EP 0514769.

EP 0514768, EP 0163598, EP 0514769 and JP 06 321713 A also describe some aqueous formulations of sulfonylureas.

US 4599412 describes liquid anhydrous formulations of sulfonamides which are emulsion concentrates (EC), and WO 01/82693 describes how to improve the poor solubility of sulfonylureas in the organic solvents of EC formulations using solubilizers such as, for example, sulfosuccinates.

WO 01/30156, EP 0313317 and JP 07 033612 A describe liquid anhydrous formulations of sulfonamides which are oil suspension concentrates and which use special dispersants to keep the finely divided active compound in suspension.

It was an object of the present invention to provide an improved formulation of crop protection agents, which formulation has high chemical stability and high biological effectiveness and crop plant compatibility.

This object is achieved by the specific oil suspension concentrate of the present invention.

Accordingly, the present invention relates to an oil suspension concentrate, comprising

a) one or more herbicidally active compounds from the group of the sulfonamides in suspended form,

b) one or more safeners,

c) one or more organic solvents, and

d) one or more sulfosuccinates, and

f) as customary auxiliaries and additives surfactants from the group of the nonionic emulsifiers and dispersants selected

from the group of polyethoxylated saturated and unsaturated aliphatic alcohols,
- having 8 to 24 carbon atoms in the alkyl radical which is derived from the corresponding fatty acids or from petrochemical products and
- having 1 to 100, preferably 2 to 50, ethylene oxide units (EO), where the free hydroxy group is optionally alkoxylated;
polyethoxylated arylalkylphenols, polyethoxylated alkylphenols having one or more alkyl radicals, polyethoxylated hydroxy fatty acids or glycerides comprising hydroxy fatty acids, polyethoxylated sorbitan esters and di- and tri-block copolymers; and optionally further customary auxiliaries and additives.

Furthermore, the oil suspension concentrate according to the invention may optionally also comprise, as further components:
e) one or more agrochemically active compounds different from a) and b).

The term "oil suspension concentrate" (OD) is to be understood as meaning a suspension concentrate based on organic solvents. Here, one or more active compounds are suspended in the organic solvent, further active compounds may be dissolved in the organic solvent.

In the oil suspension concentrate according to the invention, the sulfonamide a) is present in suspended form in the organic solvent in finely divided form, more than 80% by weight undissolved, based on the total amount of sulfonamide.

Preferred sulfonamides a) are phenylsulfonamides and heteroarylsulfonamides and other sulfonamides such as amidosulfuron. Suitable phenylsulfonamides a) are, for example, compounds from the group of the phenylsulfonylaminocarbonyltriazolinones or the phenylsulfonylureas, preferably from the group of the phenylsulfonylureas. The term "phenylsulfonylurea" is to be understood as including those sulfonylureas in which the

phenyl group is attached via a spacer such as CH_2, O or NH to the sulfone group (SO_2). Examples of phenylsulfonylaminocarbonyltriazolinones are flucarbazone or propoxycarbazone and/or salts thereof. The sulfonamides a) are commercially available and/or can be prepared by known processes, as described, for example, in EP-A-7687, EP-A-30138, US 5,057,144 and US 5,534,486.

Suitable phenylsulfonamides are, for example, phenylsulfonamides of the formula (I) and/or salts thereof

$$R^{\alpha}-(A)_m-SO_2-NR^{\beta}-CO-(NR^{\gamma})_n - R^{\delta} \qquad (I)$$

in which

R^{α} is an unsubstituted or substituted phenyl radical, where the phenyl radical including substituents has 1-30 carbon atoms, preferably 1-20 carbon atoms,

R^{β} is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

R^{γ} is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

A is CH_2, O or NH, preferably O,

m is zero or 1,

n is zero or 1, preferably 1, and

R^{δ} is a heterocyclic radical, such as a pyridyl radical, a triazinyl radical or a triazolinone radical.

Preferred phenylsulfonamides are phenylsulfonylureas, for example phenylsulfonylureas of the formula (II) and/or salts thereof

$$R^{\alpha}-(A)_m-SO_2-NR^{\beta}-CO-NR^{\gamma} - R^{\delta} \qquad (II)$$

in which

R^{α} is an unsubstituted or substituted phenyl radical, where the phenyl radical including substituents has 1-30 carbon atoms, preferably 1-20 carbon atoms,

R^{β} is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

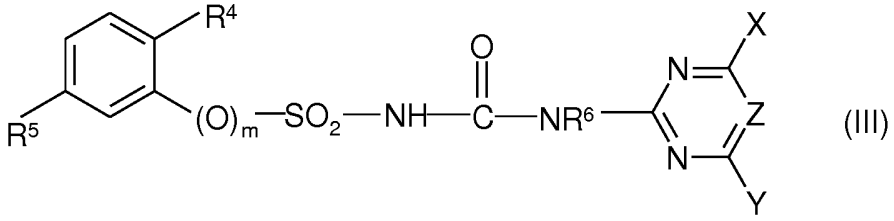
R^{γ} is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

A is CH_2, O or NH, preferably O,

m is zero or 1, and

R^{δ} is a heterocyclic radical, such as a pyridyl radical or a triazinyl radical.

Preference is given to phenylsulfonylureas of the formula (III) and/or salts thereof



(III)

in which

R^4 is C_1-C_4-alkoxy, preferably C_2-C_4-alkoxy, or CO-R^a, where R^a is OH, C_1-C_4-alkoxy or NR^bR^c, where R^b and R^c are identical or different and independently of one another are H or C_1-C_4-alkyl,

R^5 is halogen, preferably iodine, or $(A)_n$-NR^dR^e, where n is zero or 1, A is a group CR'R", where R' and R" are identical or different and independently of one another are H or C_1-C_4-alkyl, R^d is H or C_1-C_4-alkyl and R^e is an acyl radical, such as formyl, or C_1-C_4-alkylsulfonyl, and if R^4 is C_1-C_4-alkoxy, preferably C_2-C_4-alkoxy, R^5 may also be H,

R^6 is H or C_1-C_4-alkyl,

m is zero or 1,

X and Y are identical or different and independently of one another are halogen or NR'R'', where R' and R'' are identical

or different and are H or C_1-C_4-alkyl, or C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_3-C_6-cycloalkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_6-alkenyloxy or C_3-C_6-alkynyloxy, where each of the eight lastmentioned radicals is unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1-C_4-alkoxy and C_1-C_4-alkylthio, preferably C_1-C_4-alkyl or C_1-C_4-alkoxy, and

Z is CH or N.

Particular preference is given to phenylsulfonylureas of the formula (III) and/or salts thereof, in which

a) R^4 is CO-(C_1-C_4-alkoxy), R^5 is halogen, preferably iodine, or R^5 is CH_2-NHR^e, where R^e is an acyl radical, preferably C_1-C_4-alkylsulfonyl, and m is zero,

b) R^4 is CO-N(C_1-C_4-alkyl)$_2$, R^5 is NHR^e , where R^e is an acyl radical, preferably formyl, and m is zero, or

c) R^4 is C_2-C_4-alkoxy, R^5 is H and m is 1.

Typical phenylsulfonylureas are, inter alia, the compounds listed below and their salts, such as the sodium salts: bensulfuron-methyl, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethametsulfuron-methyl, ethoxysulfuron and its sodium salt, metsulfuron-methyl, oxasulfuron, primisulfuron-methyl, prosulfuron, sulfometuron-methyl, triasulfuron, tribenuron-methyl, triflusulfuron-methyl, tritosulfuron, iodosulfuron-methyl and its sodium salt (WO 92/13845), mesosulfuron-methyl and its sodium salt (Agrow No. 347, March 3, 2000, page 22 (PJB Publications Ltd. 2000)) and foramsulfuron and its sodium salt (Agrow No. 338, October 15, 1999, page 26 (PJB Publications Ltd. 1999)).

Particularly preferred phenylsulfonamides are: iodosulfuron-methyl (A1.1) and its sodium salt (A1.2), mesosulfuron-methyl (A2.1) and its sodium salt (A2.2), foramsulfuron (A3.1) and its sodium salt (A3.2), flucarbazone (A4.1) and its sodium salt (A4.2), propoxycarbazone (A5.1) and its sodium salt (A5.2) and ethoxysulfuron (A6.1) and its sodium salt (A6.2), metsulfuron-methyl (A7.1) and its sodium salt (A7.2),

tribenuron-methyl (A8.1) and its sodium salt (A8.2), chlorsulfuron (A9.1) and its sodium salt (A9.2).

The active compounds listed above are known, for example, from "The Pesticide Manual", 12th edition (2000), The British Crop Protection Council, or the literature references given after the individual active compounds.

Suitable heteroarylsulfonamides a) are, for example, compounds from the group of the heteroarylsulfonylaminocarbonyltriazolinones or the heteroarylsulfonylureas, preferably from the group of the heteroarylsulfonylureas. The term "heteroarylsulfonylureas" is to be understood as including those sulfonylureas in which the heteroaryl group is attached via a spacer such as CH_2, O or NH to the sulfone group (SO_2).

Suitable heteroarylsulfonamides are, for example, sulfonamides of the formula (IV) and/or salts thereof,

$$R^{\alpha'}-(A')_{m'}-SO_2-NR^{\beta'}-CO-(NR^{\gamma'})_{n'}-R^{\delta'} \qquad (IV)$$

in which

$R^{\alpha'}$ is an unsubstituted or substituted heteroaryl radical, where the heteroaryl radical including substituents has 1-30 carbon atoms, preferably 1-20 carbon atoms,

$R^{\beta'}$ is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

$R^{\gamma'}$ is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

A' is CH_2, O or NH, preferably O,

m' is zero or 1,

n' is zero or 1, preferably 1, and

$R^{\delta'}$ is a heterocyclic radical, such as a pyridyl radical,

a triazinyl radical or a triazolinone radical.

Preferred heteroarylsulfonamides are heteroarylsulfonylureas, for example sulfonylureas of the formula (V) and/or salts thereof,

$R^{\alpha'}-(A')_{m'}-SO_2-NR^{\beta'}-CO-NR^{\gamma'}-R^{\delta'}$ (V)

in which

$R^{\alpha'}$ is an unsubstituted or substituted heteroaryl radical, where the heteroaryl radical including substituents has 1-30 carbon atoms, preferably 1-20 carbon atoms,

$R^{\beta'}$ is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

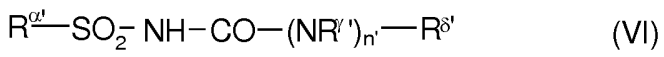
$R^{\gamma'}$ is a hydrogen atom or an unsubstituted or substituted hydrocarbon radical which, including substituents, has 1-10 carbon atoms, for example unsubstituted or substituted C_1-C_6-alkyl, preferably a hydrogen atom or methyl,

A' is CH_2, O or NH, preferably O,

m' is zero or 1, and

$R^{\delta'}$ is a heterocyclic radical, such as a pyridyl radical or a triazinyl radical.

Particular preference is given to heteroarylsulfonamides of the formula (VI) below



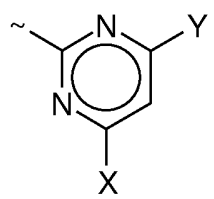
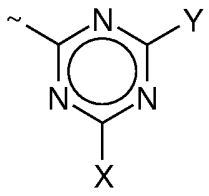
(VI)

in which

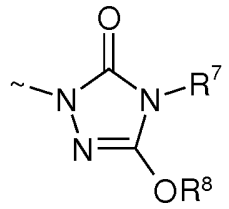
$R^{\alpha'}$ is a substituted heteroaryl radical such as substituted pyridyl, thienyl, pyrazolyl or imidazolyl,

$R^{\gamma'}$ is H, (C_1-C_3)-alkyl, unsubstituted or substituted by halogen (F, C, Br, I) or halo-(C_1-C_3)-alkoxy, preferably H or methyl,

for n' = 1, $R^{\delta'}$ is a pyridyl radical or a triazinyl radical, preferably

and for n' = zero, R^{δ}' is a triazolinone radical, preferably



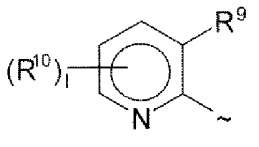
,

R^7 is (C_1-C_{10})-alkyl, which is unsubstituted or substituted by halogen (F, Cl, Br, I) or halo-(C_1-C_3)-alkyl,

R^8 is (C_1-C_{10})-alkyl, which is unsubstituted or substituted by halogen (F, Cl, Br, I) or halo-(C_1-C_3)-alkyl,

X and Y are identical or different and independently of one another are halogen or NR'R'', where R' and R'' are identical or different and are H or C_1-C_4-alkyl, or C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_3-C_6-cycloalkyl, C_2-C_6-alkenyl, C_2-C_6-alkynyl, C_3-C_6-alkenyloxy or C_3-C_6-alkynyloxy, where each of the eight lastmentioned radicals is unsubstituted or substituted by one or more radicals from the group consisting of halogen, C_1-C_4-alkoxy and C_1-C_4-alkylthio, preferably C_1-C_4-alkyl or C_1-C_4-alkoxy.

Particularly preferably, R^{α}' is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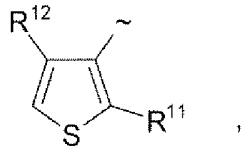
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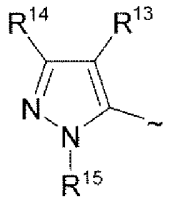
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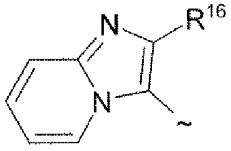


in which

R^9 is (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_2-C_6)-alkenyloxy, (C_2-C_6)-alkynyloxy, (C_1-C_6)-alkylsulfonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_6)-alkoxycarbonyl,

(C_2-C_6)-alkenyloxycarbonyl, (C_2-C_6)-alkynyloxycarbonyl, CONR'R'', halo-(C_1-C_6)-alkyl, halo-(C_1-C_6)-alkoxy, halo-(C_2-C_6)-alkenyloxy, halo-(C_2-C_6)-alkynyloxy, halo-(C_1-C_6)-alkylsulfonyl, halo-(C_1-C_6)-alkylcarbonyl, halo-(C_1-C_6)-alkoxycarbonyl, halo-(C_2-C_6)-alkenyloxycarbonyl, halo-(C_2-C_6)-alkynyloxycarbonyl,

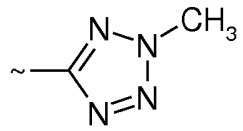
R^{10} is H, (C_1-C_3)-alkyl, (C_1-C_3)-alkoxy, halo-(C_1-C_3)-alkyl, halo-(C_1-C_3)-alkoxy or halogen (F, Cl, Br, I),

l is zero or 1,

R^{11} is (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_2-C_6)-alkenyloxy, (C_2-C_6)-alkynyloxy, (C_1-C_6)-alkylsulfonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_6)-alkoxycarbonyl, (C_2-C_6)-alkenyloxycarbonyl, (C_2-C_6)-alkynyloxycarbonyl, halo-(C_1-C_6)-alkyl, halo-(C_1-C_6)-alkoxy, halo-(C_2-C_6)-alkenyloxy, halo-(C_2-C_6)-alkynyloxy, halo-(C_1-C_6)-alkylsulfonyl, halo-(C_1-C_6)-alkylcarbonyl, halo-(C_1-C_6)-alkoxycarbonyl, halo-(C_2-C_6)-alkenyloxycarbonyl, halo-(C_2-C_6)-alkynyloxycarbonyl, CONR'R'',

R^{12} is halogen (F, Cl, Br, I), (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_1-C_6)-alkylsulfonyl, (C_1-C_6)-alkoxycarbonyl, (C_2-C_6)-alkenyloxycarbonyl, (C_2-C_6)-alkynyloxycarbonyl, halo-(C_1-C_6)-alkyl, halo-(C_1-C_6)-alkoxy, halo-(C_1-C_6)-alkylsulfonyl, halo-(C_1-C_6)-alkoxycarbonyl, halo-(C_2-C_6)-alkenyloxycarbonyl, halo-(C_2-C_6)-alkynyloxycarbonyl,

R^{13} is (C_1-C_6)-alkoxycarbonyl, (C_2-C_6)-alkenyloxycarbonyl, (C_2-C_6)-alkynyloxycarbonyl, (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_1-C_6)-alkylsulfonyl, halo-(C_1-C_6)-alkoxycarbonyl, halo-(C_2-C_6)-alkenyloxycarbonyl, halo-(C_2-C_6)-alkynyloxycarbonyl, halo-(C_1-C_6)-alkyl, halo-(C_1-C_6)-alkoxy, halo-(C_1-C_6)-alkylsulfonyl, halogen (F, Cl, Br, I), CONR'R'', or R^{13} is a heterocyclic ring, which may be saturated, unsaturated or aromatic and which preferably contains 4-6 ring atoms and one or more heteroatoms from the group consisting of N, O and S and which may be unsubstituted or substituted by one or more substituents, preferably from the group consisting of (C_1-C_3)-alkyl, (C_1-C_3)-alkoxy, halo-(C_1-C_3)-alkyl, halo-(C_1-C_3)-alkoxy and halogen, particularly preferably



R^{14} is H, halogen (F, C, Br, I), (C_1-C_6)-alkyl, halo-(C_1-C_6)-alkyl,

R^{15} is H, (C_1-C_6)-alkyl, halo-(C_1-C_6)-alkyl,

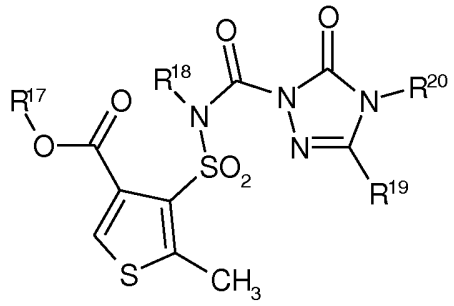
R^{16} is (C_1-C_6)-alkyl, (C_1-C_6)-alkoxy, (C_2-C_6)-alkenyloxy, (C_2-C_6)-alkynyloxy, (C_1-C_6)-alkylsulfonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_6)-alkoxycarbonyl, (C_2-C_6)-alkenyloxycarbonyl, (C_2-C_6)-alkynyloxycarbonyl, halo-(C_1-C_6)-alkyl, halo-(C_1-C_6)-alkoxy, halo-(C_2-C_6)-alkenyloxy, halo-(C_2-C_6)-alkynyloxy, halo-(C_1-C_6)-alkylsulfonyl, halo-(C_1-C_6)-alkylcarbonyl, halo-(C_1-C_6)-alkoxycarbonyl, halo-(C_2-C_6)-alkenyloxycarbonyl, halo-(C_2-C_6)-alkynyloxycarbonyl, $CONR'R''$, in particular SO_2-ethyl, and

R‘ and R‘‘ independently of one another are H, (C_1-C_6)-alkyl, halo-(C_1-C_6)-alkyl, (C_2-C_6)-alkenyl, (C_2-C_6)-haloalkenyl, (C_2-C_6)-alkynyl, (C_2-C_6)-haloalkynyl, or $NR'R''$ forms a heterocyclic ring which may be saturated, unsaturated or aromatic and which preferably contains 4-6 ring atoms and one or more heteroatoms from the group consisting of N, O and S and which may be unsubstituted or substituted by one or more substituents, preferably from the group consisting of (C_1-C_3)-alkyl, (C_1-C_3)-alkoxy, halo-(C_1-C_3)-alkyl, halo-(C_1-C_3)-alkoxy and halogen.

Particularly preferred heteroarylsulfonylureas are, for example, nicosulfuron (A10.1) and its salts, such as the sodium salt (A10.2), rimsulfuron (A11.1) and its salts, such as the sodium salt (A11.2), thifensulfuron-methyl (A12.1) and its salts, such as the sodium salt (A12.2), pyrazosulfuron-ethyl (A13.1) and its salts, such as the sodium salt (A13.2), flupyrsulfuron-methyl (A14.1) and its salts, such as the sodium salt (A14.2), sulfosulfuron (A15.1) and its salts, such as the sodium salt (A15.2), trifloxysulfuron (A16.1) and its salts, such as the sodium salt (A16.2), azimsulfuron (A17.1) and its salts, such as the sodium salt (A17.2), flazasulfuron (A18.1) and its salts, such as the sodium salt (A18.2), and

flucetosulfuron (1-[3-[[[[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]-2-pyridinyl]-2-fluoropropyl methoxyacetate, (A19.1)) and its salts, such as the sodium salt (A 19.2).

Particularly preferred heteroarylsulfonylaminocarbonyltriazolinones are the compounds of the formula (VII) mentioned below which are known, for example, from WO 03/026427.



(VII)

Compound No.	R^{17}	R^{18}	R^{19}	R^{20}
A20.1	CH_3	H	OC_2H_5	CH_3
A20.2	CH_3	Na	OC_2H_5	CH_3
A21.1	CH_3	H	OCH_3	CH_3
A21.2	CH_3	Na	OCH_3	CH_3
A22.1	CH_3	H	OC_3H_7-n	CH_3
A22.2	CH_3	Na	OC_3H_7-n	CH_3
A23.1	CH_3	H	OC_3H_7-i	CH_3
A23.2	CH_3	Na	OC_3H_7-i	CH_3
A24.1	CH_3	H	OCH_3	cyclopropyl
A24.2	CH_3	Na	OCH_3	cyclopropyl
A25.1	CH_3	H	OC_2H_5	cyclopropyl
A25.2	CH_3	Na	OC_2H_5	cyclopropyl
A26.1	CH_3	H	OC_3H_7-n	cyclopropyl
A26.2	CH_3	Na	OC_3H_7-n	cyclopropyl
A27.1	CH_3	H	OC_3H_7-i	cyclopropyl
A27.2	CH_3	Na	OC_3H_7-i	cyclopropyl
A28.1	CH_3	H	cyclopropyl	cyclopropyl
A28.2	CH_3	Na	cyclopropy	cyclopropyl

Compound No.	R^{17}	R^{18}	R^{19}	R^{20}
			l	
A29.1	CH_3	H	CH_3	CH_3
A29.2	CH_3	Na	CH_3	CH_3
A30.1	CH_3	H	C_2H_5	CH_3
A30.2	CH_3	Na	C_2H_5	CH_3
A31.1	CH_3	H	SCH_3	CH_3
A31.2	CH_3	Na	SCH_3	CH_3
A32.1	CH_3	H	OCH_3	CH_3
A32.2	CH_3	Na	OCH_3	CH_3
A33.1	CH_3	H	CH_2OCH_3	cyclopropyl
A33.2	CH_3	Na	CH_2OCH_3	cyclopropyl
A34.1	CH_3	H	OC_2H_5	CH_3
A34.2	CH_3	Na	OC_2H_5	CH_3
A35.1	CH_3	H	OCH_3	cyclopropyl
A35.2	CH_3	Na	OCH_3	cyclopropyl
A36.1	CH_3	H	C_2H_5	OC_2H_5
A36.2	CH_3	Na	C_2H_5	OC_2H_5
A37.1	CH_3	H	C_2H_5	cyclopropyl
A37.2	CH_3	Na	C_2H_5	cyclopropyl

The active compounds listed above are known, for example, from "The Pesticide Manual", 12th edition (2000) (PM) and 13th edition (2003), The British Crop Protection Council or the literature references given after the individual active compounds.

For the purpose of the present invention, the sulfonamides a) contained as a component in the oil suspension concentrates according to the invention are in each case to be understood as meaning all use forms, such as acids, esters, salts and isomers, such as stereoisomers and optical isomers. Thus, in addition to neutral compounds, their salts with inorganic and/or organic counterions are in each case meant to be included. Thus, sulfonamides are capable of forming salts, for example, in which the hydrogen of the $-SO_2-NH$ group is replaced by an agriculturally suitable cation. These salts are, for example, metal salts, in particular alkali metal salts or

alkaline earth metal salts, in particular sodium and potassium salts, or else ammonium salts or salts with organic amines. Salt formation may also take place by addition of an acid to basic groups, such as, for example, amino and alkylamino. Acids suitable for this purpose are strong inorganic and organic acids, for example HCl, HBr, H_2SO_4 or HNO_3. Preferred esters are the alkyl esters, in particular the C_1-C_{10}-alkyl esters, such as methyl esters.

Whenever the term "acyl radical" is used in this description, this means the radical of an organic acid which is formally formed by removing an OH group from the organic acid, for example the radical of a carboxylic acid and radicals of acids derived therefrom, such as thiocarboxylic acid, unsubstituted or N-substituted iminocarboxylic acids or the radicals of carbonic monoesters, unsubstituted or N-substituted carbaminic acids, sulfonic acids, sulfinic acids, phosphonic acids, phosphinic acids.

An acyl radical is preferably formyl or acyl from the group consisting of CO-R^z, CS-R^z, CO-OR^z, CS-OR^z, CS-SR^z, SOR^z and SO_2R^z, where R^z is in each case a C_1-C_{10}-hydrocarbon radical, such as C_1-C_{10}-alkyl or C_6-C_{10}-aryl, which is unsubstituted or substituted, for example by one or more substituents from the group consisting of halogen, such as F, Cl, Br, I, alkoxy, haloalkoxy, hydroxyl, amino, nitro, cyano and alkylthio, or R^z is aminocarbonyl or aminosulfonyl, where the two lastmentioned radicals are unsubstituted, N-monosubstituted or N,N-disubstituted, for example by substituents from the group consisting of alkyl and aryl.
Acyl is, for example, formyl, haloalkylcarbonyl, alkylcarbonyl, such as (C_1-C_4)-alkylcarbonyl, phenylcarbonyl, where the phenyl ring may be substituted, or alkyloxycarbonyl, such as (C_1-C_4)-alkyloxycarbonyl, phenyloxycarbonyl, benzyloxycarbonyl, alkylsulfonyl, such as (C_1-C_4)-alkylsulfonyl, alkylsulfinyl, such as C_1-C_4-(alkylsulfinyl), N-alkyl-1-iminoalkyl, such as N-(C_1-C_4)-1-imino-(C_1-C_4)-alkyl, and other radicals of organic acids.

A hydrocarbon radical is a straight-chain, branched or cyclic and saturated or unsaturated aliphatic or aromatic hydrocarbon radical, for example alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl or aryl.
A hydrocarbon radical has preferably 1 to 40 carbon atoms, with preference 1 to 30 carbon atoms; with particular preference, a hydrocarbon radical is alkyl, alkenyl or alkynyl having up to 12 carbon atoms or cycloalkyl having 3, 4, 5, 6 or 7 ring atoms or phenyl.

Aryl is a mono-, bi- or polycyclic aromatic system, for example phenyl, naphthyl, tetrahydronaphthyl, indenyl, indanyl, pentalenyl, fluorenyl and the like, preferably phenyl.

A heterocyclic radical or ring (heterocyclyl) can be saturated, unsaturated or heteroaromatic and unsubstituted or substituted; it preferably contains one or more heteroatoms in the ring, preferably from the group consisting of N, O and S; it is preferably an aliphatic heterocyclyl radical having 3 to 7 ring atoms or a heteroaromatic radical having 5 or 6 ring atoms and contains 1, 2 or 3 heteroatoms. The heterocyclic radical can, for example, be a heteroaromatic radical or ring (heteroaryl), such as, for example, a mono-, bi- or polycyclic aromatic system in which at least one ring contains one or more heteroatoms, for example pyridyl, pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, thienyl, thiazolyl, oxazolyl, furyl, pyrrolyl, pyrazolyl and imidazolyl, or it is a partially or fully hydrogenated radical, such as oxiranyl, oxetanyl, pyrrolidyl, piperidyl, piperazinyl, triazolyl, dioxolanyl, morpholinyl, tetrahydrofuryl. Preference is given to pyrimidinyl and triazinyl. Suitable substituents for a substituted heterocyclic radical are the substituents mentioned further below, and additionally also oxo. The oxo group may also be present at the hetero ring atoms, which may exist in different oxidation states, for example in the case of N and S.

Substituted radicals, such as substituted hydrocarbon radicals, for example substituted alkyl, alkenyl, alkynyl, aryl, phenyl and benzyl, or substituted heterocyclyl or heteroaryl, are, for example, a substituted radical which is derived from an unsubstituted parent compound, where the substituents are, for example, one or more, preferably 1, 2 or 3, radicals from the group consisting of halogen, alkoxy, haloalkoxy, alkylthio, hydroxyl, amino, nitro, carboxyl, cyano, azido, alkoxycarbonyl, alkylcarbonyl, formyl, carbamoyl, mono- and dialkylaminocarbonyl, substituted amino, such as acylamino, mono- and dialkylamino, and alkylsulfinyl, haloalkylsulfinyl, alkylsulfonyl, haloalkylsulfonyl and, in the case of cyclic radicals, also alkyl and haloalkyl, and unsaturated aliphatic radicals which correspond to the saturated hydrocarbon-containing radicals mentioned, such as alkenyl, alkynyl, alkenyloxy, alkynyloxy, etc. Among the radicals with carbon atoms, preference is given to those having 1 to 4 carbon atoms, in particular 1 or 2 carbon atoms. Preference is generally given to substituents from the group consisting of halogen, for example fluorine and chlorine, (C_1-C_4)-alkyl, preferably methyl or ethyl, (C_1-C_4)-haloalkyl, preferably trifluoromethyl, (C_1-C_4)-alkoxy, preferably methoxy or ethoxy, (C_1-C_4)-haloalkoxy, nitro and cyano. Particular preference is given here to the substituents methyl, methoxy and chlorine.

Unsubstituted or substituted phenyl is preferably phenyl which is unsubstituted or mono- or polysubstituted, preferably substituted up to three times, by identical or different radicals, preferably from the group consisting of halogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy and nitro, for example o-, m- and p-tolyl, dimethylphenyl, 2-, 3- and 4-chlorophenyl, 2-, 3- and 4-trifluoro- and -trichlorophenyl, 2,4-, 3,5-, 2,5- and 2,3-dichlorophenyl, o-, m- and p-methoxyphenyl.

Cycloalkyl is a carbocyclic saturated ring system having

preferably 3-6 carbon atoms, for example cyclopropyl, cyclobutyl, cyclopentyl or cyclohexyl.

The carbon skeleton of the carbon-containing radicals, such as alkyl, alkoxy, haloalkyl, haloalkoxy, alkylamino and alkylthio and the corresponding unsaturated and/or substituted radicals in each case be straight-chain or branched. In these radicals, preference is given to the lower carbon skeletons having, for example, 1 to 6 carbon atoms and, in the case of unsaturated groups, 2 to 6 carbon atoms, unless specified otherwise. Alkyl radicals, also in the composite meanings such as alkoxy, haloalkyl, etc., are, for example, methyl, ethyl, n- or isopropyl, n-, iso-, t- or 2-butyl, pentyls, hexyls, such as n-hexyl, isohexyl and 1,3-dimethylbutyl, heptyls, such as n-heptyl, 1-methylhexyl and 1,4-dimethylpentyl; alkenyl and alkynyl radicals have the meaning of the possible unsaturated radicals which correspond to the alkyl radicals; alkenyl is, for example, allyl, 1-methylprop-2-en-1-yl, 2-methyl-prop-2-en-1-yl, but-2-en-1-yl, but-3-en-1-yl, 1-methyl-but-3-en-1-yl and 1-methyl-but-2-en-1-yl; alkynyl is, for example, propargyl, but-2-yn-1-yl, but-3-yn-1-yl, 1-methyl-but-3-yn-1-yl.

Halogen is, for example, fluorine, chlorine, bromine or iodine. Haloalkyl, -alkenyl and -alkynyl is alkyl, alkenyl and alkynyl, respectively, which is partially or fully substituted by halogen, preferably by fluorine, chlorine and/or bromine, in particular by fluorine or chlorine, for example CF_3, CHF_2, CH_2F, CF_3CF_2, CH_2FCHCl, CCl_3, $CHCl_2$, CH_2CH_2Cl; haloalkoxy is, for example, OCF_3, $OCHF_2$, OCH_2F, CF_3CF_2O, OCH_2CF_3 and OCH_2CH_2Cl; this applies correspondingly to haloalkenyl and other halogen-substituted radicals.

The oil suspension concentrates according to the invention comprise the herbicidally active compounds a) from the group of the sulfonamides in general in amounts of from 0.01 to 50% by weight, preferably from 0.1 to 30% by weight; here and in the entire description, the term "% by weight" refers to the

relative weight of the component in question based on the total weight of the formulation, unless defined otherwise.

The oil suspension concentrates according to the invention comprise, as component b), safeners which are suitable for reducing or preventing damage to the crop plant. Suitable safeners are known, for example, from WO-A-96/14747 and the literature cited therein. In the organic solvent, the safeners can be present in suspended and/or dissolved form, preferably in dissolved form.

Suitable safeners are, for example, the following groups of compounds:

1) Compounds of the type of dichlorophenylpyrazoline-3-carboxylic acid (S1), preferably compounds such as ethyl 1-(2,4-dichlorophenyl)-5-(ethoxy-carbonyl)-5-methyl-2-pyrazoline-3-carboxylate (S1-1, mefenpyr-diethyl, PM pp. 781-782), and related compounds, as described in WO 91/07874.

2) Derivatives of dichlorophenylpyrazolecarboxylic acid, preferably compounds such as ethyl 1-(2,4-dichlorophenyl)-5-methylpyrazole-3-carboxylate (S1-2), ethyl 1-(2,4-dichlorophenyl)-5-isopropylpyrazole-3-carboxylate (S1-3), ethyl 1-(2,4-dichlorophenyl)-5-(1,1-dimethylethyl)-pyrazole-3-carboxylate (S1-4), ethyl 1-(2,4-dichlorophenyl)-5-phenylpyrazole-3-carboxylate (S1-5) and related compounds, as described in EP-A-333 131 and EP-A-269 806.

3) Compounds of the type of the triazolecarboxylic acids (S1), preferably compounds such as fenchlorazole, i.e. ethyl 1-(2,4-dichlorophenyl)-5-trichloromethyl-(1H)-1,2,4-triazole-3-carboxylate (S1-6, fenchlorazole-ethyl, PM pp. 385-386), and related compounds (see EP-A-174 562 and EP-A-346 620).

4) Compounds of the type of the 5-benzyl- or 5-phenyl-2-isoxazoline-3-carboxylic acid, or the 5,5-diphenyl-2-isoxazoline-3-carboxylic acid, preferably compounds such as ethyl 5-(2,4-dichlorobenzyl)-2-isoxazoline-3-carboxylate (S1-7) or ethyl 5-phenyl-2-isoxazoline-3-carboxylate (S1-8) and related compounds, as described in WO 91/08202, or ethyl

5,5-diphenyl-2-isoxazolinecarboxylate (S1-9, isoxadifen-ethyl) or n-propyl ester (S1-10) or ethyl 5-(4-fluorophenyl)-5-phenyl-2-isoxazoline-3-carboxylate (S1-11), as described in the patent application (WO-A-95/07897).

5) Compounds of the type of the 8-quinolineoxyacetic acid (S2), preferably
1-methylhex-1-yl (5-chloro-8-quinolineoxy)acetate (S2-1, cloquintocet-mexyl, PM pp. 263-264),
1,3-dimethylbut-1-yl (5-chloro-8-quinolineoxy)acetate (S2-2),
4-allyloxybutyl (5-chloro-8-quinolineoxy)acetate (S2-3),
1-allyloxyprop-2-yl (5-chloro-8-quinolineoxy)acetate (S2-4),
ethyl (5-chloro-8-quinolineoxy)acetate (S2-5),
methyl (5-chloro-8-quinolineoxy)acetate (S2-6),
allyl (5-chloro-8-quinolineoxy)acetate (S2-7),
2-(2-propylideneiminooxy)-1-ethyl
(5-chloro-8-quinolineoxy)acetate (S2-8),
2-oxoprop-1-yl (5-chloro-8-quinolineoxy)acetate (S2-9)
and related compounds, as described in EP-A-86 750, EP-A-94 349 and EP-A-191 736 or EP-A-0 492 366.

6) Compounds of the type of the (5-chloro-8-quinolineoxy)malonic acid, preferably compounds such as diethyl (5-chloro-8-quinolineoxy)malonate, diallyl (5-chloro-8-quinolineoxy)malonate, methyl ethyl (5-chloro-8-quinolineoxy)malonate and related compounds, as described in EP-A-0 582 198.

7) Active compounds of the type of the phenoxyacetic or -propionic acid derivatives or the aromatic carboxylic acids, such as, for example, 2,4-dichlorophenoxyacetic acid (esters) (2,4-D), 4-chloro-2-methylphenoxypropionic esters (mecoprop), MCPA or 3,6-dichloro-2-methoxybenzoic acid (esters) (dicamba).

8) Active compounds of the type of the pyrimidines, such as "fenclorim" (PM, pp. 512-511) (= 4,6-dichloro-2-phenylpyrimidine).

9) Active compounds of the type of the dichloroacetamides, which are frequently used as pre-emergence safeners (soil-acting safeners), such as, for example, "dichlormid" (PM, pp. 363-364 (= N,N-diallyl-2,2-dichloroacetamide),

"R-29148" (= 3-dichloroacetyl-2,2,5-trimethyl-1,3-oxazolidone from Stauffer),
"benoxacor" (PM, pp. 102-103) (= 4-dichloroacetyl-3,4-dihydro-3-methyl-2H-1,4-benzoxazine),
"PPG-1292" (= N-allyl-N-[(1,3-dioxolan-2-yl)methyl]dichloroacetamide from PPG Industries),
"DK-24" (= N-allyl-N-[(allylaminocarbonyl)methyl]dichloroacetamide from Sagro-Chem),
"AD-67" or "MON 4660" (= 3-dichloroacetyl-1-oxa-3-azaspiro[4,5]decane from Nitrokemia or Monsanto),
"dicyclonon" or "BAS145138" or "LAB145138" (=(= 3-dichloroacetyl-2,5,5-trimethyl-1,3-diazabiclyco[4.3.0]nonane from BASF) and
"furilazol" or "MON 13900" (see PM, 637-638) (= (RS)-3-dichloroacetyl-5-(2-furyl)-2,2-dimethyloxazolidone).

10) Active compounds of the type of the dichloroacetone derivatives, such as, for example,
"MG 191" (CAS-Reg. No. 96420-72-3) (= 2-dichloromethyl-2-methyl-1,3-dioxolane from Nitrokemia).

11) Active compounds of the type of the oxyimino compounds, which are known as seed dressings, such as, for example,
"oxabetrinil" (PM, pp. 902-903) (= (Z)-1,3-dioxolan-2-ylmethoxyimino(phenyl)acetonitrile), which is known as seed dressing safener against metolachlor damage,
"fluxofenim" (PM, pp. 613-614) (= 1-(4-chlorophenyl)-2,2,2-trifluoro-1-ethanone O-(1,3-dioxolan-2-ylmethyl) oxime which is known as seed dressing safener against metolachlor damage, and
"cyometrinil" or "CGA-43089" (PM, p. 1304) (= (Z)-cyanomethoxyimino(phenyl)acetonitrile), which is known as seed dressing safener against metolachlor damage.

12) Active compounds of the type of the thiazolecarboxylic esters, which are known as seed dressings, such as, for example,
"flurazole" (PM, pp. 590-591) (= benzyl 2-chloro-4-trifluoromethyl-1,3-thiazole-5-carboxylate), which is known as

seed dressing safener against alachlor and metolachlor damage.

13) Active compounds of the type of the naphthalenedicarboxylic acid derivatives, which are known as seed dressings, such as, for example,

"naphthalic anhydride" (PM, p. 1342) (= 1,8-naphthalenedicarboxylic anhydride), which is known as seed dressing safener for corn against thiocarbamate herbicide damage.

14) Active compounds of the type of the chromanacetic acid derivatives, such as, for example,

"CL 304415" (CAS-Reg. No. 31541-57-8) (= 2-84-carboxychroman-4-yl)acetic acid from American Cyanamid).

15) Active compounds which, in addition to a herbicidal action against harmful plants, also have safener action on crop plants such as, for example,

"dimepiperate" or "MY-93" (PM, pp. 404-405) (= S-1-methyl-1-phenylethyl piperidine-1-thiocarboxylate),

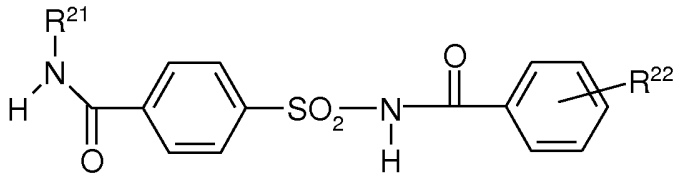
"daimuron" or "SK 23" (PM, p. 330) (= 1-(1-methyl-1-phenylethyl)-3-p-tolylurea),

"cumyluron" = "JC-940" (= 3-(2-chlorophenylmethyl)-1-(1-methyl-1-phenylethyl)urea, see JP-A-60087254),

"methoxyphenone" or "NK 049" (= 3,3'-dimethyl-4-methoxybenzophenone),

"CSB" (= 1-bromo-4-(chloromethylsulfonyl)benzene) (CAS-Reg No. 5409106-4 from Kumiai).

Compounds of the type of the acylsulfamoylbenzamides, for example of formula (VIII) below, which are known, for example, from WO 99/16744.



(VIII)

Compound No.	R^{21}	R^{22}
S3-1	cyclopropyl	2-OCH_3
S3-2	cyclopropyl	2-OCH_3, 5-Cl

S3-3	ethyl	2-OCH_3
S3-4	isopropyl	2-OCH_3, 5-Cl
S3-5	isopropyl	2-OCH_3

Preferred safeners are mefenpyr, fenchlorazole, isoxadifen, cloquintocet and their C_1-C_{10}-alkyl esters, in particular mefenpyr-diethyl (S1-1), fenchlorazole-ethyl (S1-6), isoxadifen-ethyl (S1-9), cloquintocet-mexyl (S2-1) and (S3-1).

The oil suspension concentrates according to the invention generally comprise the safeners b) in amounts of from 0.1 to 60% by weight, in particular from 2 to 40% by weight.

The weight ratio of component a) to component b) can vary within a wide range and is generally between 1:100 and 100:1, preferably between 1:10 and 10:1.

Suitable agrochemically active compounds e), which may be present or not, are, for example, agrochemically active compounds different from components a) and b), such as herbicides, fungicides, insecticides, plant growth regulators and the like. The agrochemically active compounds e) can be present in the organic solvent in suspended and/or dissolved form.

Suitable active compounds different from components a) and b) and optionally present as component e) in the oil suspension concentrates according to the invention are preferably herbicidally active compounds, for example:

A) herbicides of the type of the phenoxyphenoxy- and heteroaryloxyphenoxycarboxylic acid derivatives, such as

A1) phenoxyphenoxy- and benzyloxyphenoxycarboxylic acid derivatives, for example methyl 2-(4-(2,4-dichlorophenoxy)phenoxy)propionate (diclofop-methyl),
methyl 2-(4-(4-bromo-2-chlorophenoxy)phenoxy)propionate (DE-A 26 01 548),
methyl 2-(4-(4-bromo-2-fluorophenoxy)phenoxy)propionate (US-A

4,808,750),
methyl 2-(4-(2-chloro-4-trifluoromethylphenoxy)phenoxy)propionate (DE-A 24 33 067),
methyl 2-(4-(2-fluoro-4-trifluoromethylphenoxy)phenoxy)propionate (US-A 4,808,750),
methyl 2-(4-(2,4-dichlorobenzyl)phenoxy)propionate (DE-A 24 17 487),
ethyl 4-(4-(4-trifluoromethylphenoxy)phenoxy)pent-2-enoate,
methyl 2-(4-(4-trifluoromethylphenoxy)phenoxy)propionate (DE-A 24 33 067);

A2) "monocyclic" heteroaryloxyphenoxyalkanecarboxylic acid derivatives, for example
ethyl 2-(4-(3,5-dichloropyridyl-2-oxy)phenoxy)propionate (EP-A 0 002 925),
propargyl 2-(4-(3,5-dichloropyridyl-2-oxy)phenoxy)propionate (EP-A 0 003 114),
methyl 2-(4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (EP-A 0 003 890),
ethyl 2-(4-(3-chloro-5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (EP-A 0 003 890),
propargyl 2-(4-(5-chloro-3-fluoro-2-pyridyloxy)phenoxy)propionate (EP-A 0 191 736),
butyl 2-(4-(5-trifluoromethyl-2-pyridyloxy)phenoxy)propionate (fluazifop-butyl);

A3) "bicyclic" heteroaryloxyphenoxyalkanecarboxylic acid derivatives, for example
methyl and ethyl 2-(4-(6-chloro-2-quinoxalyloxy)phenoxy)propionate (quizalofopmethyl and quizalofopethyl),
methyl 2-(4-(6-fluoro-2-quinoxalyloxy)phenoxy)propionate (see J. Pest. Sci. Vol. 10, 61 (1985)),
2-isopropylideneaminooxyethyl 2-(4-(6-chloro-2-quinoxalyloxy)phenoxy)propionate (propaquizafop),

ethyl 2-(4-(6-chlorobenzoxazol-2-yloxy)phenoxy)propionate (fenoxaprop-ethyl), its D(+) isomer (fenoxaprop-P-ethyl EX) and ethyl 2-(4-(6-chlorobenzothiazol-2-yloxy)-phenoxy)propionate (DE-A 26 40 730),
tetrahydro-2-furylmethyl 2-(4-(6-chloroquinoxalyloxy)phenoxy)propionate (EP-A 0 323 727);

B) chloroacetanilides, for example
N-methoxymethyl-2,6-diethyl-chloroacetanilide (alachlor),
N-(3-methoxyprop-2-yl)-2-methyl-6-ethylchloroacetanilide (metolachlor),
2,6-dimethyl-N-(3-methyl-1,2,4-oxadiazol-5-ylmethyl)chloroacetanilide,
N-(2,6-dimethylphenyl)-N-(1-pyrazolylmethyl)chloroacetamide (metazachlor);

C) thiocarbamates, for example
S-ethyl N,N-dipropylthiocarbamate (EPTC),
S-ethyl N,N-diisobutylthiocarbamate (butylate);

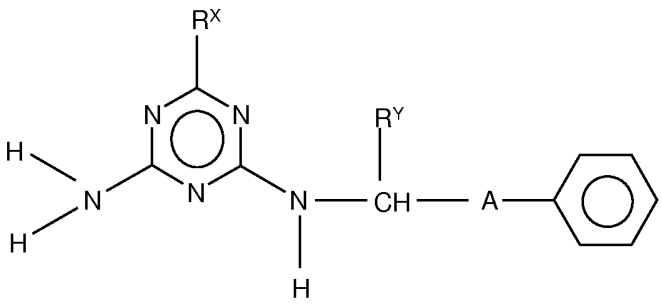
D) cyclohexanedione oximes, for example
methyl 3-(1-allyloxyiminobutyl)-4-hydroxy-6,6-dimethyl-2-oxocyclohex-3-enecarboxylate (alloxydim),
2-(1-ethoxyiminobutyl)-5-(2-ethylthiopropyl)-3-hydroxycyclohex-2-ene-1-one (sethoxydim),
2-(1-ethoxyiminobutyl)-5-(2-phenylthiopropyl)-3-hydroxycyclohex-2-ene-1-one (cloproxydim),
2-(1-(3-chloroallyloxy)iminobutyl)-5-(2-ethylthiopropyl)-3-hydroxycyclohex-2-ene-1-one,
2-(1-(3-chloroallyloxy)iminopropyl)-5-(2-ethylthiopropyl)-3-hydroxycyclohex-2-ene-1-one (clethodim),
2-(1-ethoxyiminobutyl)-3-hydroxy-5-(thian-3-yl)cyclohex-2-enone (cycloxydim),
2-(1-ethoxyiminopropyl)-5-(2,4,6-trimethylphenyl)-3-hydroxycyclohex-2-ene-1-one (tralkoxydim);

E) benzoylcyclohexanediones, for example
2-(2-chloro-4-methylsulfonylbenzoyl)cyclohexane-1,3-dione (SC-

0051, EP-A 0 137 963), 2-(2-nitrobenzoyl)-4,4-dimethylcyclohexane-1,3-dione (EP-A 0 274 634), 2-(2-nitro-4-methylsulfonylbenzoyl)-4,4-dimethylcyclohexane-1,3-dione (WO 91/13548 mesotrione);

F) S-(N-aryl-N-alkylcarbamoylmethyl) dithiophosphonates, such as S-[N-(4-chlorophenyl)-N-isopropylcarbamoylmethyl] O,O-dimethyl dithiophosphate (anilophos);

G) alkylazines, such as, for example, described in WO-A 97/08156, WO-A-97/31904, DE-A-19826670, WO-A-98/15536, WO-A-8/15537, WO-A-98/15538, WO-A-98/15539 and also DE-A-19828519, WO-A-98/34925, WO-A-98/42684, WO-A-99/18100, WO-A-99/19309, WO-A-99/37627 and WO-A-99/65882, preferably those of the formula (G)



(G)

in which

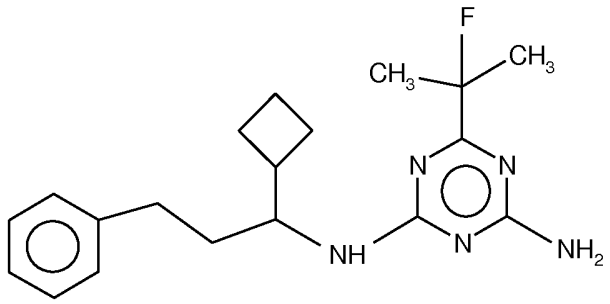
R^X is (C_1-C_4)-alkyl or (C_1-C_4)-haloalkyl;

R^Y is (C_1-C_4)-alkyl, (C_3-C_6)-cycloalkyl or (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl and

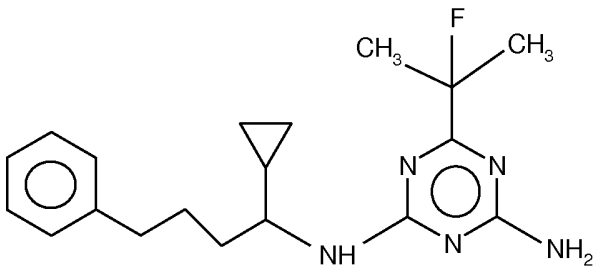
A is $-CH_2-$, $-CH_2-CH_2-$, $-CH_2-CH_2-CH_2-$, $-O-$, $-CH_2-CH_2-O-$, $-CH_2-CH_2-CH_2-O-$,

particularly preferably those of the formulae G1-G7

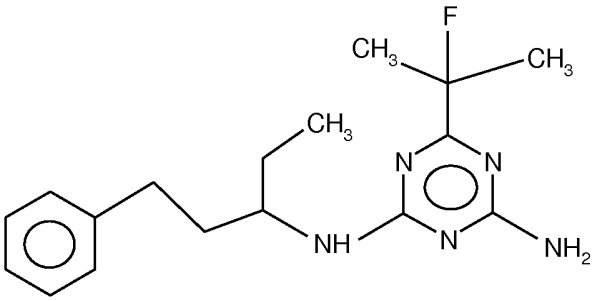
(G1)



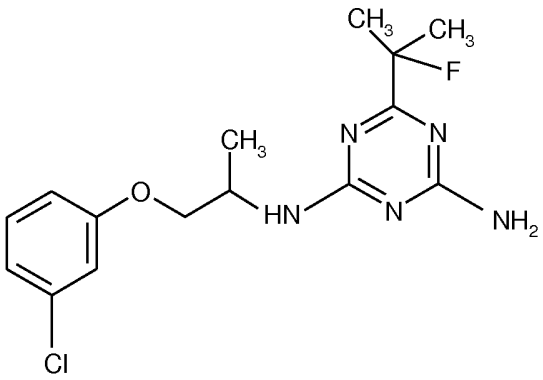
(G2)


F
CH3
CH3
N
N
N
NH
NH2

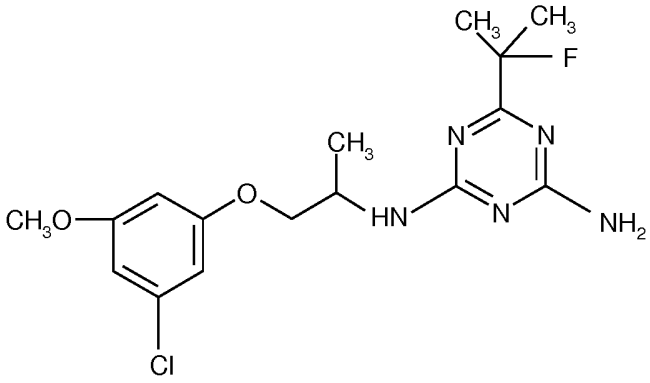
(G3)


F
CH3
CH3
CH3
N
N
N
NH
NH2

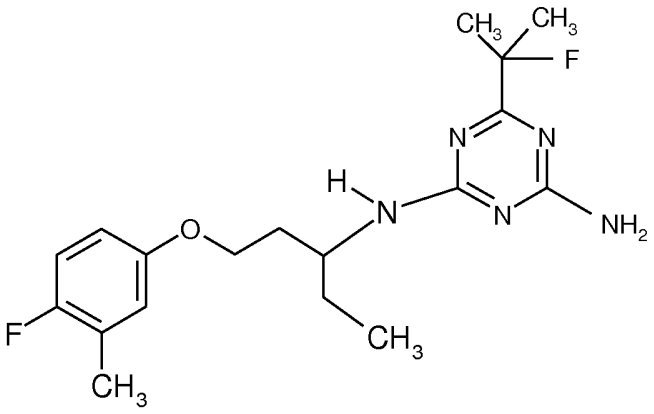
(G4)


CH3
CH3
F
CH3
N
N
O
HN
N
NH2
Cl

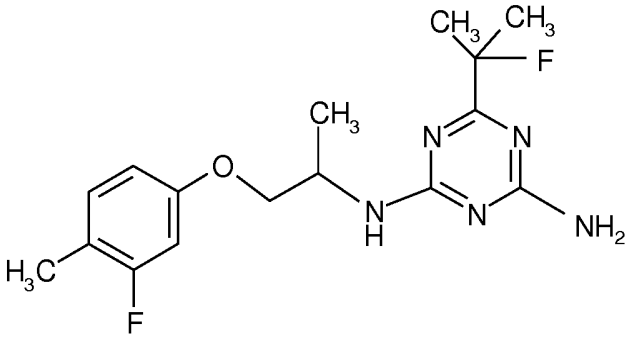
(G5)


CH3
CH3
F
CH3
N
N
CH3O
O
HN
N
NH2
Cl

(G6)



(G7)



H) Phosphorus-containing herbicides, for example of the glusosinate type, such as glufosinate in a narrower sense, i.e. D,L-2-amino-4-[hydroxy(methyl)phosphinyl]butanoic acid, glufosinate monoammonium salt, L-glufosinate, L- or (2S)-2-amino-4-[hydroxy(methyl)phosphinyl]butanoic acid L-glufosinate monoammonium salt or bialaphos (or bilanafos), i.e. L-2-amino-4-[hydroxy(methyl)phosphinyl]butanoyl-L-alanyl-L-alanine, in particular its sodium salt,
or of the glyphosate type, such as glyphosate, i.e. N-(phosphonomethyl)glycine, glyphosate monoisopropylammonium salt, glyphosate sodium salt or sulfosate, i.e. N-(phosphonomethyl)glycine trimesium salt = N-(phosphonomethyl)glycine trimethylsulfoxonium salt.

The herbicides of groups A to H are known, for example, from the abovementioned publications and from "The Pesticide Manual", 12th edition, 2000, The British Crop Protection Council, "Agricultural Chemicals Book II - Herbicides -", by W.T. Thompson, Thompson Publications, Fresno CA, USA 1990 and "Farm Chemicals Handbook '90", Meister Publishing Company,

Willoughby OH, USA, 1990.

Suitable agrochemically active compounds (e) (which are different from components (a) and (b) and may or may not be present) for the oil suspension concentrates according to the invention are, for example, the known active compounds listed below, as described, for example, in Weed Research 26, 441-445 (1986), or in "The Pesticide Manual", 12th edition, The British Crop Protection Council, 2000, and the literature cited therein, for example in formulated mixtures or as components for tank mixes. The compounds are referred to either by the "common name" according to the International Organization for Standardization (ISO) or by the chemical name, if appropriate together with a customary code number, and include in each case all use forms, such as acids, salts, esters and isomers, such as stereoisomers and optical isomers: acetochlor; acifluorfen; aclonifen; AKH 7088, i.e. [[[1-[5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy]acetic acid and methyl [[[1-[5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrophenyl]-2-methoxyethylidene]amino]oxy]acetate; alachlor; alloxydim; ametryn; amitrol; AMS, i.e. ammonium sulfamate; anilofos; asulam; atrazine; azafenidine (DPX-R6447); aziprotryn; barban; BAS 516 H, i.e. 5-fluoro-2-phenyl-4H-3,1-benzoxazin-4-one; benazolin; benfluralin; benfuresate; bensulide; bentazone; benzofluor; benzoylprop-ethyl; benzthiazuron; bialaphos; bifenox; bispyribac-sodium (KIH-2023), bromacil; bromobutide; bromofenoxim; bromoxynil, in particular bromoxynil-octanoate and bromoxynil-heptanoate; butachlor; butamifos; butenachlor; buthidazole; butralin; butroxydim (ICI-0500), butylate; cafenstrole (CH-900); carbetamide; cafentrazone; CDAA, i.e. 2-chloro-N,N-di-2-propenylacetamide; CDEC, i.e. 2-chloroallyl diethyldithiocarbamate; chlomethoxyfen; chloramben; cloransulam-methyl (XDE-565), chlorazifop-butyl, chlorbromuron; chlorbufam; chlorfenac; chlorflurenol-methyl; chloridazon; chlornitrofen; chlorotoluron; chloroxuron; chlorpropham; chlorthal-dimethyl; chlorthiamid; cinidon-ethyl, cinmethylin; clethodim; clodinafop and its ester derivatives

(for example clodinafop-propargyl); clomazone; clomeprop; cloproxydim; clopyralid; cumyluron (JC 940); cyanazine; cycloate; cycloxydim; cycluron; cyhalofop and its ester derivatives (for example the butyl ester, DEH-112); cyperquat; cyprazine; cyprazole; 2,4-D; 2,4-DB; dalapon; desmedipham; desmetryn; di-allate; dicamba; dichlobenil; dichlorprop; diclofop and its esters, such as diclofop-methyl; diclosulam (XDE-564), diethatyl; difenoxuron; difenzoquat; diflufenican; diflufenzopyr-sodium (SAN-835H), dimefuron; dimethachlor; dimethametryn; dimethenamid (SAN-582H); dimidazone, methyl 5-(4,6-dimethylpyrimidin-2-ylcarbamoylsulfamoyl)-1-(2-pyridyl)pyrazole-4-carboxylate (NC-330); triaziflam (IDH-1105), cinosulfon; dimethipin, dinitramine; dinoseb; dinoterb; diphenamid; dipropetryn; diquat; dithiopyr; diuron; DNOC; eglinazine-ethyl; EL 177, i.e. 5-cyano-1-(1,1-dimethylethyl)-N-methyl-1H-pyrazole-4-carboxamide; endothal; indanofan (MK-243), EPTC; esprocarb; ethalfluralin; ethidimuron; ethiozin; ethofumesate; F5231, i.e. N-[2-chloro-4-fluoro-5-[4-(3-fluoropropyl)-4,5-dihydro-5-oxo-1H-tetrazol-1-yl]phenyl]ethanesulfonamide; ethoxyfen and its esters (for example the ethyl ester, HN-252); etobenzanid (HW 52); 3-(4-ethoxy-6-ethyl-1,3,5-triazin-2-yl)-1-(2,3-dihydro-1,1-dioxo-2-methylbenzo[b]thiophene-7-sulfonyl)urea (EP-A 079 683); 3-(4-ethyl-6-methoxy-1,3,5-triazin-2-yl)-1-(2,3-dihydro-1,1-dioxo-2-methylbenzo[b]thiophene-7-sulfonyl)urea (EP-A 079 683); fenoprop; clomazone, fenoxaprop and fenoxaprop-P and their esters, for example fenoxaprop-P-ethyl and fenoxaprop-ethyl; butroxydimfenuron; flamprop-methyl; flufenacet (BAY-FOE-5043), fluazifop and fluazifop-P and their esters, for example fluazifop-butyl and fluazifop-P-butyl, florasulam (DE-570); fluchloralin; flumetsulam; fluometuron; flumiclorac and its esters (for example the pentyl ester, S-23031); flumioxazin (S-482); flumipropyn; flupoxam (KNW-739); fluorodifen; fluoroglycofen-ethyl; flupropacil (UBIC-4243); fluridone; flurochloridone; fluroxypyr; flurtamone; fluthiacet-methyl (KIH-9201), fomesafen; fosamine; furyloxyfen; glufosinate; glyphosate; halosafen; halosulfuron and its esters (for example the methyl ester, NC-319);

haloxyfop and its esters; haloxyfop-P (= R-haloxyfop) and its esters; hexazinone; imazamethabenz-methyl; imazamox (AC-299263), imazapyr; imazaquin and salts thereof, such as the ammonium salt; imazapic; imazethapyr; imazosulfuron; ioxynil; isocarbamid; isopropalin; isoproturon; isouron; isoxaben; isoxapyrifop; karbutilate; lactofen; lenacil; linuron; MCPA; MCPB; mecoprop; mefenacet; mefluidid; metamitron; metazachlor; methabenzthiazuron; metam; methazole; methoxyphenone; methyldymron; metobenzuron, mesosulfuron-methyl, mesosulfuron-methyl (WO 95/10507); metobromuron; metolachlor; S-metolachlor, metosulam (XRD 511); metoxuron; metribuzin; maleic hydrazide; molinate; monalide; monocarbamide dihydrogensulfate; monolinuron; monuron; MT 128, i.e. 6-chloro-N-(3-chloro-2-propenyl)-5-methyl-N-phenyl-3-pyridazinamine; MT 5950, i.e. N-[3-chloro-4-(1-methylethyl)phenyl]-2-methylpentanamide; foramsulfuron (WO 95/01344); naproanilide; napropamide; naptalam; NC 310, i.e. 4-(2,4-dichlorobenzoyl)-1-methyl-5-benzyloxypyrazole; neburon; nipyraclophen; nitralin; nitrofen; nitrofluorfen; norflurazon; orbencarb; oryzalin; oxadiargyl (RP-020630); oxadiazon; oxaziclomefone (MY-100), oxyfluorfen; paraquat; pebulate; pendimethalin; pentoxazone (KPP-314), perfluidone; phenisopham; phenmedipham; picloram; piperophos; pyributicarb; pirifenop-butyl; pretilachlor; procyazine; prodiamine; profluralin; proglinazine-ethyl; prometon; prometryn; propachlor; propanil; propaquizafop and its esters; propazine; propham; propisochlor; propyzamide; prosulfalin; prosulfocarb; prynachlor; pyraflufen-ethyl (ET-751), chloridazon; pyrazoxyfen; pyribenzoxim, pyridate; pyriminobac-methyl (KIH-6127), pyrithiobac (KIH-2031); pyroxofop and its esters (for example the propargyl ester); quinclorac; quinmerac; quizalofop, quizalofop and quizalofop-P and their ester derivatives, for example quizalofop-ethyl; quizalofop-P-tefuryl and -ethyl; S 275, i.e. 2-[4-chloro-2-fluoro-5-(2-propynyloxy)phenyl]-4,5,6,7-tetrahydro-2H-indazole; secbumeton; sethoxydim; siduron; simazine; simetryn; SN 106279, i.e. 2-[[7-[2-chloro-4-(trifluoromethyl)phenoxy]-2-naphthalenyl]oxy]propanoic acid and methyl 2-[[7-[2-chloro-

4-(trifluoromethyl)phenoxy]-2-naphthalenyl]oxy]propanoate; flazasulfuron (FMC-97285, F-6285); sulfazuron; glyphosate-trimesium (ICI-A0224); TCA; tebutam (GCP-5544); tebuthiuron; tepraloxydim (BAS-620H), terbacil; terbucarb; terbuchlor; terbumeton; terbuthylazine; terbutryn; TFH 450, i.e. N,N-diethyl-3-[(2-ethyl-6-methylphenyl)sulfonyl]-1H-1,2,4-triazole-1-carboxamide; thenylchlor (NSK-850); thiazafluron; thiazopyr (Mon-13200); thidiazimin (SN-124085); thiobencarb; tiocarbazil; tralkoxydim; tri-allate; triazofenamide; triclopyr; tridiphane; trietazine; trifluralin; trimeturon; tsitodef; vernolate; WL 110547, i.e. 5-phenoxy-1-[3-(trifluoromethyl)phenyl]-1H-tetrazole; UBH-509; D-489; LS 82-556; KPP-300; KPP-421, MT-146, NC-324; butenachlor (KH-218); DPX-N8189; haloxyfop-etotyl (DOWCO-535); DK-8910; flumioxazin (V-53482); PP-600; MBH-001, amicarbazone, aminopyralid, beflubutamid, benzobicyclon, benzofenap, benzfendizone, butafenacil, chlorfenprop, cloprop, daimuron, dichlorprop-P, dimepipeate, dimethenamid-P, fentrazamide, flamprop-M, fluazolate, indanofan, isoxachlortole, isoxaflutole, MCPA-thioethyl, mecoprop-P, mesotrione, metamifop, penoxsulam, pethoxamid, picolinafen, profluazol, profoxydim, pyraclonil, pyrazolynate, pyridafol, pyriftalid, sulcotrione, thidiazuron.

Preferred components e) are bromoxynil (E1) in all its use forms including the salts and esters, for example bromoxynil-octanoate (E1.1), bromoxynil-heptanoate (E1.2), bromoxynil-butyrate (E1.3), bromoxynil-sodium (E1.4) and bromoxynil-potassium (E1.5); 2,4-D (E2) in all its use forms including the salts and esters, for example 2,4-D-butotyl (E2.1), 2,4-D-butyl (E2.2), 2,4-D-dimethylammonium (E2.3), 2,4-D-diethanolamine (E2.4), 2,4-D-2-ethylhexyl (E2.5), 2,4-D-isooctyl (E2.6), 2,4-D-isopropyl (E2.7), 2,4-D-sodium (E2.8) and 2,4-D-triethanolamine (E2.9); dicamba (E3) in all its use forms including the salts and esters, for example dicamba-sodium (E3.1), dicamba-potassium (E3.2) and dicamba-dimethylammonium (E3.3); fenoxaprop (E4) in all its use forms including the esters, for example fenoxaprop-ethyl (E4.1) and

fenoxaprop-P-ethyl (E4.2); fluroxypyr (E5) in all its use forms including the salts and esters, for example fluroxypyr-meptyl (E5.1) and fluroxypyr-2-butoxy-1-methylethyl (E5.2); MCPA (E6) in all its use forms including the salts and esters, for example MCPA-sodium (E6.1), MCPA-potassium (E6.2), MCPA-2-ethylhexyl (E6.3), MCPA-butotyl (E6.4) and MCPA-dimethylammonium (E6.5).

If the oil suspension concentrates according to the invention contain agrochemically active compounds e), their proportion by weight is from 0.5 to 50% by weight, in particular from 3 to 20% by weight.

The total amount of active compounds (the sum of components a) + b) + e)) in the oil suspension concentrates according to the invention is generally between 1 and 80% by weight, in particular between 3 and 60% by weight.

Suitable organic solvents (component c) are, for example:
1) hydrocarbons, which may be unsubstituted or substituted, for example

1a) aromatic hydrocarbons, for example
· mono- or polyalkylsubstituted benzenes, such as toluene, xylenes, mesitylene, ethylbenzene, or
· mono- or polyalkylsubstituted naphthalenes, such as 1-methylnaphthalene, 2-methylnaphthalene or dimethylnaphthalene, or
· other hydrocarbons derived from benzene, such as indane or Tetralin®, or
· mixtures thereof,

1b) aliphatic hydrocarbons, for example
· straight-chain or branched aliphatic compounds, for example of the formula C_nH_{2n+2}, such as pentane, hexane, octane, 2-methylbutane or 2,2,4-trimethylpentane, or
· cyclic, optionally alkyl-substituted aliphatic compounds, such as cyclohexane or methylcyclopentane, or

· mixtures thereof, such as solvents of the Exxsol® D series, Isopar® series or Bayol® series, for example Bayol® 82 (ExxonMobil Chemicals) or of the Isane® IP series or Hydroseal® G series (TotalFinaElf),

1c) mixtures of aromatic and aliphatic hydrocarbons, such as solvents of the Solvesso® series, for example Solvesso® 100, Solvesso® 150 or Solvesso® 200 (ExxonMobil Chemicals), of the Solvarex®/Solvaro® series (TotalFinaElf) or of the Caromax® series, for example Caromax® 28 (Petrochem Carless), or

1d) halogenated hydrocarbons, such as halogenated aromatic and aliphatic hydrocarbons, such as chlorobenzene or methylene chloride, or

2) aprotic polar solvents, such as ethers, esters of mono-, di- or polyhydric C_1-C_9-alkanoic acids, such as their mono-, di- or triesters, for example with C_1-C_{18}-alkyl alcohols, ketones with a small tendency to tautomerize, phosphoric acid esters, amides, nitriles or sulfones, for example diisobutyl adipate, Rhodiasolv® RPDE (Rhodia), cyclohexanone, Jeffsol® PC (Huntsman), γ-butyrolactone, N-methylpyrrolidone, dimethyl sulfoxide, acetonitrile, tributylphosphatam or the Hostarex® PO series (Clariant), or

3) fatty acid esters, for example of natural origin, for example natural oils, such as animal oils or vegetable oils, or of synthetic origin, for example the Edenor® series, for example Edenor® MEPa or Edenor® MESU, or the Agnique® ME series or Agnique® AE series (Cognis), the Salim® ME series (Salim), the Radia® series, for example Radia® 30167 (ICI), the Prilube® series, for example Prilube® 1530 (Petrofina), the Stepan® C series (Stepan) or the Witconol® 23 series (Witco). The fatty acid esters are preferably esters of C_{10}-C_{22}-, with preference C_{12}-C_{20}-, fatty acids. The C_{10}-C_{22}-fatty acid esters are, for example, esters of unsaturated or saturated C_{10}-C_{22}-fatty acids, in particular those having an even number of carbons, for example erucic acid, lauric acid, palmitic acid, and in particular C_{18}-fatty acids, such as stearic acid, oleic acid,

linoleic acid or linolenic acid.

Examples of fatty acid esters such as C_{10}-C_{22}-fatty acid esters are glycerol and glycol esters of fatty acids such as C_{10}-C_{22}-fatty acids, or transesterification products thereof, for example fatty acid alkyl esters such as C_{10}-C_{22}-fatty acid C_1-C_{20}-alkyl esters, which can be obtained, for example, by transesterification of the abovementioned glycerol or glycol fatty acid esters such as C_{10}-C_{22}-fatty acid esters with C_1-C_{20}-alcohols (for example methanol, ethanol, propanol or butanol). The transesterification can be carried out by known methods, as described, for example, in Römpp Chemie Lexikon, 9th edition, volume 2, page 1343, Thieme Verlag Stuttgart.

Preferred fatty acid alkyl esters such as C_{10}-C_{22}-fatty acid C_1-C_{20}-alkyl esters are methyl esters, ethyl esters, propyl esters, butyl esters, 2-ethylhexyl esters and dodecyl esters. Preferred glycol and glycerol fatty esters such as C_{10}-C_{22}-fatty acid esters are the uniform or mixed glycol esters and glycerol esters of C_{10}-C_{22}-fatty acids, in particular of such fatty acids having an even number of carbon atoms, for example erucic acid, lauric acid, palmitic acid and in particular C_{18}-fatty acids such as stearic acid, oleic acid, linoleic acid or linolenic acid.

Animal oils c) are generally known and commercially available. For the purpose of the present invention, the term “animal oils” is to be understood as meaning, for example, oils of animal origin such as whale oil, cod-liver oil, musk oil or mink oil.

Vegetable oils c) are generally known and commercially available. For the purpose of the present invention, the term “vegetable oils” is to be understood as meaning, for example, oils of oleaginous plant species, such as soybean oil, rapeseed oil, corn oil, sunflower oil, cottonseed oil, linseed oil, coconut oil, palm oil, thistle oil, walnut oil, arachis oil, olive oil or castor oil, in particular rapeseed oil,

where the vegetable oils also include their transesterification products, for example alkyl esters, such as rapeseed oil methyl ester or rapeseed oil ethyl ester.

The vegetable oils are preferably esters of C_{10}-C_{22}-, preferably C_{12}-C_{20}-, fatty acids. The C_{10}-C_{22}-fatty acid esters are, for example, esters of unsaturated or saturated C_{10}-C_{22}-fatty acids having, in particular, an even number of carbon atoms, for example erucic acid, lauric acid, palmitic acid and in particular,C_{18}-fatty acids such as stearic acid, oleic acid, linoleic acid or linolenic acid.

Examples of vegetable oils are C_{10}-C_{22}-fatty acid esters of glycerol or glycol with C_{10}-C_{22}-fatty acids, or C_{10}-C_{22}-fatty acid C_1-C_{20}-alkyl esters which can be obtained, for example, by transesterification of the glycerol or glycol C_{10}-C_{22}-fatty acid esters mentioned above with C_1-C_{20}-alcohols (for example methanol, ethanol, propanol or butanol). The transesterification can be carried out by known methods as described, for example, in Römpp Chemie Lexikon, 9th edition, volume 2, page 1343, Thieme Verlag Stuttgart.

The vegetable oils can be contained in the adjuvants according to the invention for example in the form of commercially available vegetable oils, in particular rapeseed oils, such as rapeseed oil methyl ester, for example Phytorob® B (Novance, France), Edenor® MESU and the Agnique® ME series (Cognis, Germany), the Radia® series (ICI), the Prilube® series (Petrofina), or biodiesel or in the form of commercially available, plant-oil-containing formulation additives, in particular those based on rapeseed oils, such as rapeseed oil methyl esters, for example Hasten® (Victorian Chemical Company, Australia, hereinbelow referred to as Hasten, main ingredient: rapeseed oil ethyl ester), Actirob® B (Novance, France, hereinbelow referred to as ActirobB, main ingredient: rapeseed oil methyl ester), Rako-Binol® (Bayer AG, Germany, hereinbelow referred to as Rako-Binol, main ingredient: rapeseed oil), Renol® (Stefes, Germany, hereinbelow referred to as Renol,

vegetable oil ingredient: rapeseed oil methyl ester) or Stefes Mero® (Stefes, Germany, hereinbelow referred to as Mero, main ingredient: rapeseed oil methyl ester).

Examples of synthetic fatty acid esters are, for example, those derived from fatty acids having an odd number of carbon atoms, such as C_{11}-C_{21}-fatty acid esters.

Preferred organic solvents are aromatic hydrocarbons, aliphatic hydrocarbons and fatty acid esters, such as vegetable oils, such as triglycerides of fatty acids having 10 to 22 carbon atoms, which may be saturated or else unsaturated, linear or branched and which may or may not carry further functional groups, such as corn oil, rapeseed oil, sunflower oil, cottonseed oil, linseed oil, soybean oil, coconut oil, palm oil, thistle oil or castor oil, and their transesterification products, such as fatty acid alkyl esters, and mixtures thereof.

The solvents can be present on their own or in a mixture. The solvent or solvent mixture used preferably has a low solubilizing effect on the phenylsulfonamide(s) used (component a).

The total proportion of solvent in the oil suspension concentrates according to the invention is generally between 5 and 95% by weight, preferably in the range between 20 and 80% by weight. The proportion of polar solvents, such as aprotic polar solvents, is generally below 20% by weight, preferably in the range from 0 to 10% by weight.

The sulfosuccinates (component d) contained in the oil suspension concentrates according to the invention can, for example, be mono- or diesters of sulfosuccinic acid, preferably those of the formula (III)

$$R^1-(X_1)_n-O-CO-CH_2-CH(SO_3M)-CO-O-(X_2)_m-R^2 \quad (III)$$

in which

R^1 is H or an unsubstituted or substituted C_1-C_{30}-hydrocarbon radical, such as C_1-C_{30}-alkyl or C_7-C_{30}-alkylaryl,

R^2 is H or an unsubstituted or substituted C_1-C_{30}-hydrocarbon radical, such as C_1-C_{30}-alkyl or C_7-C_{30}-alkylaryl, or a cation, for example a metal cation, such as an alkali metal or alkaline earth metal cation, or an ammonium cation, such as NH_4 or an alkyl-, alkylaryl- or poly(arylalkyl)phenylammonium cation,

X^1, X^2 are identical or different and independently of one another are a spacer unit, such as a polyether unit or a polyester unit,

n, m are identical or different and independently of one another are zero or 1, preferably zero, and

M is a cation, for example a metal cation, such as an alkali metal or alkaline earth metal cation, or an ammonium cation, such as NH_4 or an alkyl-, alkylaryl- or poly(arylalkyl)phenylammonium cation.

Preference is given to sulfosuccinates of the formula (III) in which R^1 and R^2 are identical or different and independently of one another are linear, branched or cyclic, saturated or unsaturated C_1-C_{20}-, preferably C_4-C_{18}-, alkyl radicals, such as methyl, ethyl, butyl, hexyl, cyclohexyl, octyl, such as 2-ethylhexyl, decyl, tridecyl or octadecyl radicals, or R^1 and R^2 are C_7-C_{20}-alkylaryl radicals, such as nonylphenyl, 2,4,6-tri-*sec*-butylphenyl, 2,4,6-tris-(1-phenylethyl)phenyl, alkylbenzyl or a hydrocinnamic radical,

X_1 and X_2 are identical or different and independently of one another are polyether units, such as polyethylene glycols $-(C_2H_4O)_p-$ or polypropylene glycols $-(C_3H_6O)_p-$ where p = 1 to p = 20, in particular p = 1 to p = 12, or polyester units, such as polyhydroxybutyric acid $-(CH[CH_3]-CH_2-COO)_q-$ or polylactic acid $-(CH[CH_3]-COO)_q-$ where q = 1 to q = 15, in particular q = 1 to q = 8,

n, m are identical or different and independently of one another are zero or 1, preferably zero, and M is a cation, for example a metal cation, such as an alkali metal or alkaline

earth metal cation, or an ammonium cation which may be alkyl-substituted.

Examples of sulfosuccinates according to the invention are

a1) sulfosuccinate which is esterified once or twice with linear, cyclic or branched aliphatic, cycloaliphatic and/or aromatic alcohols, having, for example, 1 to 22 carbon atoms in the alkyl radical, preferably mono- or dialkali metal sulfosuccinate, in particular mono- or disodium sulfosuccinate, which is esterified once or twice with methanol, ethanol, (iso)propanol, (iso)butanol, (iso)pentanol, (iso)hexanol, cyclohexanol, (iso)heptanol, (iso)octanol (in particular: ethylhexanol), (iso)nonanol, (iso)decanol, (iso)undecanol, (iso)dodecanol or (iso)tridecanol,

a2) sulfosuccinate which is esterified once or twice with (poly)alkylene oxide adducts of alcohols, having, for example, 1 to 22 carbon atoms in the alkyl radical and 1 to 200, preferably 2 to 200, alkylene oxide units in the (poly)alkylene oxide moiety, preferably mono- or dialkali metal sulfosuccinate, in particular mono- or disodium sulfosuccinate, which is esterified once or twice with dodecyl/tetradecyl alcohol plus 2-5 mol of ethylene oxide or with i-tridecyl+3mol of ethylene oxide,

a3) the dialkali metal salt, preferably the disodium salt, of maleic anhydride which has been reacted with one equivalent of an amine or an amino-terminated (poly)alkylene oxide adduct of an alcohol, an amine, a fatty acid, an ester or an amide and then sulfonated, having, for example, 1 to 22 carbon atoms in the alkyl radical and 1 to 200, preferably 2 to 200, oxyalkylene units in the (poly)alkylene oxide moiety, preferably the disodium salt of maleic anhydride which has been reacted with one equivalent of coconut fatty amine and then sulfonated,

a4) the dialkali metal salt, preferably the disodium salt, of maleic anhydride which has been reacted with one equivalent of an amide or a (poly)alkylene oxide adduct of an amide and then sulfonated, having, for example, 1 to 22 carbon atoms in the alkyl radical and 1 to 200, preferably 2 to 200,

oxyalykylene units in the (poly)alkylene oxide moiety, preferably the disodium salt of maleic anhydride which has been reacted with one equivalent of oleylamide+2 mol of ethylene oxide and then sulfonated, and/or

a5) the tetraalkali metal salt, preferably the tetrasodium salt, of N-(1,2-dicarboxyethyl)-N-octadecylsulfosuccinamate.

Examples of sulfosuccinates of groups a1) to a5) which are commercially available and preferred within the context of the present invention are listed below:

a1) sodium dialkylsulfosuccinate, for example sodium di-(C_4-C_{18})-alkylsulfosuccinate, such as sodium diisooctylsulfosuccinate, preferably sodium di-(2-ethylhexyl)sulfosuccinate, commercially available, for example, in the form of the Aerosol® brands (Cytec), the Agrilan® or Lankropol® brands (Akzo Nobel), the Empimin® brands (Albright&Wilson), the Cropol® brands (Croda), the Lutensit® brands (BASF), the Triton® brands (Union Carbide), the Geropon® brands (Rhodia) or the Imbirol®, Madeol® or Polirol® brands (Cesalpinia),

a2) sodium alcohol polyethylene glycol ether sulfosuccinate, commercially available, for example, in the form of Geropon® ACR brands (Rhodia),

a3) disodium alcohol polyethylene glycol ether semisulfosuccinate, commercially available, for example, in the form of the Aerosol® brands (Cytec), the Marlinat® or Sermul® brands (Condea), the Empicol® brands (Albright&Wilson), the Secosol® brands (Stepan), the Geropon® brands (Rhodia), the Disponil® or Texapon® brands (Cognis) or the Rolpon® brands (Cesalpinia),

a4) disodium N-alkylsulfosuccinamate, commercially available, for example, in the form of the Aerosol® brands (Cytec), the Rewopol® or Rewoderm® brands (Rewo), the Empimin® brands (Albright&Wilson), the Geropon® brands (Rhodia) or the Polirol® brands (Cesalpinia),

a5) disodium fatty acid amide polyethylene glycol ether semisulfosuccinate, commercially available, for example, in

the form of the Elfanol® or Lankropol® brands (Akzo Nobel), the Rewoderm®, Rewocid® or Rewopol® brands (Rewo), the Emcol® brands (Witco), the Standapol® brands (Cognis) or the Rolpon® brands (Cesalpinia), and

a6) tetrasodium N-(1,2-dicarboxyethyl)-N-octadecylsulfosuccinamate, commercially available, for example, in the form of Aerosol 22® (Cytec).

Sulfosuccinates are commercially available, for example, as Aerosol® (Cytec), Agrilan® or Lankropol® (Akzo Nobel), Empimin® (Huntsman), Cropol® (Croda), Lutensit® (BASF), Triton® GR series (UnionCarbide), Imbirol®/Madeol®/Polirol® (Cesalpinia); as Geropon®AR series or as Geropon® SDS (Rhodia).

Preferred sulfosuccinates are, for example, the sodium, potassium and ammonium salts of bis(alkyl)sulfosuccinates, where the alkyl radicals are identical or different and contain 4 to 16 carbon atoms and are preferably butyl, hexyl, octyl, such as 2-ethylhexyl or decyl radicals, which may be straight-chain or branched.

The total proportion of sulfosuccinate(s) in the oil suspension concentrates according to the invention is generally between 0.1 and 60% by weight, in particular in the range between 0.5 and 30% by weight.

Customary auxiliaries and additives (component f) which may also be contained in the oil suspension concentrates according to the invention are, for example: surfactants, such as emulsifiers and dispersants, thickeners and thixotropic agents, wetting agents, anti-drift agents, adhesives, penetrants, preservatives and antifreeze agents, antioxidants, solubilizers, fillers, carriers and colorants, antifoams, fertilizers, evaporation inhibitors and agents which modify pH and viscosity.

Suitable emulsifiers and dispersants are surfactants from the group of the nonionic emulsifiers and dispersants selected

from the group of

1) polyalkoxylated, preferably polyethoxylated, saturated and unsaturated aliphatic alcohols,

· having 8 to 24 carbon atoms in the alkyl radical, which is derived from the corresponding fatty acids or from petrochemical products, and

· having 1 to 100, preferably 2 to 50, ethylene oxide units (EO), it being possible for the free hydroxyl group to be alkoxylated,

· which are commercially available, for example as Genapol® X and Genapol® O series (Clariant), Crovol® M series (Croda) or as Lutensol® series (BASF),

2) polyalkoxylated, preferably polyethoxylated, arylalkylphenols, such as, for example, 2,4,6-tris-(1-phenylethyl)phenol (tristyrylphenol) having an average degree of ethoxylation of between 10 and 80, preferably from 16 to 40, such as, for example Soprophor® BSU (Rhodia) or HOE S 3474 (Clariant),

3) polyalkoxylated, preferably polyethoxylated, alkylphenols having one or more alkyl radicals, such as, for example, nonylphenol or tri-*sec*-butylphenol, and a degree of ethoxylation of between 2 and 40, preferably from 4 to 15, such as, for example, Arkopal® N series or Sapogenat® T series (Clariant),

4) polyalkoxylated, preferably polyethoxylated, hydroxyfatty acids or glycerides which contain hydroxyfatty acids, such as, for example, ricinine or castor oil, having a degree of ethoxylation of between 10 and 80, preferably from 25 to 40, such as, for example, the Emulsogen® EL series (Clariant) or the Agnique® CSO series (Cognis),

5) polyalkoxylated, preferably polyethoxylated, sorbitan esters, such as, for example, Atplus® 309 F (Uniqema) or the Alkamuls® series (Rhodia),

6) di- and tri-block copolymers, for example from alkylene oxides, for example from ethylene oxide and propylene oxide, having average molar masses between 200 and 10 000, preferably from 1 000 to 4 000, g/mol, the proportion by mass of the polyethoxylated block varying between 10 and 80%, such as, for example, the Genapol® PF series (Clariant), the Pluronic® series (BASF), or the Synperonic® PE series (Uniqema).

Preferred nonionic emulsifiers and dispersants are, for example, polyethoxylated alcohols, polyethoxylated triglycerides which contain hydroxyfatty acids and polyethylene oxide/polypropylene oxide block copolymers.

The total proportion of nonionic emulsifiers and dispersants in the oil suspension concentrates according to the invention is generally between 0 and 20% by weight. If nonionic emulsifiers and dispersants are, in addition to their emulsifying/dispersing properties, also used for increasing the biological effectiveness, for example as penetrants or adhesives, their proportion in the oil suspension concentrates according to the invention can be increased to up to 60% by weight.

Also suitable are ionic emulsifiers and dispersants, for example:

1) polyalkoxylated, preferably polyethoxylated, emulsifiers/dispersants (cf. component e) which are ionically modified, for example by conversion of the terminal free hydroxyl function of the polyethylene oxide block into a sulfate or phosphate ester (for example as alkali metal and alkaline earth metal salts), such as, for example, Genapol® LRO or dispersant 3618 (Clariant), Emulphor® (BASF) or Crafol® AP (Cognis),

2) alkali metal and alkaline earth metal salts of alkylarylsulfonic acids having a straight-chain or branched alkyl chain, such as phenylsulfonate CA or phenylsulfonate CAL (Clariant), Atlox® 3377BM (ICI), or the Empiphos® TM series

(Huntsman),

3) polyelectrolytes, such as lignosulfonates, condensates of naphthalenesulfonate and formaldehyde, polystyrenesulfonate or sulfonated unsaturated or aromatic polymers (polystyrenes, polybutadienes or polyterpenes), such as the Tamol® series (BASF), Morwet® D425 (Witco), the Kraftsperse® series (Westvaco) or the Borresperse® series (Borregard).

Preferred ionic emulsifiers/dispersants are, for example, salts of alkylarylsulfonic acids and polyelectrolytes from the polycondensation of naphthalenesulfonate and formaldehyde.

The total proportion of ionic emulsifiers and dispersants in the oil suspension concentrates according to the invention is generally between 0 and 20% by weight, in particular between 0 and 8% by weight.

Suitable thickeners and thixotropic agents are, for example:

1) modified natural silicates, such as chemically modified bentonites, hectorites, attapulgites, montmorillonites, smectites or other silicate minerals, such as Bentone® (Elementis), Attagel® (Engelhard), Agsorb® (Oil-Dri Corporation) or Hectorite® (Akzo Nobel),

2) synthetic silicates, such as silicates of the Sipernat®, Aerosil® or Durosil® series (Degussa), the CAB-O-SIL® series (Cabot) or the Van Gel series (R.T. Vanderbilt),

3) thickeners based on synthetic polymers, such as thickeners of the Thixin® or Thixatrol® series (Elementis),

4) thickeners based on natural polymers and natural oils, for example from the Thixin® or Thixatrol® series (Elementis).

Preferred thickeners and thixotropic agents are, for example, modified phyllosilicates and thickeners based on synthetic polymers.

The proportion of thickeners and thixotropic agents in the oil suspension concentrates according to the invention is generally between 0 and 5% by weight, in particular between 0.2 and 3% by weight.

Preference is given to oil suspension concentrates according to the invention comprising:

a) from 0.1 to 30% by weight of one or more herbicidally active compounds from the group of the sulfonamides,

b) from 2 to 40% by weight of one or more safeners,

c) from 20 to 80% by weight of one or more solvents,

d) from 0.5 to 30% by weight of one or more sulfosuccinates,

e) from 3 to 20% by weight of one or more agrochemically active compounds different from a) and b),

f) from 0 to 20% by weight of one or more nonionic emulsifiers and dispersants,

from 0 to 8% by weight of one or more ionic emulsifiers and dispersants,

from 0 to 3% by weight of one or more thickeners and thixotropic agents.

In a preferred embodiment, the oil suspension concentrate according to the invention comprises

a) one or more herbicidally active compounds of the formula (I) or the formula (IV) and/or salts thereof, preferably A1.1 to A19.2,

b) a safener from the group consisting of S1-1, S1-9 and S2-1,

c) an organic solvent from the group of the aliphatic hydrocarbons, the mixtures of aromatic and aliphatic hydrocarbons and the vegetable oils, such as rapeseed oil methyl ester, and

d) an alkali metal di-(C_4-C_{18})-alkylsulfosuccinate, such as sodium di-(C_4-C_{18})-alkylsulfosuccinate.

Particularly preferred examples which may be mentioned are oil suspension concentrates according to the invention comprising

the components listed below, this not however limiting the invention, where Solvesso is a solvent from the Solvesso® series, preferably Solvesso® 200, Bayol is a solvent from the Bayol® series, preferably Bayol® 82, Edenor = Edenor® MESU and Actirob = Actirob® B.

In a preferred embodiment, component a) comprises a combination for example of various phenylsulfonylureas of the formula (II) and/or salts thereof, for example
mesosulfuron-methyl + iodosulfuron-methyl,
mesosulfuron-methyl + iodosulfuron-methyl-sodium,
mesosulfuron-methyl + foramsulfuron,
mesosulfuron-methyl + foramsulfuron-sodium,
mesosulfuron-methyl-sodium + iodosulfuron-methyl,
mesosulfuron-methyl-sodium + iodosulfuron-methyl-sodium,
mesosulfuron-methyl-sodium + foramsulfuron,
mesosulfuron-methyl-sodium + foramsulfuron-sodium,
foramsulfuron + iodosulfuron-methyl,
foramsulfuron + iodosulfuron-methyl-sodium,
foramsulfuron-sodium + iodosulfuron-methyl,
foramsulfuron-sodium + iodosulfuron-methyl-sodium.

The sulfonamides a) and their mixtures, for example the active compound mixtures of phenylsulfonylureas of the formula (II) and/or salts thereof mentioned above can be combined with one or more safeners, in particular with the safeners mefenpyr-diethyl (S1-1), fenchlorazole-ethyl (S1-6), isoxadifen-ethyl (S1-9), cloquintocet-mexyl (S2-1) and (S3-1).

All of the above combinations may also comprise one or more agrochemically active compounds (e), in particular those selected from the group consisting of (E1), (E1.1), (E1.2), (E1.3), (E1.4), (E1.5), (E2), (E2.1), (E2.2), (E2.3), (E2.4), (E2.5), (E2.6), (E2.7), (E2.8), (E2.9), (E3), (E3.1), (E3.2), (E3.3), (E4), (E4.1), (E4.2), (E5), (E5.1), (E5.2), (E6), (E6.1), (E6.2), (E6.3), (E6.4), (E6.5).

The phenylsulfonylaminocarbonyltriazolinones present as

component a), in particular those of the formula (I), such as flucarbazone or propoxycarbazone, and heteroarylsulfonylaminocarbonyltriazolinones, in particular those of the formula (IV), (VI) and (VII), are known, for example from WO 03/026427, for example the compounds (A20.1) , (A20.2), (A21.1), (A21.2), (A22.1), (A22.2), (A23.1), (A23.2), (A24.1), (A24.2), (A25.1), (A25.2), (A26.1), (A26.2), (A27.1), (A27.2), (A28.1), (A28.2), (A29.1), (A29.2), (A30.1), (A30.2), (A31.1), (A31.2), (A32.1), (A32.2), (A33.1), (A33.2), (A34.1), (A34.2), (A35.1), (A35.2), (A36.1), (A36.2), (A37.1), (A37.2), can also form oil suspension concentrates of high chemical and physical stability even without addition of sulfosuccinates. Such oil suspension concentrates are likewise provided by the present invention.

If the oil suspension concentrates according to the invention comprise, as component a), a mixture of a plurality of sulfonamides, for example the abovementioned mixtures of sulfonylureas of the formula (II) and/or salts thereof, at least one of sulfonamides is present in suspended form, but it is possible for all sulfonamides to be present in suspended form.

The oil suspension concentrates according to the invention can be prepared by known processes, for example by mixing the components. Thus, it is possible, for example, to prepare a premix by dissolving the sulfosuccinate d) in the organic solvent c) and, if appropriate, adding further auxiliaries and additives f) to this solution. Any soluble agrochemically active compounds b) and e) used are then dissolved in the premix. Once this dissolution process has ended, solid sulfonamide a) and, if appropriate, any insoluble active compounds b) and e) used are suspended in the mixture. The coarse suspension is, if appropriate after pregrinding, subjected to fine grinding.

In another embodiment, solid sulfonamide a) and, if appropriate, any insoluble components b), e) and f) used are

suspended in a mixture of organic solvent c) and sulfosuccinate d) and subjected to grinding. Any soluble active compounds b) and e) used and any auxiliaries and additives from f) which do not require grinding or are not required for the grinding process are added after grinding.

To prepare the mixtures, it is possible to use customary mixing apparatus which, if required, are thermostatted. For pregrinding, it is possible to use, for example, high-pressure homogenizers or mills operating by the rotor-stator principle, such as Ultraturrax homogenizers, for example those from IKA, or toothed colloid mills, for example from Puck. For fine grinding, it is possible to use, for example, bead mills which operate batch-wise, for example from Drais, or bead mills which operate continuously, for example from Bachofen. The preparation process can be adapted to the properties of the components employed and to technical and safety requirements and to economical considerations, and pregrinding and even fine grinding may be dispensed with, if required.

The components a) to f) used for the preparation may comprise water as a minor component which is then also found in the oil suspension concentrates according to the invention. Accordingly, the oil suspension concentrates according to the invention may comprise small amounts of water, in general from 0 to 5% by weight. Preferably, the oil suspension concentrates according to the invention are not subjected to any further drying.

For application, the oil suspension concentrates according to the invention may, if required, be diluted in a customary manner using, for example, water, to give, for example, suspensions, emulsions, suspoemulsions or solutions, preferably suspensions. It may be advantageous to add further agrochemically active compounds (for example tank mix components in the form of appropriate formulations) and/or auxiliaries and additives customary for application, for example self-emulsifying oils, such as vegetable oils or

paraffin oils, and/or fertilizers to the spray liquors obtained. Accordingly, the present invention also provides such herbicidal compositions based on the oil suspension concentrates according to the invention.

The herbicidal compositions according to the invention have outstanding herbicidal activity against a broad spectrum of economically important monocotyledonous and dicotyledonous harmful plants. Even perennial weeds which produce shoots from rhizomes, rootstocks or other perennial organs and which are difficult to control are controlled well. In this context, it does not matter whether the substances are applied before sowing, pre-emergence or post-emergence. Specific examples may be mentioned of some representatives of the monocotyledonous and dicotyledonous weed flora which can be controlled by the herbicidal compositions according to the invention, without the enumeration being a restriction to certain species.

Examples of weed species on which the herbicidal compositions act efficiently are, from amongst the monocotyledonous weed species, Apera spica venti, Avena spp., Alopecurus spp., Brachiaria spp., Digitaria spp., Lolium spp., Echinochloa spp., Panicum spp., Phalaris spp., Poa spp., Setaria spp. and Bromus spp. such as Bromus catharticus, Bromus secalinus, Bromus erectus, Bromus tectorum and Bromus japonicus, and Cyperus species from the annual group, and, among the perennial species, Agropyron, Cynodon, Imperata and Sorghum and also perennial Cyperus species.

In the case of the dicotyledonous weed species, the spectrum of action extends to genera such as, for example, Abutilon spp., Amaranthus spp., Chenopodium spp., Chrysanthemum spp., Galium spp. such as Galium aparine, Ipomoea spp., Kochia spp., Lamium spp., Matricaria spp., Pharbitis spp., Polygonum spp., Sida spp., Sinapis spp., Solanum spp., Stellaria spp., Veronica spp. and Viola spp., Xanthium spp., among the annuals, and Convolvulus, Cirsium, Rumex and Artemisia in the case of the perennial weeds.

The compositions according to the invention also act outstandingly efficiently on harmful plants which are found under the specific cultures in rice, such as, for example, Echinochloa, Sagittaria, Alisma, Eleocharis, Scirpus and Cyperus.

If the herbicidal compositions according to the invention are applied to the soil surface before germination, the weed seedlings are either prevented completely from emerging or else the weeds grow until they have reached the cotyledon stage, but then their growth stops, and, eventually, after three to four weeks have elapsed, they die completely.

If the herbicidal compositions according to the invention are applied post-emergence to the green parts of the plants, growth likewise stops drastically a very short time after the treatment, and the weed plants remain at the growth stage of the point of time of application, or they die completely after a certain time, so that in this manner competition by the weeds, which is harmful to the crop plants, is eliminated very early and in a sustained manner.

The herbicidal compositions according to the invention are distinguished by a rapidly commencing and long-lasting herbicidal action. As a rule, the rainfastness of the active substances in the combinations according to the invention is advantageous. A particular advantage is that the dosages used in the herbicidal compositions and the effective dosages of herbicidal compounds can be adjusted to such a low level that their soil action is optimally low. This does not only allow them to be employed in sensitive crops in the first place, but groundwater contaminations are virtually avoided. The active compound combination according to the invention allows the required application rate of the active substances to be reduced considerably.

The abovementioned properties and advantages are necessary for

weed control practice to keep agricultural crops free from undesired competing plants, and thus to ensure and/or increase yield levels from the qualitative and quantitative angle. These novel compositions markedly exceed the technical state of the art with a view to the properties described.

While the herbicidal compositions according to the invention have an outstanding herbicidal activity against monocotyledonous and dicotyledonous weeds, crop plants of economically important crops, for example dicotyledonous crops such as soya, cotton, oilseed rape, sugarbeet, or graminaceous crops such as wheat, barley, rye, oats, millet, rice or corn, are damaged only to a minor extent, if at all. This is why the present compounds are highly suitable for the selective control of undesired plant growth in plantations of agricultural crops or of ornamentals.

In addition, the herbicidal compositions according to the invention have outstanding growth-regulatory properties in crop plants. They engage in the plants' metabolism in a regulatory manner and can thus be employed for provoking direct effects on plant constituents and to facilitate harvesting such as, for example, by triggering desiccation and stunted growth. Moreover, they are also suitable for the general control and inhibition of undesired vegetative growth without simultaneously destroying the plants. Inhibition of vegetative growth is very important in a large number of monocotyledonous and dicotyledonous crops since lodging can thus be reduced, or prevented completely.

Owing to their herbicidal and plant-growth-regulatory properties, the herbicidal compositions according to the invention can also be employed for controlling harmful plants in crops of genetically modified plants which are known or yet to be developed. As a rule, the recombinant plants are distinguished by specific advantageous characteristics, for example by resistances to certain pesticides, in particular certain herbicides, resistances to plant diseases or the

causative organisms of plant diseases such as specific insects or microorganisms such as fungi, bacteria or viruses. Other specific characteristics relate, for example, to the harvested material with regard to quantity, quality, storability, composition and specific constituents. Thus, for example, transgenic plants are known whose starch content is increased, or whose starch quality is altered, or those where the harvested material has a different fatty acid composition.

The use of the compositions according to the invention in economically important transgenic crops of useful plants and ornamentals, for example of graminaceous crops such as wheat, barley, rye, oats, millet, rice and corn, or else crops of sugarbeet, cotton, soya, oilseed rape, potatoes, tomatoes, peas and other vegetables, is preferred. Preferably, the compositions according to the invention can be employed as herbicides in crops of useful plants which resist the phytotoxic effects of the herbicides, or have been made to resist these effects by recombinant techniques.

When using the herbicidal compositions according to the invention in transgenic crops, effects are frequently observed in addition to the effects against harmful plants to be observed in other crops, which are specific for the application in the transgenic crop in question, for example a modified or specifically widened weed spectrum which can be controlled, modified application rates which may be employed for application, preferably good combining ability with the herbicides to which the transgenic crop is resistant, and an effect on growth and yield level of the transgenic crop plants.

The present invention therefore furthermore also relates to a method for controlling undesired vegetation, preferably in crops of plants such as cereals (for example wheat, barley, rye, oats, rice, corn and millet), sugar beet, sugar cane, oilseed rape, cotton and soya, especially preferred in monocotyledonous plants such as cereals, for example wheat,

barley, rye, oats, and their hybrids such as triticale, rice, corn and millet, where one or more herbicidal compositions according to the invention are applied to the harmful plants, to plant parts, to plant seeds or to the area on which the plants grow, for example the area under cultivation.

The plant crops may also be genetically modified or have been obtained by mutation selection; they preferably tolerate acetolactate synthase (ALS) inhibitors.

The oil suspension concentrate of the present invention has excellent chemical stability during preparation and storage and is suitable in particular also for combinations of active compounds having different physicochemical properties, for example of a herbicidal phenylsulfonamide which is poorly soluble in organic solvents with a soluble safener and, if appropriate, further soluble agrochemically active compounds. Moreover, the oil suspension concentrate has excellent physical stability, is easy to apply and easy to use and has high biological effectiveness and selectivity.

Unless described otherwise, the oil suspension concentrates mentioned in the examples below were prepared as follows: A premix was prepared by dissolving sulfosuccinate d) in solvent c), and the further auxiliaries and additives f) were added to this solution. Safener b) was then dissolved in the premix. Following the dissolution process, solid sulfonamide a) was suspended in the mixture. The coarse suspension was, aftrer pregrinding, subjected to fine grinding.

The abbreviations used in the examples below have the following meanings:

iodosulfuron = 3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-1-(2-methoxycarbonyl-5-iodophenylsulfonyl)urea sodium salt
thifensulfuron = 3-(4-methoxy-6-methyl-1,3,5-triazin-2-yl-)-1-(2-methoxycarbonylthiophenesulfonyl)urea sodium salt

mefenpyr = ethyl 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylate
Bentone® 34 = modified phyllosilicate, Elementis
Edenor® MESU = rapeseed oil methyl ester, Cognis
Emulsogen® EL-400 = polyethoxylated castor oil having 40 ethylene oxide units, Clariant
Genapol® PF10 = polyethylene oxide/polypropylene oxide block copolymer having 10% ethylene oxide units, Clariant
Genapol® V4739 = polyethoxylated isotridecanol having 6 ethylene oxide units, methoxy-capped, Clariant
Jeffsol® PC = propylene carbonate, Huntsman
Solvesso® 200 = aromatic mineral oil (boiling point range 219-281°C), Exxon
Thixatrol® ST = thixothropic agent based on a castor oil derivative
Triton® GR-7M E = di(2-ethylhexyl)sulfosuccinate sodium salt in an aromatic solvent, Union Carbide
8W40°C = eight-week-storage trial at 40°C

Example 1:

Preparation of an oil suspension concentrate

The concentration of iodosulfuron before and after preparation of the oil suspension concentrate was determined by HPLC.

Table 1: Chemical stability of component a) during the preparation (all amounts in gram)

	Ex. 1.1	Ex. 1.2
iodosulfuron	5.00	5.00
mefenpyr	15.00	15.00
Triton ® GR-7M E	--	25.00
Edenor® MESU	62.64	37.38
Genapol® PF10	5.00	5.00
Emulsogen® EL-400	5.00	5.00
Thixatrol® ST	1.00	1.00
concentration of iodosulfuron		

	Ex. 1.1	Ex. 1.2
before the preparation	5.00	5.00
after the preparation	3.50	4.89

Example 2:

Preparation and storage of an oil suspension concentrate

The concentration of iodosulfuron before and after the preparation of the oil suspension concentrate and after 8 weeks of storage at 40°C was determined by HPLC.

Table 2: Chemical stability of component a) during preparation and storage (all amounts in % by weight)

	Ex. 2.1	Ex. 2.2	Ex. 2.3
iodosulfuron	5.00	10.00	12.00
mefenpyr	15.00	30.00	36.00
Solvesso® 200	42.00	28.00	20.00
Jeffsol® PC	1.00	0.50	--
Triton® GR-7M E	25.00	20.00	20.00
Genapol® V4739	5.00	5.00	5.00
Genapol® PF10	3.00	3.00	3.00
Emulsogen® EL-400	3.00	3.00	3.00
Bentone® 34	1.00	0.50	--
concentration of iodosulfuron			
before the preparation	5.00	10.00	12.0
after the preparation	4.97	9.92	11.5
after 8 W 40°C	4.73	9.73	11.5

Example 3:

Preparation of an oil suspension concentrate

The concentration of thifensulfuron before and after the preparation of the oil suspension concentrate was determined by HPLC.

	Ex. 3.1	Ex. 3.2
thifensulfuron	8.00	8.00
mefenpyr	24.00	24.00
Triton® GR-7M E	--	25.00
Edenor® MESU	50.64	25.38
Genapol® PF10	5.00	5.00
Emulsogen® EL-400	5.00	5.00
Thixatrol® ST	1.00	1.00

Example 3.2 according to the invention shows significantly higher chemical stability than comparative example 3.1.

Patentkrav

1. Oliesuspensionskoncentrat indeholdende
a) et eller flere herbicide aktivstoffer fra gruppen af sulfonamiderne i suspenderet form,
b) en eller flere safener,
c) et eller flere organiske opløsningsmidler,
d) et eller flere sulfosuccinater,
e) i givet fald et eller flere agrokemiske aktivstoffer, der er forskellige fra a) og b), og
f) som gængse hjælpe- og tilsætningsstoffer tensider fra gruppen af de ikke-ioniske emulgatorer og dispergatorer udvalgt af gruppen polyethoxylerede, mættede og umættede alifatiske alkoholer,
- med 8 til 24 C-atomer i alkylgruppen, som kan afledes af de tilsvarende fedtsyrer eller af petrokemiske produkter, og
- med 1 til 100, fortrinsvis 2 til 50, ethylenoxidenheder (EO), idet den frie hydroxygruppe i givet fald er alkoxyleret;
polyethoxylerede arylalkylphenoler, polyethoxylerede alkylphenoler med en eller flere alkylgrupper, glycerider indeholdende polyethoxylerede hydroxyfedtsyrer eller hydroxyfedtsyrer, polyethoxylerede sorbitanestere og di- og tri-blok-copolymerer; og i givet fald yderligere gængse hjælpe- og tilsætningsstoffer;
idet sulfonamiderne (bestanddel a)) foreligger ikke-opløst i fint fordelt form i det organiske opløsningsmiddel (bestanddel c)) med mere end 80 vægt-%.

2. Oliesuspensionskoncentrat ifølge krav 1, hvori der som bestanddel a) er indeholdt et eller flere herbicide aktivstoffer fra gruppen af phenylsulfonamiderne, fortrinsvis af phenylsulfonylaminocarbonyltriazolinonerne og phenylsulfonylcarbamider eller af heteroarylsulfonamiderne, fortrinsvis af heteroarylsulfonylaminocarbonyltriazolinonerne og heteroarylsulfonylcarbamider.

3. Oliesuspensionskoncentrat ifølge krav 1 eller 2, hvori der som bestanddel b) er indeholdt en eller flere safener fra

gruppen dichlorphenylpyrazolin-3-carboxylsyre og esterne heraf, 5,5-diphenyl-2-isoxazolin-3-carboxylsyre og esterne heraf og 8-quinolinoxyeddikesyre og esterne heraf.

4. Oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 3, hvori der som bestanddel c) er indeholdt et eller flere opløsningsmidler fra gruppen af usubstituerede eller substituerede carbonhydrider, aprotiske polare opløsningsmidler og fedstyreestere.

5. Oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 4, hvori der som bestanddel d) er indeholdt en eller flere sulfosuccinater fra gruppen af mono- og diesterne af sulforavsyre.

6. Oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 5 endvidere indeholdende e) et eller flere agrokemiske aktivstoffer, der er forskellige fra a) og b), og/eller f) yderligere gængse hjælpe- og tilsætningsstoffer.

7. Fremgangsmåde til fremstilling af et oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 6, hvori bestanddelene blandes med hinanden og i givet fald finmales.

8. Fremgangsmåde til bekæmpelse af skadelige planter, hvori en aktiv mængde af et oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 6 appliceres på de skadelige planter, dele af planterne, plantefrø, det areal, hvorpå planterne vokser.

9. Anvendelse af et oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 6 til bekæmpelse af skadelige planter.

10. Anvendelse af et oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 6 til fremstilling af et herbicidt middel.

11. Anvendelse ifølge krav 10, hvori det herbicide middel er en suspension, emulsion, suspoemulsion eller en opløsning.

12. Herbicidt middel indeholdende et oliesuspensionskoncentrat ifølge et eller flere af kravene 1 til 6.

13. Fremgangsmåde til bekæmpelse af skadelige planter, hvori en aktiv mængde af et herbicidt middel ifølge krav 12 appliceres på de skadelige planter, dele af planterne, plantefrø, det areal, hvorpå planterne vokser.

14. Anvendelse af et herbicidt middel ifølge krav 12 til bekæmpelse af skadelige planter.