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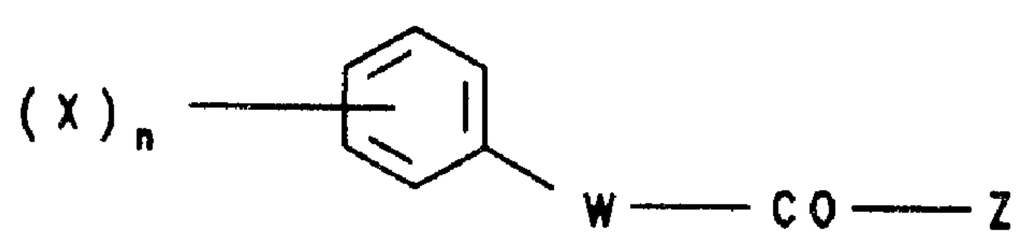

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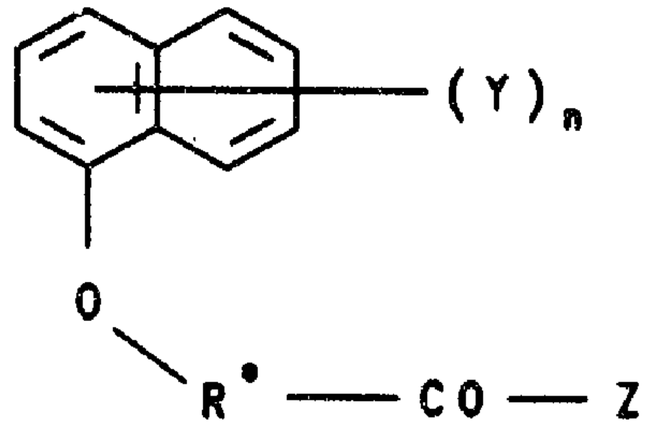


(B2)

(57) Abrégé/Abstract:
Combinations of herbicides and crop-protecting substances Herbicide/safener combinations of A) herbicides selected from the group of the 2-acylated 1,3-dicarbonyl compounds or salts thereof, and B) safeners B1 and/or B2 (see above formulae) as they are defined in claim 1, are suitable for controlling harmful plants in crops such as cereals, maize and rice.

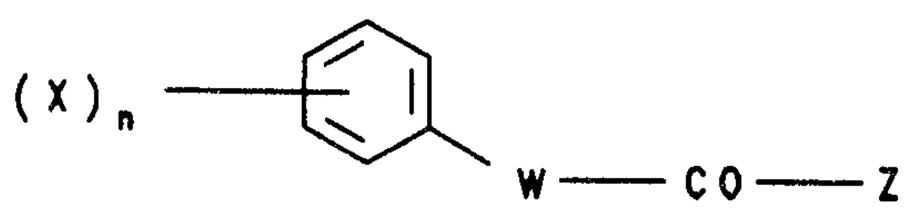
Abstract of the disclosure

Combinations of herbicides and crop-protecting substances

Herbicide/safener combinations of

A) herbicides selected from the group of the 2-acylated 1,3-dicarbonyl compounds or salts thereof, and

B) safeners B1 and/or B2



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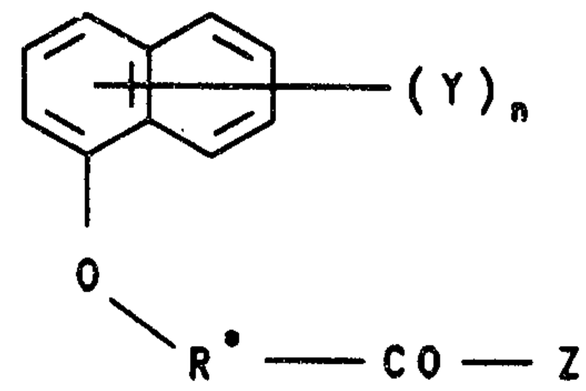


(B2)

as they are defined in claim 1,

are suitable for controlling harmful plants in crops such as cereals, maize and rice.

HOECHST AKTIENGESELLSCHAFT HOE 91/F 417 Dr. WE/bs

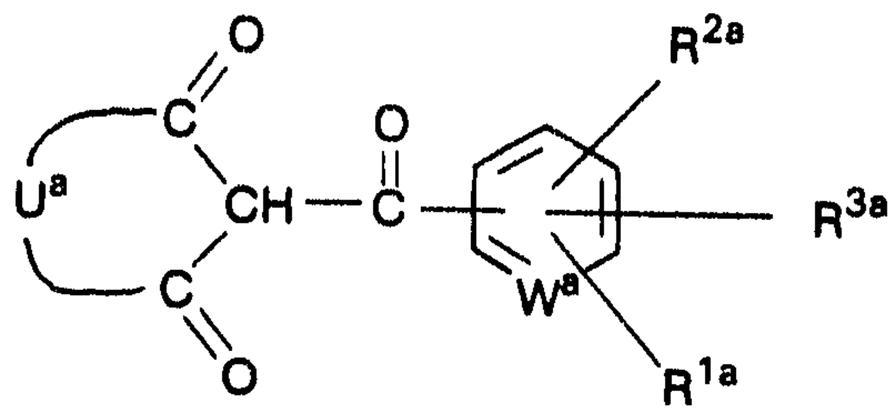
Description

Combinations of herbicides and crop-protecting substances

The invention relates to the technical field of the crop protection agents, in particular active substance/antidote combinations, which are outstandingly suitable for being used against harmful plants in crops of useful plants.

Some more recent herbicidal active substances have very good activities and selectivities and can be used against a broad spectrum of various broad-leaf weeds and/or grass weeds in specific crop stands such as soya beans, maize, rice or cereals. However, other crop plants are harmed by these herbicides, so that they cannot be used in such crops at all, or only at low application rates which do not guarantee the best possible, broad herbicidal activity.

Examples of such herbicides whose application is limited are some herbicides from the group of the 2-acylated cyclic 1,3-dicarbonyl compounds of the formula A or salts thereof,



(A)

in which

R^{1a} and R^{3a} independently of one another are hydrogen, halogen, alkyl, alkoxy, haloalkyl, haloalkoxy, CN, NO_2, $S(O)_mR^{11a}$, $NR^{12a}R^{13a}$, $NR^{14a}C(O)R^{15a}$, $C(O)R^{16a}$

or $OCH_2CH_2OR^{21a}$,

R^{2a} is halogen, CN, NO_2, alkyl, alkoxy, haloalkyl or haloalkoxy, $S(O)_pR^{10a}$, $-O-S(O)_2R^{10a}$, $N(R^{20a})-S(O)_2R^{19a}$,

W^a is nitrogen or CH,

R^{10a} is alkyl, haloalkyl or alkoxy,

R^{11a} is alkyl, haloalkyl, phenyl or benzyl, the last two radicals being unsubstituted or substituted on the phenyl ring, or is $NR^{17a}R^{18a}$,

R^{12a}, R^{13a} independently of one another are hydrogen or alkyl,

R^{14a} is alkyl or hydrogen,

R^{15a} is alkyl or hydrogen,

R^{16a} is hydrogen, alkyl, haloalkyl or alkoxy,

R^{17a} and R^{18a} independently of one another are hydrogen or alkyl,

R^{19a} and R^{20a} independently of one another are alkyl or haloalkyl,

R^{21a} is hydrogen or alkyl,

p is zero, one or two and

U^a and the group of the formula -CO-CH-CO- bonded to it together form a ring which has 5 to 6 ring members and which is carbocyclic or heterocyclic and, apart from the two oxo groups, not substituted or further substituted.

The herbicides of the formula A or the salts thereof are inhibitors of chlorophyll or carotinoid biosynthesis in plants. After plants have been treated with such active substances, the leaves show pale areas and white chloroses which gradually extend over the entire plant and destroy it (compare Weed Technology, 1990, Vol. 4, pages 731-738; WSSA Abstracts, Vol. 31, 1991, Meeting WSSA Febr. 4-7, Abstr. 33, page 11; DE-A-4107141).

Many herbicides of the formula A or salts thereof (compounds A) cannot be employed selectively, or not selectively at sufficiently high dosage rates, in crops of cereals and/or in maize because these crop plants are damaged, at least at the desired dosage rates required for a broad herbicidal activity against broad-leaf weeds and grass weeds.

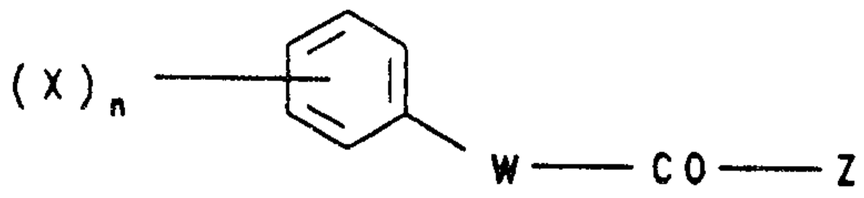
In the case of compounds A, the use of herbicidal antidotes (safeners) such as, for example, chloro- or bromoacetamides, dichloroacetamides, thiazolidines, N-phenylcarbamates, N-phenylsulfonylcarbamates and 1,8-naphthalenedicarboxylic anhydride has already been disclosed. (cf. EP-A-2,986,79 and EP-A-2,986,80).
In some cases, the crop plant such as, for example, wheat, can be protected against the harmful activity of the herbicide (cf. EP-A-2,986,80, Tab. X, P 48).

Entirely unexpectedly, experimental work has now revealed that crop plants such as, for example, wheat, barley, maize or rice, can be protected against undesired damage caused by herbicides of the formula A or salts thereof (compounds A) when they are applied together with certain compounds (B) which act as herbicidal antidotes or safeners.

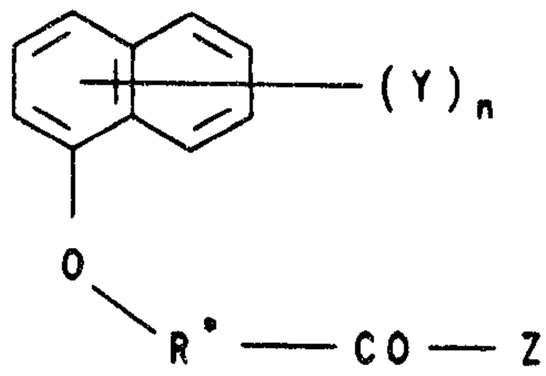
The invention therefore relates to herbicidal compositions which comprise an effective amount of

A) one or more herbicides selected from the group comprising the 2-acylated 1,3-dicarbonyl compounds of the abovementioned formula A or salts thereof, as well as

B) one or more compounds of the formula B1 and B2,



(B1)



(B2)

in which

X is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro or C_1-C_4-haloalkyl,

Y is halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro or C_1-C_4-haloalkyl,

R^* is a C_1-C_2-alkylene chain which can additionally be substituted by one or two C_1-C_4-alkyl radicals, and is preferably $-CH_2-$,

Z is OR^1, SR^1 or NR^1R, preferably a radical of the formula OR^1, NHR^1 or $N(CH_3)R^1$, in particular of the formula OR^1,

R independently of R^1 is hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy or phenyl or substituted phenyl or

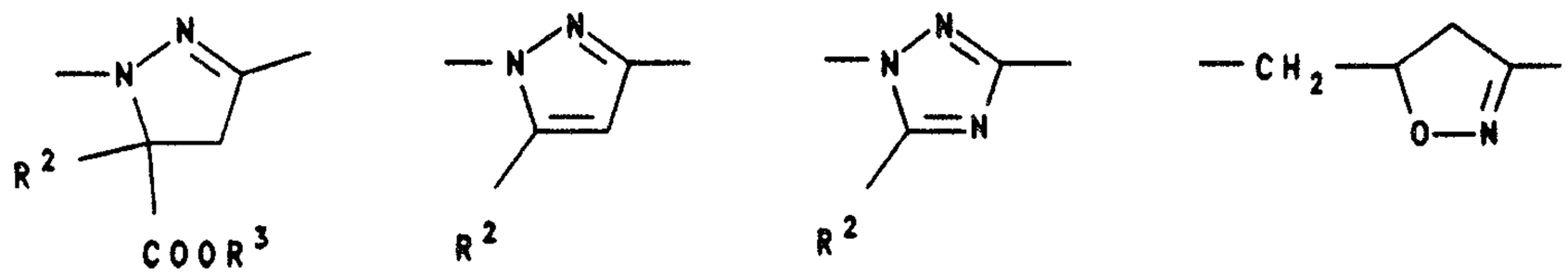
R and R^1 together with the nitrogen atom bonded to them are a saturated or unsaturated 3- to 7-membered heterocycle which has at least one nitrogen atom and up to 3 hetero atoms and which is unsubstituted or substituted by radicals selected from the group comprising C_1-C_4-alkyl, C_1-C_4-alkoxy, phenyl or substituted phenyl,

R^1 independently of R is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-cycloalkyl, C_2-C_8-alkenyl or C_2-C_8-alkynyl, where each of the above carbon-containing radicals independently of one another is unsubstituted or mono- or polysubstituted by radicals selected from the group comprising halogen, hydroxyl, C_1-C_8-alkoxy, C_1-C_8-alkylthio, C_2-C_8-alkenylthio, C_2-C_8-alkynylthio, C_2-C_8-alkenyloxy, C_2-C_8-alkynyloxy, C_3-C_7-cycloalkyl, C_3-C_7-cycloalkoxy, cyano, mono- and di-(C_1-C_4-alkyl)-amino, (C_1-C_8-alkoxy)-carbonyl, (C_2-C_8-alkenyloxy)-

carbonyl, (C_1-C_8-alkylthio)-carbonyl, (C_2-C_8-alkynyloxy)-carbonyl, (C_1-C_8-alkyl)-carbonyl, (C_2-C_8-alkenyl)-carbonyl, (C_2-C_8-alkynyl)-carbonyl, 1-(hydroxyimino)-C_1-C_6-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_6-alkyl, 1-(C_1-C_4-alkoxyimino)-C_1-C_6-alkyl, (C_1-C_8-alkyl)-carbonylamino, (C_2-C_8-alkenyl)-carbonylamino, (C_2-C_8-alkynyl)-carbonylamino, aminocarbonyl, (C_1-C_8-alkyl)-aminocarbonyl, di-(C_1-C_6-alkyl)-aminocarbonyl, (C_2-C_6-alkenyl)-aminocarbonyl, (C_2-C_6-alkynyl)-aminocarbonyl, (C_1-C_8-alkoxy)-carbonylamino, (C_1-C_8-alkyl)-aminocarbonylamino, C_1-C_6-alkylcarbonyloxy, which is unsubstituted or substituted by halogen, NO_2, C_1-C_4-alkoxy or optionally substituted phenyl, furthermore comprising (C_2-C_6-alkenyl)-carbonyloxy, (C_2-C_6-alkynyl)-carbonyloxy, C_1-C_8-alkylsulfonyl, phenyl, phenyl-C_1-C_6-alkoxy, phenyl-(C_1-C_6-alkoxy)-carbonyl, phenoxy, phenoxy-C_1-C_6-alkoxy, phenoxy-(C_1-C_6-alkoxy)-carbonyl, phenylcarbonyloxy, phenylcarbonylamino, phenyl-(C_1-C_6-alkyl)-carbonylamino, the 9 last-mentioned radicals being unsubstituted or mono- or poly-substituted in the phenyl ring by radicals selected from halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C -haloalkoxy and nitro and furthermore comprising radicals of the formulae $-SiR'_3$, $-OSiR'_3$, $(R')_3Si$-C_1-C_6-alkoxy, $-CO-O-NR'_2$, $-O-N=CR'_2$, $-N=CR'_2$, $-O-NR'_2$, $-CH(OR')_2$ and $-O-(CH_2)_m-CH(OR')_2$, in which the R' in the abovementioned formulae independently of one another are halogen, C_1-C_4-alkyl or phenyl which is unsubstituted or mono- or polysubstited by radicals selected from halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy and nitro, or the R', as a pair, are a C_2-C_6-alkylene chain and m is 0 to 6, and furthermore comprising an alkoxy radical of the formula R"O-CR"'(OR")-C_1-C_6-alkoxy, in which the R" independently of one another are C_1-C_4-alkyl or together are a C_1-C_6-alkylene group and R"' is hydrogen or C_1-C_4-alkyl,

n is an integer from 1 to 5, preferably 1 to 3, and

W is a divalent heterocyclic radical having 5 ring atoms, of the formula W1 to W4,



(W1) (W2) (W3) (W4)

in which

R^2 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl, C_3-C_{12}-cycloalkyl or optionally substituted phenyl and

R^3 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, C_1-C_6-hydroxyalkyl, C_3-C_{12}-cycloalkyl or tri-(C_1-C_4-alkyl)-silyl.

Particularly interesting herbicidal compositions according to the invention are those in which, in compounds of the formulae B1 and B2,

R^1 is hydrogen, C_1-C_{12}-alkyl, C_3-C_7-cycloalkyl, C_2-C_8-alkenyl or C_2-C_8-alkynyl,
where each of the abovementioned carbon-containing radicals independently of one another is unsubstituted or mono- or polysubstituted by halogen or mono- or disubstituted, preferably up to monosubstituted, by radicals selected from the group comprising hydroxyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_2-C_4-alkenyloxy, C_2-C_4-alkynyloxy, mono and di-(C_1-C_2-alkyl)-amino, (C_1-C_4-alkoxy)-carbonyl, (C_2-C_4-alkenyloxy)-carbonyl, (C_2-C_4-alkynyloxy)-carbonyl, (C_1-C_4-alkyl-carbonyl, (C_2-C_4-alkenyl)-carbonyl, (C_2-C_4-alkynyl)-carbonyl, 1-(hydroxyimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkoxyimino)-C_1-C_4-alkyl, C_1-C_4-alkylsulfonyl, phenyl,

phenyl-C_1-C_4-alkoxy, phenyl-(C_1-C_4-alkoxy)-carbonyl, phenoxy, phenoxy-C_1-C_4-alkoxy, phenoxy-(C_1-C_4-alkoxy)-carbonyl, where the 6 last-mentioned radicals are unsubstituted or mono- or polysubstituted in the phenyl ring by radicals selected from the group comprising halogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, C_1-C_2-haloalkyl, C_1-C_2-haloalkoxy and nitro, and radicals of the formulae $-SiR'_3$, $-O-N=CR'_2$, $-N=CR'_2$ and $-O-NR'_2$, in which R' in the abovementioned formulae independently of one another are hydrogen, C_1-C_2-alkyl or phenyl which is unsubstituted or mono- or polysubstituted by radicals selected from the group comprising halogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, C_1-C_2-haloalkyl, C_1-C_2-haloalkoxy and nitro, or, in pairs, are a C_4-C_5-alkylene chain.

Other particularly interesting herbicidal compositions according to the invention are those in which, in the compounds of the formulae B1 and B2,

X is hydrogen, halogen, methyl, ethyl, methoxy, ethoxy or C_1-C_2-haloalkyl, preferably hydrogen, halogen or C_1-C_2-haloalkyl, and

Y is halogen, methyl, ethyl, methoxy, ethoxy, or C_1-C_2-haloalkyl, preferably hydrogen, halogen or C_1-C_2-haloalkyl.

Preferred herbicidal compositions according to the invention are those in which, in the compounds of the formula B1,

X is hydrogen, halogen, nitro or C_1-C_4-haloalkyl,

n is a number from 1 to 3,

Z is a radical of the formula OR^1,

R^1 is hydrogen, C_1-C_8-alkyl or C_3-C_7-cycloalkyl,

where each of the abovementioned carbon-containing radicals independently of one another is unsubstituted or mono- or polysubstituted by radicals selected from the group comprising halogen or monosubstituted or disubstituted, preferably

unsubstituted or monosubstituted, by radicals selected from the group comprising hydroxyl, C_1-C_4-alkoxy, (C_1-C_4-alkoxy)-carbonyl, C_2-C_6-alkenyloxy-carbonyl, (C_2-C_6-alkynyloxy)carbonyl, 1-(hydroxyimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkoxyimino)-C_1-C_4-alkyl, and radicals of the formulae $-SiR'_3$, $-O-N=CR'_2$, $-N=CR'_2$- and $-O-NR'_2$, in which the R' in the abovementioned formulae independently of one another are hydrogen or C_1-C_4-alkyl or, in pairs, are C_4-C_5-alkylene chain,

R^2 is hydrogen, C_1-C_8-alkyl, C_1-C_6-haloalkyl, C_3-C_7-cycloalkyl or phenyl and

R^3 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, C_1-C_6-hydroxyalkyl, C_3-C_7-cycloalkyl or tri-(C_1-C_4-alkyl)-silyl.

Other preferred herbicidal compositions according to the invention are those in which, in the compounds of the formula B2,

Y is halogen or C_1-C_4-haloalkyl and n is a number from 1 to 3, preferably $(Y)_n$ = 5-Cl,

Z is a radical of formula OR^1,

R^* is CH_2 and

R^1 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl or (C_1-C_4-alkoxy)-C_1-C_4-alkyl, 1-(hydroxyimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_3-alkyl, 1-(C_1-C_2-alkoxy-imino)-C_1-C_3-alkyl, preferably C_1-C_8-alkyl.

Particularly preferred herbicidal compositions according to the invention are those which contain compounds of the formula B1 in which

W is W1,

X is H, halogen or C_1-C_2-haloalkyl and n is 1-3, in particular $(X)_n$ = 2,4-Cl_2,

Z is a radical of the formula OR^1,

R^1 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl, C_1-C_4-hydroxyalkyl, C_3-C_7-cycloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, tri-(C_1-C_2-alkyl)-silyl, preferably

C_1-C_4-alkyl,

R^2 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl or C_3-C_7-cycloalkyl, preferably hydrogen or C_1-C_4-alkyl, and

R^3 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl, C_1-C_4-hydroxyalkyl, C_3-C_7-cycloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl or tri-(C_1-C_2-alkyl)-silyl, preferably H or C_1-C_4-alkyl.

Other particularly preferred herbicidal compositions according to the invention are those which contain compounds of the formula B1 in which

W is W2,

X is H, halogen or C_1-C_2-haloalkyl and n is 1-3, in particular $(X)_n$ = 2,4-Cl_2,

Z is a radical of the formula OR^1,

R^1 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl, C_1-C_4-hydroxyalkyl, C_3-C_7-cycloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, tri-(C_1-C_2-alkyl)-silyl, preferably C_1-C_4-alkyl and

R^2 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl, C_3-C_7-cycloalkyl or phenyl, preferably hydrogen or C_1-C_4-alkyl.

Other particularly preferred herbicidal compositions according to the invention are those which contain compounds of the formula B1, in which

W is W3,

X is H, halogen or C_1-C_2-haloalkyl and n is 1-3, in particular $(X)_n$ = 2,4-Cl_2,

Z is a radical of the formula OR^1,

R^1 is hydrogen, C_1-C_8-alkyl, C_1-C_4-haloalkyl, C_1-C_4-hydroxyalkyl, C_3-C_7-cycloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, tri-(C_1-C_2-alkyl)-silyl, preferably C_1-C_4-alkyl and

R^2 is C_1-C_8-alkyl or C_1-C_4-haloalkyl, preferably C_1-haloalkyl.

Other particularly preferred herbicidal compositions according to the invention are those which contain compounds of the formula B1 in which

W is W4,

X is hydrogen, halogen, nitro, C_1-C_4-alkyl, C_1-C_2-haloalkyl, preferably CF_3, or C_1-C_4-alkoxy,

n is 1 to 3,

Z is a radical of the formula OR^1,

R^1 is hydrogen, C_1-C_4-alkyl, or (C_1-C_4-alkoxy)-carbonyl-C_1-C_4-alkyl, preferably a radical of the formula (C_1-C_4-alkoxy)-CO-CH_2-, (C_1-C_4-alkoxy)-CO-C(CH_3)H-, HO-CO-CH_2 or HO-CO-C(CH_3)H.

In the formulae, alkyl, alkenyl and alkynyl are straight-chain or branched; the same applies analogously to substituted alkyl, alkenyl and alkynyl radicals such as haloalkyl, hydroxyalkyl, alkoxycarbonyl and the like; alkyl is, for example, methyl, ethyl, n- and i-propyl, n-, i-, t- and 2-butyl, the pentyl radicals, the hexyl radicals such as n-hexyl, i-hexyl and 1,3-dimethylbutyl, the heptyl radicals such as n-heptyl, 1-methylhexyl and 1,4-dimethylpentyl; alkenyl is, for example, allyl, 1-methylprop-2-en-1-yl, but-2-en-1-yl, but-3-en-1-yl, 1-methyl-but-3-ene and 1-methyl-but-2-ene; alkynyl is, for example, propargyl, but-2-yn-1-yl, but-3-yn-1-yl, 1-methyl-but-3-yne; halogen is fluorine, chlorine, bromine or iodine, preferably fluorine, chlorine or bromine, in particular fluorine or chlorine; haloalkyl, haloalkenyl and haloalkynyl are halogen-substituted alkyl, alkenyl or alkynyl, 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, CF_3CH_2O; optionally substituted phenyl is phenyl or substituted phenyl; substituted phenyl is phenyl which is mono- or polysubstituted by radicals selected from the group comprising 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, the dimethyl phenyl radicals, 2-, 3- and

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4-chlorophenyl 2-, 3- and 4-trifluoro- and -trichlorophenyl, 2,4-, 3,5-, 2,5- and 2,3-dichlorophenyl, o-, m- and p-methoxyphenyl.

The compounds of the formula B1 are disclosed in EP-A-0,333,131 (ZA-89/1960), EP-A-0,269,806 (US-A-4,891,057), EP-A-0,346,620 (AU-A-89/34951), WO-91/08202 (International Patent Application PCT/EP 90/01966) and WO-91/07874 (International Patent Application No. PCT/EP 90/02020) and literature cited therein, or they can be prepared by, or analogously to, the processes described therein. The compounds of the formula B2 are disclosed in EP-A-94349 (US-A4,902,340), EP-A-0,191,736 (US-A-4,881,966) and copending Canadian Patent Application 2,058,276, filed December 20, 1991 and the literature cited therein, or they can be prepared by, or analogously to, the processes described therein.

Suitable according to the invention as compounds A are 2-acylated cyclic 1,3-dicarbonyl compounds or salts thereof which can only be employed favorably in cereal crops, rice and/or maize in combination with compounds of type B since they inflict too much damage on the crop plants on their own without safener of the type B. Examples of interesting compounds of the abovementioned formula A of salts thereof, which can be used according to the invention, are those in which

R^{1a} and R^{3a} independently of one another are hydrogen, halogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_3)-haloalkoxy, CN, NO_2, $S(O)_mR^{11a}$, $NR^{12a}R^{13a}$, $NR^{14a}C(O)R^{15a}$, $C(O)R^{16a}$, $OCH_2CH_2OR^{21a}$,

R^{2a} is halogen, CN, NO_2, (C_1-C_4)-alkyl, $(C_1-C_4$-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, $S(O)_pR^{10a}$, $-O-S(O)_2R^{10a}$, $N(R^{20a})-S(O)_2R^{19a}$,

W^a is nitrogen or CH,

U^a is a divalent group of the formula $-X^a-(Ya)_n-Z^a-$,

X^a is $CR^{4a}R^{5a}$ or $N-R^{22a}$,

Y^a is $CR^{6a}R^{7a}$, carbonyl, oxygen, sulfur, $N-R^{23a}$ or $C=CH_2$,

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Z^a is $CR^{8a}R^{9a}$, N-R^{24a}, oxygen or sulfur,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, halogen, hydroxyl, (C_1-C_4)-alkyl, (C_1-C_4)-alkylthio, [(C_1-C_4)-alkoxy]-carbonyl, (C_3-C_6)-cycloalkyl or phenyl, the 5 last-mentioned hydrocarbon-containing radicals being unsubstituted or substituted by one or more halogen atoms,

R^{10a} is (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl or (C_1-C_4)-alkoxy,

R^{11a} is (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl, phenyl, substituted phenyl, benzyl or $NR^{17a}R^{18a}$,

R^{12a}, R^{13a} independently of one another are hydrogen or (C_1-C_4)-alkyl,

R^{14a} is hydrogen or (C_1-C_4)-alkyl,

R^{15a} is hydrogen or (C_1-C_4)-alkyl,

R^{16a} is hydrogen, (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl or (C_1-C_4)-alkoxy,

R^{17a} and R^{18a} independently of one another are hydrogen or (C_1-C_4)-alkyl,

R^{19a} and R^{20a} independently of one another are (C_1-C_4)-alkyl or (C_1-C_4)-haloalkyl,

R^{21a}, R^{22a}, R^{23a} and R^{24a} independently of one another are hydrogen or (C_1-C_4)-alkyl, and

m, n and p in dependently of one another are zero or one.

Preferred compounds of the abovementioned formulae or salts thereof, which can be employed according to the invention, are those in which

R^{1a} and R^{3a} independently of one another are hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, $-SO_2R^{11a}$, $NR^{12a}R^{13a}$, $-N(CH_3)-C(O)R^{15a}$, [(C_1-C_4)-alkoxy]-carbonyl, (C_1-C_2)-alkyl, (C_1-C_2)-alkoxy, $OCH_2CH_2OR^{21a}$, (C_1-C_2-haloalkyl, (C_1-C_2)-haloalkoxy or (C_1-C_2)-alkylthio,

R^{2a} is fluorine, chlorine, bromine, iodine, cyano, nitro, $S(O)_pR^{10a}$, (C_1-C_3)-alkyl, (C_1-C_2)-alkoxy, (C_1-C_3)-haloalkyl or (C_1-C_2)-haloalkoxy,

U^a is a divalent group of the formula $-X^a-(Ya)_n-Z^a-$,

W^a is nitrogen or CH,

X^a is $CR^{4a}R^{5a}$ or $N-R^{22a}$,

Y^a is $CR^{6a}R^{7a}$, carbonyl, oxygen, sulfur, $N-R^{23a}$ or $C=CH_2$,

Z^a is $CR^{8a}R^{9a}$, $N-R^{24a}$, oxygen or sulfur,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, fluorine, chlorine, bromine, hydroxyl (C_1-C_3)-alkyl, (C_4-C_6)-cycloalkyl, (C_1-C_2)-alkylthio and phenyl, the 4 last-mentioned hydrocarbon-containing radicals being unsubstituted or substituted by one or more halogen atoms and

R^{21a}, R^{22a}, R^{23a} and R^{24a} independently of one another are (C_1-C_4)-alkyl, and R^{10a}, R^{11a}, R^{12a}, R^{13a}, R^{15a}, p and n are as defined above.

Particularly preferred compounds of the formula A or salts thereof are those in which

R^{1a} and R^{3a} independently of one another are hydrogen, fluorine, chlorine, bromine, methoxy, ethoxy, methyl, trifluoromethoxy, difluoromethoxy, $OCH_2CH_2OCH_3$, nitro, trifluoromethyl, methylthio, $-SO_2CH_3$, $SO_2CH_2CH_3$, $SO_2CH_2CH_2CH_3$, SO_2CH_2Cl, $-N(CH_3)_2$, OCH_2CH_2Cl, OCH_2CF_3, $SO_2N(CH_3)_2$, ethyl, n-propyl or $[(C_1-C_4)$-alkoxy]-carbonyl,

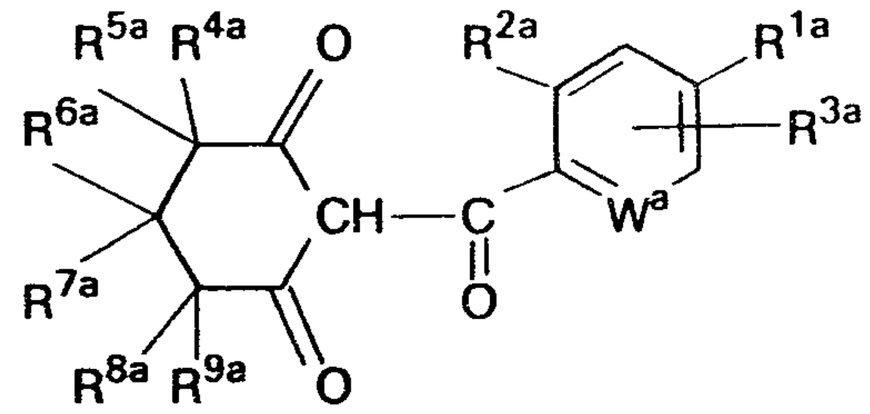
R^{2a} is fluorine, chlorine, bromine, iodine, cyano, nitro, $S(O)_pR^{10a}$, (C_1-C_3)-alkyl, (C_1-C_2)-alkoxy, (C_1-C_3)-haloalkyl or (C_1-C_2)-haloalkoxy,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, methyl, ethyl, propyl, isopropyl, cyclopentyl, hydroxyl, methylthio, fluorine, chlorine, bromine and phenyl which is optionally substituted by one or more halogen atoms, and

p is two

Tables 1 to 5 below give examples of the abovementioned herbicidal 2-acyl-1,3-dicarbonyl compounds of the formula A.

Table 1



Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	R^{8a}	R^{9a}	W^a
1	Cl	NO_2	H	H	H	H	H	H	H	CH
2	H	NO_2	H	H	H	CH_3	CH_3	H	H	$C(CH_3)$
3	$SO_2C_2H_5$	Cl	H	H	H	H	H	H	H	CH
4	$SO_2C_2H_5$	Cl	H	H	H	CH_3	CH_3	H	H	CH
5	NO_2	Cl	H	CH_3	CH_3	H	H	H	H	CH
6	Cl	NO_2	H	CH_3	CH_3	H	H	H	H	CH
7	Cl	NO_2	H	H	H	CH_3	CH_3	H	h	CH
8	H	H	3-CF_3O	H	H	CH_3	CH_3	H	H	CH
9	F	Cl	H	H	H	CH_3	CH_3	H	H	CH

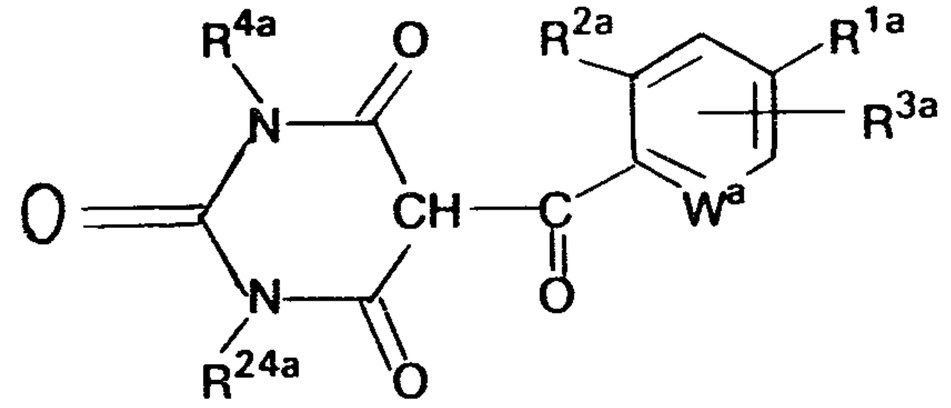
Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	R^{8a}	R^{9a}	W^a
10	SO_3CH_3	Cl	H	H	i-C_3H_7	H	H	H	H	CH
11	H	NO_2	H	CH_3	CH_3	H	H	H	H	CH
12	H	NO_2	H	H	CH_3	H	H	CH_3	CH_3	CH
13	Cl	NO_2	H	CH_3	H	H	H	CH_3	CH_3	CH
14	NO_2	Cl	H	CH_3	CH_3	H	H	CH_3	H	CH
15	Cl	Cl	H	i-C_3H_7	H	H	H	H	H	CH
16	SO_2CH_3	Cl	3-OC_2H_5	H	H	H	H	H	H	CH
17	H	CN	H	CH_3	CH_3	H	H	H	H	CH
18	CF_3	NO_2	H	H	H	H	H	H	H	CH
19	SO_2CH_3	NO_2	H	CH_3	CH_3	H	H	H	H	CH
20	SO_2CH_3	Cl	H	H	H	H	H	H	H	CH
21	SO_2CH_2Cl	NO_2	H	CH_3	CH_3	H	H	H	H	CH
22	CF_3	Cl	H	H	H	H	H	H	H	N

Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	R^{8a}	R^{9a}	W^a
23	SO_2CH_3	Cl	H	H	H	H	H	H	H	N
24	CF_3	NO_2	H	CH_3	CH_3	H	OH	CH_3	CH_3	CH
25	H	SO_2CH_3	H	CH_3	CH_3	H	H	CH_3	H	CH
26	$SO_2CH_2CH_2CH_3$	SCH_3	H	H	H	H	H	H	H	CH
27	SO_2CH_3	CH_3	H	CH_3	CH_3	H	H	H	CH_3	CH
28	$SO_2CH_2CH_3$	CH_3	3-Cl	H	H	H	H	H	H	CH
29	SCH_2CH_3	CF_3	H	H	H	H	H	H	H	CH
30	CF_3	CF_3	H	CH_3	CH_3	H	H	H	H	CH
31	H	NO_2	H	H	H	H	H	CH_3	SCH_3	CH
32	SO_2CH_3	Cl	H	H	H	H	CH_3	2-F-C_6H_4	H	CH
33	Cl	NO_2	H	H	H	H	H	H	2-F-C_6H_4	CH
34	SO_2CH_3	Cl	H	-C_6H_5	H	H	H	H	H	CH
35	SO_2CH_3	Cl	H	CH_3	CH_3	C_6H_5	H	H	H	CH

Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	R^{8a}	R^{9a}	W^a
36	Cl	NO_2	H	H	H	H	C_6H_5	H	H	CH
37	SO_2CH_3	Cl	H	SCH_3	H	H	H	H	H	CH
38	Cl	NO_2	H	H	H	H	H	H	SCH_3	CH
39	SO_2CH_3	Cl	H	H	Br	H	H	H	H	CH
40	H	NO_2	H	Br	H	H	H	CH_3	CH_3	CH
41	Cl	Cl	H	Cl	H	H	H	H	H	CH
42	CF_3	NO_2	H	F	H	CH_3	CH_3	H	H	CH_3-9
43	SO_2CH_3	Cl	H	H	H	CH_3	CH_3	H	H	CH
44	SO_2CH_3	Cl	H	CH_3	CH_3	H	H	H	H	CH
45	SO_2CH_3	Cl	H	CH_3	CH_3	H	H	H	CH_3	CH
46	CF_3	NO_2	H	CH_3	CH_3	H	H	H	H	CH
47	OCF_2H	NO_2	H	H	H	H	H	H	H	CH
48	OCF_2H	NO_2	H	CH_3	CH_3	H	H	H	H	CH

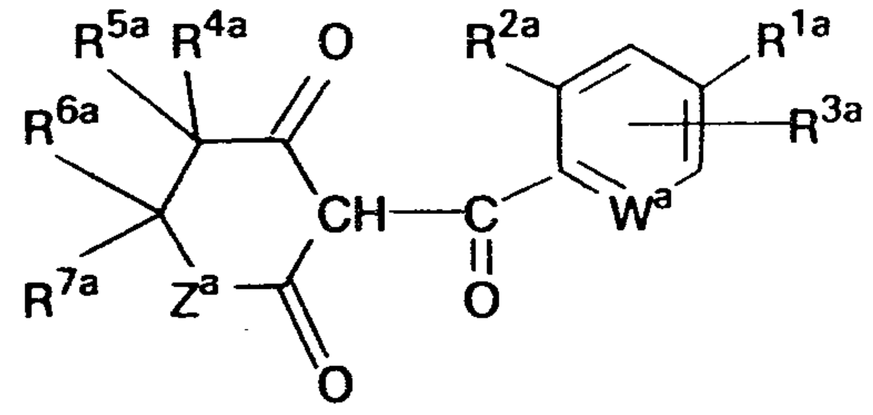
Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	R^{8a}	R^{9a}	W^a
49	$SO_2CH_2CH_2CH_3$	Cl	3-OCH_2-CH_2OCH_3	H	H	H	H	H	H	CH

Table 2



Ex.	R^{1a}	R^{2a}	R^{3a}	R^{22a}	R^{24a}
1	Cl	Cl	H	CH_3	CH_3
2	H	NO_2	H	CH_3	CH_3
3	$SO_2C_2H_5$	Cl	3-$CH_2CH_2CH_3$	CH_3	CH_3

Table 3



Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{6a}	R^{7a}	Z^a
1	Cl	Cl	H	H	H	$=CH_2$		O
2	H	NO_2	H	CH_3	H	H	H	O
3	Cl	NO_2	H	CH_3	H	CH_3	H	O
4	SO_2CH_3	Cl	H	H	CH_3	H	CH_3	S
5	Cl	NO_2	H	H	H	H	H	N-$CH_2CH_2CH_3$
6	SO_2CH_3	Cl	H	H	H	H	H	N-$CH_2CH_2CH_3$
7	Cl	NO_2	H	H	H	CH_3	CH_3	N-CH_3
8	SO_2CH_3	NO_2	H	H	CH_3	H	H	N-CH_2CH_3

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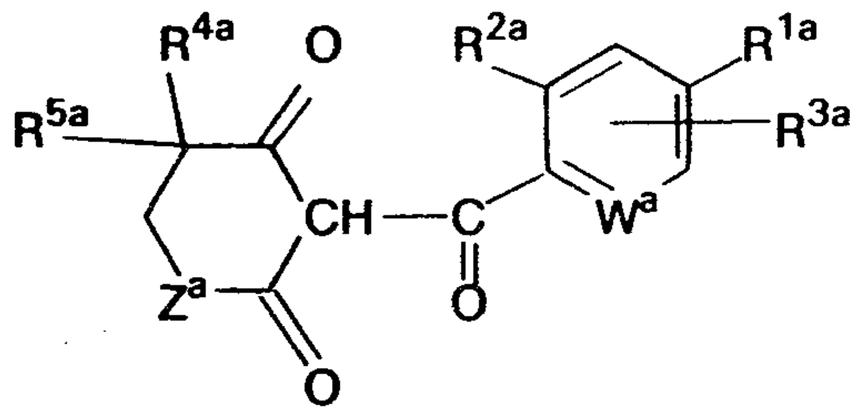
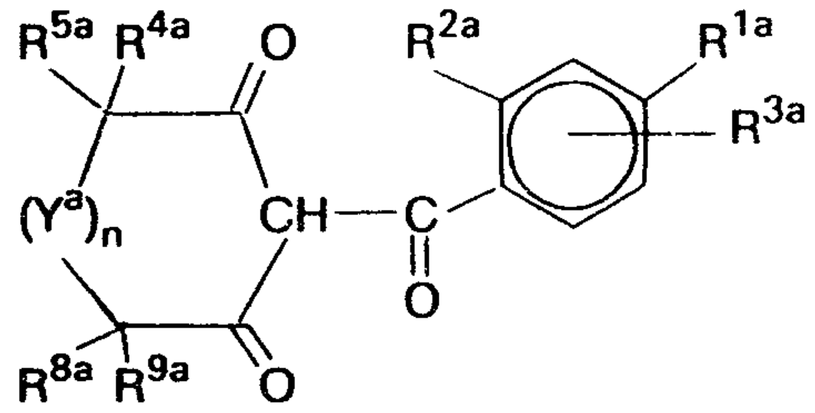
Table 4



Ex.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	Z^a
1	Cl	Cl	H	H	H	O
2	H	NO_2	H	CH_3	H	O
3	Cl	NO_2	H	CH_3	H	O
4	SO_2CH_3	Cl	H	H	CH_3	S
5	Cl	NO_2	H	H	H	N-$CH_2CH_2CH_3$
6	SO_2CH_3	Cl	H	H	H	N-$CH_2CH_2CH_3$
7	Cl	NO_2	H	H	H	N-CH_3
8	SO_2CH_3	NO_2	H	H	CH_3	N-CH_2CH_3

Table 5



Ex.No.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{8a}	R^{9a}	Y^a
1	Cl	NO_2	H	CH_3	CH_3	H	H	O
2	Cl	Cl	H	H	H	H	H	S
3	Cl	Cl	H	CH_3	H	CH_3	H	S
4	H	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O
5	Cl	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O
6	SO_2CH_3	Cl	H	CH_3	CH_3	CH_3	CH_3	C=O
7	$SO_2CH_2CH_3$	CH_3	H	CH_3	CH_3	CH_3	CH_3	C=O
8	SO_2CH_2Cl	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O

Ex.No.	R^{1a}	R^{2a}	R^{3a}	R^{4a}	R^{5a}	R^{8a}	R^{9a}	Y^a
9	$SO_2CH_2CH_3$	Cl	3-OCH_2CH_3	CH_3	CH_3	CH_3	CH_3	C=O
10	SO_2CH_3	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O
11	$SO_2N(CH_3)_2$	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O
12	CF_3	NO_2	H	CH_3	CH_3	CH_3	CH_3	C=O
13	$SO_2CH_2CH_3$	Cl	3-Cl	CH_3	CH_3	CH_3	CH_3	C=O
14	Br	Br	3-$OCH_2CH_2OCH_3$	CH_3	CH_3	H	H	CH_2
15	$SO_2CH_2CH_2CH_3$	Br	3-$OCH_2CH_2OCH_3$	H	H	H	H	CH_2
16	$SO_2CH_2CH_3$	Cl	3-$OCH_2CH_2OCH_3$	H	H	H	H	CH_2

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Mixtures of compounds A and the sulfonyl urea derivatives and/or imidazolinones are also suitable according to the invention for being employed together with the safeners B; the respective sulfonylureas and imidazolinones are described, for example, in European Patent Application No. 91121622.4 (EP-A-0492366).

Examples which are suitable as safeners B for the abovementioned herbicidal compounds A are the following groups of compounds of the formulae B1 and B2:

a) Compounds of the dichlorophenylpyrazoline-3-carboxylic acid type (i.e. of the formula B1, in which W = W1 and $(X)_n$ = 2,4-Cl_2), preferably compounds such as

(B1-1) Ethyl 1-(2,4-dichlorophenyl)-5-(ethoxycarbonyl)-5-methyl-2-pyrazoline-3-carboxylate and related compounds as they are described in WO-91-/07874 (International Patent Application No. PCT/EP 90/02020),

b) dichlorophenylpyrazolecarboxylic acid derivatives (i.e. of the formula B1 in which W = W2 and $(X)_n$ = 2,4-Cl_2), preferably compounds such as

(B1-2) ethyl 1-(2,4-dichlorophenyl)-5-methylpyrazole-3-carboxylate,

(B1-3) ethyl 1-(2,4-dichlorophenyl)-5-isopropylpyrazole-3-carboxylate,

(B1-4) ethyl 1-(2,4-dichlorophenyl)-5-(1,1-dimethyl-ethyl)pyrazole-3-carboxylate,

(B1-5) ethyl 1-(2,4-dichloropheny)-5-phenylpyrazole-3-carboxylate,

and related compounds as they are described in EP-A-0,333,131 and EP-A-0,269,806,

c) compounds of the triazolecarboxylic acid type (i.e. of the formula B1 in which W = W3 and $(X)_n$ = 2,4-Cl_2), preferably compounds such as

(B1-6) ethyl 1-(2,4-dichlorophenyl)-5-trichloromethyl-(1H)-1,2,4-triazole-3-carboxylate

(fenchlorazole)

and related compounds (see EP-A-0174562 and EP-A-0,346,620);

d) Compounds of the dichlorobenzyl-2-isoxazoline-3-carboxylic acid type (i.e. of the formula B1 in which W = W4 and $(X)_n$ = 2,4-Cl_2), preferably compounds such as

(B1-7) ethyl 5-(2,4-dichlorobenzyl)-2-isoxazoline-3-carboxylate

and related compounds as they are described in WO-91/08202 (International Patent Application No. PCT/EP 90/01966),

e) compounds of the dichlorophenylpyrazoline-3-carboxylate type, for example

(B1-8) 3-ethyl 5-t-butyl 1-(2,4-dichlorophenyl)-pyrazolinecarboxylate,

as they are described in WO-91/07874,

f) Compounds of the (5-chloro-8-quinolinoxy)acetic acid type (i.e. of the formula B2 in which $(Y)_n$ = 5-Cl, Z = OR^1, R* = CH_2), preferably compounds such as

(B2-1) 1-methylhex-1-yl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-2) 1,3-dimethylbut-1-yl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-3) 4-methylpent-2-yl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-4) 2-heptyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-5) 1-methylethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-6) ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-7) 2-phenoxyethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-8) 2-methyl-1-propen-3-yl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-9) 2-methyl-3-oxo-butyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-10) 2-(pent-3-ylidene-iminooxy)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-11) (2,2-dimethyl)-1,3-dioxolan-4-yl)methyl 2-(5-

chloro-8-quinolinoxy)acetate,

(B2-12) (allyoxycarbonyl)methyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-13) 2-(isopropylideniminooxy)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-14) trimethylsilylmethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-15) 2-(trifluoromethylcarbonylamino)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-16) 2-(methoxyimino)propyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-17) 4-(acetoxyimino)pentyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-18) 2-(benzamido)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-19) 4-(hydroxyimino)pentyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-20) 2-(acetoxy)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-21) 2-(2-methyl-prop-2-en-1-yl)ethyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-22) 3-(propargyloxy)propyl 2-(5-chloro-8-quinolinoxy)acetate,

(B2-23) N,N-dimethyl-2-(5-chloro-8-quinolinoxy)acetamide,

(B2-24) N-(2-acetoxy-ethyl)-2-(chloro-8-quinolinoxy)acetamide,

(B2-25) 2-(allyloxy)propyl 2-(5-chloro-8-quinolinoxy)acetate,

and related compounds as they are described in EP-A-94,349 (US-A4,902,340), EP-A-0191736 (US-A-4,881,966) and copending Canadian Patent Application 2,058,276.

The safeners (antidotes) of the above groups a) to f) reduce, or inhibit, phytotoxic effects which can occur when the herbicidal compounds A are used in crops of useful plants, without adversely affecting the activity of these herbicides against harmful plants. This allows

the field of application of conventional crop protection agents to be considerably widened and extended, for example to crops such as wheat, barley, maize and other Gramineae crops in which the use of the herbicides was hitherto not possible or only possible to a limited extent, i.e. at low dosage rates where the range of activity was narrow.

The herbicidal active substances and the safeners mentioned can be applied together (as a finished formulation or by the tank mix method) or in succession in any desired sequence. The ratio by weight of safener:herbicide can vary within wide limits and is preferably in the range from 1:10 to 10:1, in particular from 1:10 to 5:1. The amounts of herbicides and safeners which are optimal in each case depend on the nature of the herbicide used or on the safener used, and on the species of the plant stand to be treated, and can be determined in each individual case by appropriate preliminary experiments.

The main field of application for using the safeners are especially cereal crops (wheat, rye, barley, oats), rice, maize, sorghum, but also cotton and soya beans, preferably cereals and maize.

Depending on their properties, the safeners of the type B can be used for pretreating the seed of the crop plant (seed dressing) or they can be incorporated into the seed furrows before sowing or applied together with the herbicide before or after emergence of the plants. Pre-emergence treatment includes the treatment of the area under cultivation before sowing and the treatment of the area under cultivation where seed has been sown but where the plants have not emerged yet. Post-emergence application together with the herbicide is preferred. Tank mixes or finished formulations can be employed to this end.

Compared with the seed-dressing method, the method where herbicide and safener are applied together post-emergence represents an important advantage for farming practice. The farmer reduces the costs substantially by applying the substances in a single operation and, above all, labor-intensive seed dressing, which requires a specific seed-dressing apparatus, can be dispensed with. In contrast, the technological requirement for additionally applying the safener is virtually negligible, in particular when herbicide and safener are employed and used in the form of a finished formulation.

The amounts of safener required can vary within wide limits depending on the indication and the herbicide used and are, as a rule, in the range from 0.001 to 5 kg, preferably 0.005 to 0.5 kg, of active substance per hectare.

The present invention therefore also relates to a method of protecting crop plants against phytotoxic secondary effects of herbicidal compounds A, which comprises applying an effective amount of a compound of the abovementioned formula B1 or B2 prior to, after, or simultaneously with, the herbicide A, preferably together with the herbicide A, post-emergence to the plants, seeds of plants or the area under cultivation.

The compounds B and their combinations with one or more of the abovementioned herbicides can be formulated in many ways, depending on which biological and/or chemico-physical parameters prevail. The following possibilities are therefore suitable for formulation: wettable powders (WP), water-soluble powders (SP), water-soluble concentrates, emulsifiable concentrates (EC), emulsions (EW) such as oil-in-water and water-in-oil emulsions, sprayable solutions, suspension concentrates (SC), dispersions on an oil or water base, oil-miscible solutions, capsule suspensions (CS), dusting agents (DP),

seed-dressing agents, granules for broadcasting and soil application, granules (GR) in the form of microgranules, spray granules, coated granules and adsorption granules, water-dispersible granules (WG), water-soluble granules (SG), ULV formulations, microcapsules and waxes.

The abovementioned formulation types are known in principle and are described, for example in: Winnacker-Küchler, "Chemische Technologie [Chemical Technology]", Volume 7, C. Hauser Verlag Munich, 4th Ed., 1986; Wade van Valkenburg, "Pesticides Formulations", Marcel Dekker N.Y., 2nd Ed. 1973; K. Martens, "Spray Drying Handbook", 3rd Ed. 1979, G. Goodwin Ltd. London.

The formulation auxiliaries required, such as inert materials, surfactants, solvents and other additives, are also known and are described, for example, in: Watkins, "Handbook of Insecticide Dust Diluents and Carriers", 2nd Ed., Darland Books, Caldwell N.J., H. v. Olphen, "Introduction to Clay Colloid Chemistry", 2nd Ed., J. Wiley & Sons, N. Y.; C. Marsden, "Solvents Guide", 2nd Ed., Interscience, N.Y. 1963; McCutcheon's "Detergents and Emulsifiers Annual", MC Publ. Corp. Ridgewood N. J.; Sisley and Wood, "Encylopedia of Surface Active Agents", Chem. Publ. Co. Inc., N.Y. 1964; Schönfeldt, "Grenzflächenaktive Äthylenoxidaddukte" [Surface-active Ethylene Oxide Adducts]", Wiss. Verlagsgesell., Stuttgart 1976; Winnacker-Küchler, "Chemische Technologie [Chemical Technology]", Volume 7, C. Hauser Verlag Munich, 4th Ed. 1986.

Combinations with other pesticidally active substances, such as insecticides, acaricides, herbicides, fungicides, safeners, fertilizers and/or growth regulators may also be prepared on the basis of these formulations, for example in the form of a readymix or as a tank mix.

Wettable powders are preparations which are uniformly dispersible in water and which, besides the active substance and/or safener, also contain surfactants of ionic and/or non-ionic nature (wetting agents, dispersants), for example polyoxethylated alkylphenols, polyoxethylated fatty alcohols, polyoxethylated fatty amines, fatty alcohol polyphenol ether sulfates, alkanesulfonates, alkylbenzenesulfonates, sodium ligninsulfonate, sodium 2,2'-dinaphthylmethane-6,6'-disulfonate, sodium dibutylnaphthalenesulfonate, or alternatively sodium oleoylmethyltaurate, in addition to a diluent or inert substance. To prepare the wettable powders, the herbicidal active substances are ground finely, for example in customary apparatuses such as hammer mills, blowing mills and air-jet mills, and mixed with the formulation auxiliaries either simultaneously of in succession.

Emulsifiable concentrates are prepared by dissolving the active substance and/or safener in an organic solvent, for example butanol, cyclohexanone, dimethylformamide, xylene and also higher-boiling aromatic compounds or hydrocarbons or mixtures of the organic solvents, with the addition of one or more surfactants of ionic or non-ionic nature (emulsifiers). Examples of emulsifiers which can be used are: calcium salts of an alkylarylsulfonic acid, such as calcium dodecylbenzenesulfonate, or non-ionic emulsifiers, such as fatty acid polyglycol esters, alkylaryl polyglycol ethers, fatty alcohol polyglycol ethers, propylene oxide/ethylene oxide condensation products, alkyl polyethers, sorbitan esters such as sorbitan fatty acid esters, polyoxyethylene sorbitan esters such as polyoxyethylene sorbitan fatty acid esters.

Dusting agents can be obtained by grinding the active substance and/or the safener with finely divided solid substances, for example talc, natural clays, such as

kaolin, bentonite and prophyllite, or diatomaceous earth.

Suspension concentrates can be oil- or water-based. They can be prepared, for example, by wet grinding by means of commercially available bead mills and, if appropriate, an addition of surfactants as have already been mentioned for example above in the case of the other formulation types.

Emulsions, for example oil-in-water emulsions (EW) can be prepared for example by means of stirrers, colloid mills and/or static mixers using aqueous organic solvents and, if appropriate, surfactants as have already been mentioned for example above in connection with the other formulation types.

Granules can be produced either by spraying the active substance and/or the safener onto adsorptive, granulated inert material or by applying active substance concentrates onto the surface of carriers, such as sand, kaolinites or granulated inert material, by means of binders, for example polyvinyl alcohol, sodium polyacrylate or, alternatively, mineral oils. Suitable active substances can also be granulated in the manner which is conventional for the production of fertilizer granules, if desired in a mixture with fertilizers.

Water-dispersible granules are produced, as a rule, by the conventional processes such as spray-drying, fluidized-bed granulation, plate granulation, mixing by means of high-speed stirrers and extrusion without solid inert material. To produce plate, fluidized-bed, extruder and spray granules, see, for example processes in "Spray-Drying Handbook" 3rd ed. 1979, G. Goodwin Ltd., London; J. E. Browning, "Agglomeration", Chemical and Engineering 1967, pages 147 et seq. "Perry's Chemical Engineer's Handbook", 5th Ed., McGraw-Hill, New York 1973, pp. 8-57.

For more details with regard to the formulation of crop-protection agents see, for example, G. C. Klingman, "Weed Control as a Science", John Wiley and Sons, Inc., New York, 1961, pages 81-96 and J. D. Freyer, S. A. Evans, "Weed Control Handbook", 5th Ed., Blackwell Scientific Publications, Oxford, 1968, pages 101-103.

As a rule, the agrochemical preparations contain 0.1 to 99% by weight, in particular 0.1 to 95% by weight, of active substance of the formula (I).

The concentration of active substance in wettable powders is, for example, about 10 to 90% by weight; the remainder to 100% by weight is composed of conventional formulation components. In the case of emulsifiable concentrates, the concentration of active substance can be about 1 to 90, preferably 5 to 80% by weight. Formulations in the form of dusts usually contain 1 to 30, preferably 5 to 20% by weight of active substance, sprayable solutions about 0.05 to 80, preferably 2 to 50% by weight. In the case of water-dispersible granules, the active substance content depends partly on whether the active compound is liquid or solid and on which granulation auxiliaries, fillers etc. are used. Water-dispersible granules contain, for example, between 1 and 95% by weight, preferably between 10 and 80% by weight, of active substance.

In addition, the active substance formulations mentioned contain, if appropriate, the adhesives, wetting agents, dispersing agents, emulsifiers, penetrants, preservatives, antifreeze agents, solvents, fillers, carriers, colorants, defoamers, evaporation inhibitors and pH and viscosity regulators which are conventional in each case.

For use, the formulations, present in commercially available form, are diluted, if appropriate, in the customary manner, for example water in the case of

wettable powders, emulsifiable concentrates, dispersions and water-dispersible granules. Preparations in the form of dusts, granules and sprayable solutions are usually not further diluted with other inert substances before use. Particularly good efficacies of the compositions according to the invention can be achieved by adding other wetting agents, in addition to the surfactants contained in the formulations at concentrations from 0.1 to 0.5% by weight by the tank mix method, for example non-ionic wetting agents or wetting agents of the fatty alcohol polyol ether sulfate type (see, for example, DE-A-4,029,304 = EP-A-0,476,555 or ZA-91/7266).

The application rate of safener required varies, inter alia, with the external conditions such as temperature, moisture and the nature of the herbicide used.

A. Formulation Examples

a) A dusting agent is obtained by mixing 10 parts by weight of a compound of the type B or of an active substance mixture of a herbicidal compound A and a safener of the type B and 90 parts by weight of talc as inert substance and comminuting the mixture in a hammer mill.

b) A wettable powder which is readily dispersible in water is obtained by mixing 25 parts by weight of a compound of the type B or of an active substance mixture of a herbicide A and a safener of the type B, 64 parts by weight of kaolin-containing quartz as the inert substance, 10 parts by weight of potassium ligninsulfonate and 1 part by weight of sodium oleoylmethyltaurate as the wetting and dispersing agent, and grinding the mixture in a pinned-disk mill.

c) A dispersion concentrate which is readily dispersible in water is obtained by mixing 20 parts by weight of a compound of the type B or of an active substance mixture of a herbicide A and a safener of the type B with 6 parts by weight of alkylphenol polyglycol ether (®Triton X 207), 3 parts by weight of isotridecanol polyglycol ether (8 EO) and 71 parts by weight of paraffinic mineral oil (boiling range, for example, about 255 to above 277°C), and grinding the mixture in a ball mill to a fineness of below 5 microns.

d) An emulsifiable concentrate is obtained from 15 parts by weight of a compound of the type B or of an active substance mixture of a herbicide A and a safener of the type B, 75 parts by weight of cyclohexanone as the solvent and 10 parts by weight of oxethylated nonylphenol as the emulsifier.

e) Water-dispersible granules are obtained by mixing

75 parts by weight		of a compound B or an active substance mixture of herbicide A and a safener B,
10	"	of calcium ligninsulfonate,
5	"	of sodium lauryl sulfate,
3	"	of polyvinyl alcohol and
7	"	of kaolin,

grinding the mixture on a pinned-disk mill and granulating the powder in a fluidized bed by spraying on water as granulation liquid.

f) Alternatively, water-dispersible granules are obtained by homogenizing and precomminuting

25 parts by weight		of a compound B or an active substance mixture of a herbicide A and a safener B,
5	"	of sodium 2,2'-dinaphthalmethane-6,6'-disulfonate,

2 " of sodium oleoylmethyltaurate,
1 part by weight of polyvinyl alcohol,
17 parts by weight of calcium carbonate and
50 " of water

on a colloid mill, subsequently grinding the mixture on a bead mill and atomizing and drying the resulting suspension in a spray tower by means of a single-substance nozzle.

B. Biological examples

The crop plants, broad-leaf weeds and grass weeds were grown in plastic pots in the field or in the greenhouse until they had reached the four- to five-leaf stage and then, post-emergence, treated according to the invention with compounds of type A) and B). The compounds of type A) and B) were applied in the form of aqueous suspensions or emulsions at an application rate of 300 l of water/ha (converted). 4 weeks after the treatment, the plants were assessed visually for any type of damage by the herbicides applied, and the extent of prolonged damage to the plants was particularly taken into account. The assessment was in percentages in comparison with untreated controls.

The results of Tables 6 and 7 below demonstrate that the compounds of type B, which were used according to the invention, are capable of effectively reducing severe herbicidal damage of crop plants. Even when the herbicides are highly overdosed, severe damage in the crop plants are markedly reduced and lesser damage is compensated for completely. Mixtures of herbicides and compounds of type B are therefore outstandingly suitable for selective weed control in crops such as cereals and maize.

Table 6: Greenhouse experiment

Herbicide [Table/No.]	Safener	Dosage rate [g AS/ha]	% damage on crop plant and weeds: wheat	APSV	GAAP
Table 1, Ex. No. 20	-	1000	60	93	99
		500	55	70	99
		250	30	60	85
		125	10	50	75
	"	+ B1-1 1000+1000	0	95	99
		500+ 500	0	90	98
		250+ 250	0	80	90
		125+ 125	0	70	70
	"	+ B1-6 1000+1000	0	95	98
		500+ 500	0	95	93
		250+ 250	0	85	90
		125+ 125	0	50	65
	"	+ B2-1 1000+1000	0	90	97
		500+ 500	0	85	94
		250+ 250	0	80	90
		125+ 125	0	60	75
	"	+ B1-7 1000+1000	0	90	90
		500+ 500	0	80	85
		250+ 250	0	75	75
		125+ 125	0	70	65

Ex. of Table 1, No. 20: 2-[2-chloro-4-(methylsulfonyl)benzoyl]-1,3-cyclohexanedione

Experimental conditions: Greenhouse experiment; stages of the plants: 4 leaves, or 2 whorls in the case of GAAP.

APSV = Apera spica venti = Windgrass

GAAP = Galium aparine = Catchweed bedstraw.

Table 7: Pot experiment under field conditions

Herbicide	Safener	Dosage rate [g AS/ha]	Wheat	Barley	Maize
Table 1,					
Ex. No. 47	-	1000	70	50	70
		500	50	30	60
		250	30	20	50
		125	20	10	30
"	+ B2-2	1000+1000	20	20	30
		500+ 250	5	10	10
		250+ 125	0	0	0
		125+ 620	0	0	0
"	+ B1-1	1000+ 500	10	20	10
		500+ 250	0	0	5
		250+ 125	0	0	0
		125+ 62	0	0	0
Table 1,					
Ex. No. 48		1000	90	80	95
		500	80	70	90
		250	70	60	80
		125	60	50	70
"	+ B2-1	1000+ 500	30	40	30
		500+ 250	10	20	5
		250+ 125	0	0	0
		125+ 62	0	0	0
"	+ B1-2	1000+ 500	20	30	40
		500+ 250	10	10	10
		250+ 125	0	0	0
		125+ 62	0	0	0

Experimental conditions: 13 cm pot under field conditions; stage of the cereals: beginning of tillering; stage of maize: 4 leaves; assessment: 4 weeks after treatment.

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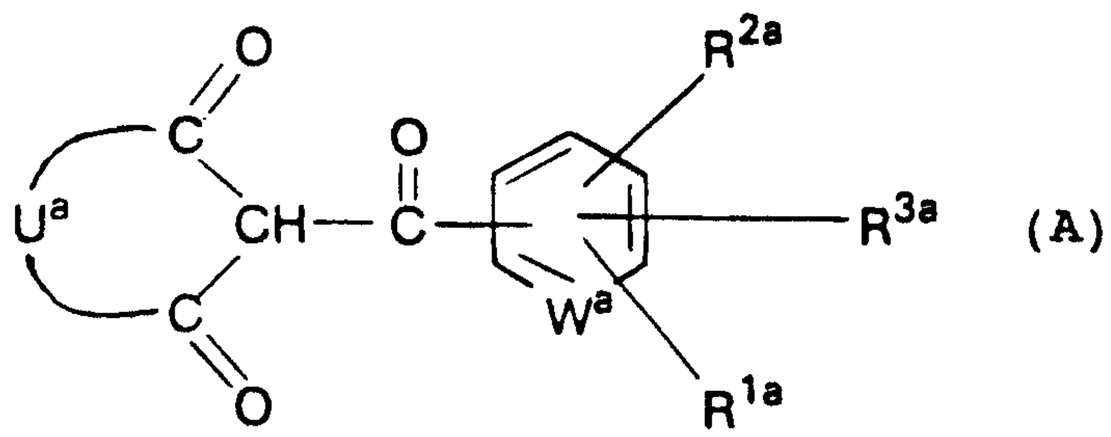
CLAIMS:

1. A herbicidal composition which comprises an active amount of

A) one or more herbicides selected from the group of the 2-acylated 1,3-dicarbonyl compounds of the formula A or salts thereof



(A)

in which

R^{1a} and R^{3a} independently of one another are hydrogen, halogen, alkyl, alkoxy, haloalkyl, haloalkoxy, CN, NO_2, $S(O)_mR^{11a}$, $NR^{12a}R^{13a}$, $NR^{14a}C(O)R^{15a}$, $C(O)R^{16a}$ or $OCH_2CH_2OR^{21a}$,

R^{2a} is halogen, CN, NO_2, alkyl, alkoxy, haloalkyl or haloalkoxy, $S(O)_pR^{10a}$, $-O-S(O)_2R^{10a}$, $N(R^{20a})-S(O)_2R^{19a}$,

W^a is nitrogen or CH,

R^{10a} is alkyl, haloalkyl or alkoxy,

R^{11a} is alkyl, haloalkyl, phenyl or benzyl, the last two radicals being unsubstituted or substituted on the phenyl ring, or is $NR^{17a}R^{18a}$,

R^{12a}, R^{13a} independently of one another are hydrogen or alkyl,

R^{14a} is hydrogen or alkyl,

R^{15a} is hydrogen or alkyl,

R^{16a} is hydrogen, alkyl, haloalkyl or alkoxy,

R^{17a} and R^{18a} independently of one another are hydrogen or alkyl,

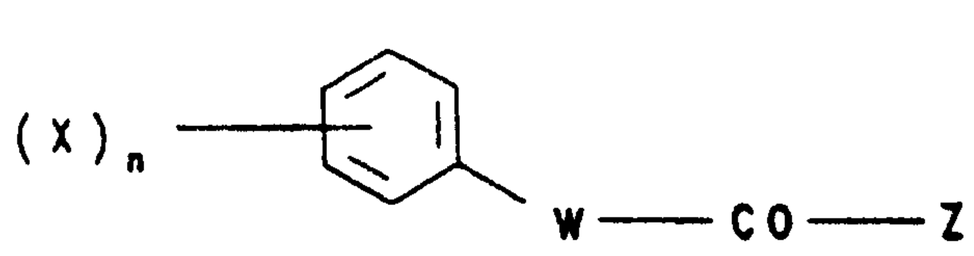
R^{19a} and R^{20a} independently of one another are alkyl or haloalkyl,

R^{21a} is hydrogen or alkyl,

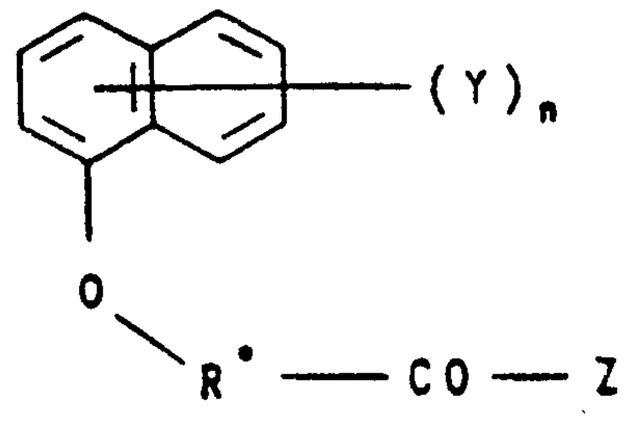
p is zero, one or two and

U^a and the group of the formula -CO-CH-CO- bonded to it together form a ring which has 5 to 6 ring members and which is carbocyclic or heterocyclic and, apart from the two oxo groups, not substituted or further substituted, and

B) one or more compounds of the formula B1 and B2,



(B1)



(B2)

in which

X is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro or C_1-C_4-haloalkyl,

Y is halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, nitro or C_1-C_4-haloalkyl,

R^* is a C_1-C_2-alkylene chain which can additionally be substituted by one or two C_1-C_4-alkyl radicals,

Z is OR^1, SR^1 or NR^1R,

R independently of R^1 is hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy or phenyl or substituted phenyl or

R and R^1 together with the nitrogen atom bonded to them are a saturated or unsaturated 3- to 7-membered heterocycle which has at least one nitrogen atom and up to 3 hetero atoms and which is unsubstituted or substituted by radicals selected from the group

comprising C_1-C_4-alkyl, C_1-C_4-alkoxy, phenyl or substituted phenyl,

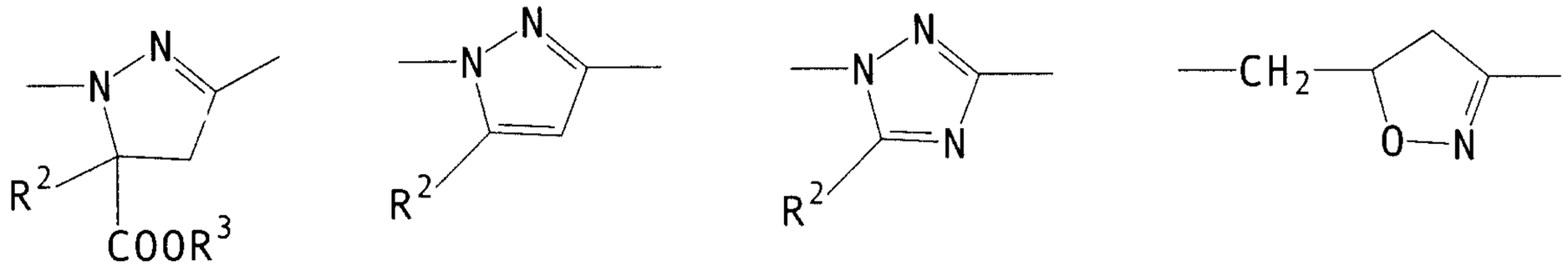
R^1 independently of R is hydrogen, C_1-C_{18}-alkyl, C_3-C_{12}-cycloalkyl, C_2-C_8-alkenyl or C_2-C_8-alkynyl,

where each of the above carbon-containing radicals independently of one another is unsubstituted or mono- or polysubstituted by radicals selected from the group comprising halogen, hydroxyl, C_1-C_8-alkoxy, C_1-C_8-alkylthio, C_2-C_8-alkenylthio, C_2-C_8-alkynylthio, C_2-C_8-alkenyloxy, C_2-C_8-alkynyloxy, C_3-C_7-cycloalkyl, C_3-C_7-cycloalkoxy, cyano, mono- and di-(C_1-C_4-alkyl)-amino, (C_1-C_8-alkoxy)-carbonyl, (C_2-C_8-alkenyloxy)-carbonyl, (C_1-C_8-alkylthio)-carbonyl, (C_2-C_8-alkynyloxy)-carbonyl, (C_1-C_8-alkyl)-carbonyl, (C_2-C_8-alkenyl)-carbonyl, (C_2-C_8-alkynyl)-carbonyl, 1-(hydroxyimino)-C_1-C_6-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_6-alkyl, 1-(C_1-C_4-alkoxyimino)-C_1-C_6-alkyl, (C_1-C_8-alkyl)-carbonylamino, (C_2-C_8-alkenyl)-carbonylamino, (C_2-C_8-alkynyl)-carbonylamino, aminocarbonyl, (C_1-C_8-alkyl)-aminocarbonyl, di-(C_1-C_6-alkyl)-aminocarbonyl, (C_2-C_6-alkenyl)-aminocarbonyl, (C_2-C_6-alkynyl)-aminocarbonyl, (C_1-C_8-alkoxy)-carbonylamino, (C_1-C_8-alkyl)-aminocarbonylamino, C_1-C_6-alkylcarbonyloxy, which is unsubstituted or substituted by halogen, NO_2, C_1-C_4-alkoxy or optionally substituted phenyl, furthermore comprising (C_2-C_6-alkenyl)-carbonyloxy, (C_2-C_6-alkynyl)-carbonyloxy, C_1-C_8-alkylsulfonyl, phenyl, phenyl-C_1-C_6-alkoxy, phenyl-(C_1-C_6-alkoxy)-carbonyl, phenoxy, phenoxy-C_1-C_6-alkoxy, phenoxy-(C_1-C_6-alkoxy)-carbonyl, phenylcarbonyloxy, phenylcarbonylamino, phenyl-(C_1-C_6-alkyl)-carbonylamino, the 9 last-mentioned radicals being unsubstituted or mono- or poly-substituted in the phenyl ring by radicals selected from halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy and nitro, and furthermore comprising radicals of the formulae $-SiR'_3$, $-OSiR'_3$, $(R')_3Si$-C_1-C_6-alkoxy, $-CO-O-NR'_2$, $-O-N=CR'_2$, $-N=CR'_2$, $-O-NR'_2$, $-CH(OR')_2$ and $-O-(CH_2)_m-CH(OR')_2$, in

which the R′ in the abovementioned formulae independently of one another are halogen, C_1-C_4-alkyl or phenyl which is unsubstituted or mono- or polysubstituted by radicals selected from halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy and nitro, or the R′, as a pair, are a C_2-C_6-alkylene chain and m is 0 to 6, and furthermore comprising an alkoxy radical of the formula R″O-CR″′(OR″)-C_1-C_6-alkoxy, in which the R″ independently of one another are C_1-C_4-alkyl or together are a C_1-C_6-alkylene group and R″′ is hydrogen or C_1-C_4-alkyl,

n is an integer from 1 to 5, and

W is a divalent heterocyclic radical having 5 ring atoms, of the formula W1 and W4,



(W1) (W2) (W3) (W4)

in which

R^2 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl, C_3-C_{12}-cycloalkyl or optionally substituted phenyl and

R^3 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl, (C_1-C_4-alkoxy)-C_1-C_4-alkyl, C_1-C_6-hydroxyalkyl, C_3-C_{12}-cycloalkyl or tri-(C_1-C_4-alkyl)-silyl.

2. A composition as claimed in claim 1, wherein R^* is $-CH_2-$.

3. A composition as claimed in claim 1 or 2, wherein Z is OR^1, NHR^1 or $N(CH_3)R^1$.

4. A composition as claimed in claim 3, wherein Z is OR^1.

5. A composition as claimed in any one of claims 1 to 4, wherein n is an integer from 1 to 3.

6. A composition as claimed in any one of claims 1 to 5, wherein

R^1 is hydrogen, C_1-C_{12}-alkyl, C_3-C_7-cycloalkyl, C_2-C_8-alkenyl or C_2-C_8-alkynyl,

where each of the abovementioned carbon-containing radicals independently of one another is unsubstituted or mono- or polysubstituted by halogen or mono- or disubstituted

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by radicals selected from the group comprising hydroxyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, C_2-C_4-alkenyloxy, C_2-C_4-alkynyloxy, mono and di-(C_1-C_2-alkyl)-amino, (C_1-C_4-alkoxy)-carbonyl, (C_2-C_4-alkenyloxy)-carbonyl, (C_2-C_4-alkynyloxy)-carbonyl, (C_1-C_4-alkyl)-carbonyl, (C_2-C_4-alkenyl)-carbonyl, (C_2-C_4-alkynyl)-carbonyl, 1-(hydroxyimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkoxyimino)-C_1-C_4-alkyl, C_1-C_4-alkylsulfonyl, phenyl, phenyl-C_1-C_4-alkoxy, phenyl-(C_1-C_4-alkoxy)-carbonyl, phenoxy, phenoxy-C_1-C_4-alkoxy, phenoxy-(C_1-C_4-alkoxy)-carbonyl, where the 6 last-mentioned radicals are unsubstituted or mono- or polysubstituted in the phenyl ring by radicals selected from the group comprising halogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, C_1-C_2-haloalkyl, C_1-C_2-haloalkoxy and nitro, and radicals of the formulae $-SiR'_3$, $-O-N=CR'_2$, $-N=CR'_2$ and $-O-NR'_2$, in which R' in the abovementioned formulae independently of one another are hydrogen, C_1-C_2-alkyl or phenyl which is unsubstituted or mono- or polysubstituted by radicals selected from the group comprising halogen, C_1-C_2-alkyl, C_1-C_2-alkoxy, C_1-C_2-haloalkyl, C_1-C_2-haloalkoxy and nitro, or, in pairs, are a C_4-C_5-alkylene chain.

7. A composition as claimed in claim 6, wherein R^1 is mono-substituted.

8. A composition as claimed in any one of claims 1 to 7, wherein, in the compounds of the formula B1 and B2,

X is hydrogen, halogen, methyl, ethyl, methoxy, ethoxy or C_1-C_2-haloalkyl

and

Y is halogen, methyl, ethyl, methoxy, ethoxy, or C_1-C_2-haloalkyl.

9. A composition as claimed in any one of claims 1 to 7, wherein, in the compounds of the formula B2,

Y is halogen or C_1-C_4-haloalkyl and n is a number from 1 to 3,

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Z is a radical of the formula OR^1,

R^* is CH_2 and

R^1 is hydrogen, C_1-C_8-alkyl, C_1-C_8-haloalkyl or (C_1-C_4-alkoxy)-C_1-C_4-alkyl, 1-(hydroxyimino)-C_1-C_4-alkyl, 1-(C_1-C_4-alkylimino)-C_1-C_3-alkyl, 1-(C_1-C_2-alkoxyimino)-C_1-C_3-alkyl.

10. A composition as claimed in any one of claims 1 to 9, wherein, in formula A,

R^{1a} and R^{3a} independently of one another are hydrogen, halogen, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_3)-haloalkoxy, CN, NO_2, $S(O)_mR^{11a}$, $NR^{12a}R^{13a}$, $NR^{14a}C(O)R^{15a}$, $C(O)R^{16a}$, $OCH_2CH_2OR^{21a}$,

R^{2a} is halogen, CN, NO_2, (C_1-C_4)-alkyl, (C_1-C_4)-alkoxy, (C_1-C_4)-haloalkyl, (C_1-C_4)-haloalkoxy, $S(O)_pR^{10a}$, $-O-S(O)_2R^{10a}$, $N(R^{20a})-S(O)_2R^{19a}$,

W^a is nitrogen or CH,

U^a is a divalent group of the formula $-X^a-(Ya)_n-Z^a-$,

X^a is $CR^{4a}R^{5a}$ or $N-R^{22a}$,

Y^a is $CR^{6a}R^{7a}$, carbonyl, oxygen, sulfur, $N-R^{23a}$ or $C=CH_2$,

Z^a is $CR^{8a}R^{9a}$, $N-R^{24a}$, oxygen or sulfur,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, halogen, hydroxyl, (C_1-C_4)-alkyl, (C_1-C_4)-alkylthio, [(C_1-C_4)-alkoxy]-carbonyl, (C_3-C_6)-cycloalkyl or phenyl, where the 5 last-mentioned hydrocarbon-containing radicals are unsubstituted or substituted by one or more halogen atoms,

R^{10a} is (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl or (C_1-C_4)-alkoxy,

R^{11a} is (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl, phenyl, substituted phenyl, benzyl or $NR^{17a}R^{18a}$,

R^{12a} and R^{13a} independently of one another are hydrogen or (C_1-C_4)-alkyl,

R^{14a} is (C_1-C_4)-alkyl or hydrogen,

R^{15a} is (C_1-C_4)-alkyl or hydrogen,

R^{16a} is hydrogen, (C_1-C_4)-alkyl, (C_1-C_4)-haloalkyl or (C_1-C_4)-alkoxy,

R^{17a} and R^{18a} independently of one another are hydrogen or (C_1-C_4)-alkyl,

R^{19a} and R^{20a} independently of one another are (C_1-C_4)-alkyl or (C_1-C_4)-haloalkyl,

R^{21a}, R^{22a}, R^{23a} and R^{24a} independently of one another are hydrogen or (C_1-C_4)-alkyl,

m and p independently of one another are zero or one, and

n is one.

11. A composition as claimed in one of claims 1 to 9, wherein, in formula A

R^{1a} and R^{3a} independently of one another are hydrogen, fluorine, chlorine, bromine, iodine, cyano, nitro, * $-SO_3R^{11a}$, $NR^{12a}R^{13a}$, $-N(CH_3)-C(O)R^{15a}$, $[(C_1-C_4)$-alkoxy]-carbonyl, (C_1-C_2)-alkyl, (C_1-C_2)-alkoxy, $OCH_2-CH_2-OR^{21a}$, (C_1-C_2)-haloalkyl, (C_1-C_2)-haloalkoxy or (C_1-C_2)-alkylthio,

R^{2a} is fluorine, chlorine, bromine, iodine, cyano, nitro, $S(O)_pR^{10a}$, (C_1-C_3)-alkyl, (C_1-C_2)-alkoxy, (C_1-C_3)-haloalkyl or (C_1-C_2)-haloalkoxy,

U^a is a divalent group of the formula $-X^a-(Ya)_n-Z^a-$,

W^a is nitrogen or CH,

X^a is $CR^{4a}R^{5a}$ or $N-R^{22a}$

Y^a is $CR^{6a}R^{7a}$, carbonyl, oxygen, sulfur, $N-R^{23a}$ or $C=CH_2$,

Z^a is $CR^{8a}R^{9a}$, $N-R^{24a}$, oxygen or sulfur,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, fluorine, chlorine, bromine, hydroxyl, (C_1-C_3)-alkyl, (C_4-C_6)-cycloalkyl, (C_1-C_2)-alkylthio and phenyl, the 4 last-mentioned hydrocarbon-containing radicals being unsubstituted or substituted by one or more halogen atoms, and

R^{21a}, R^{22a}, R^{23a} and R^{24a} independently of one another are (C_1-C_4)-alkyl.

12. A composition as claimed in one of claims 1 to 9, wherein, in formula A,

R^{1a} and R^{3a} independently of one another are hydrogen, fluorine, chlorine, bromine, methoxy, ethoxy, methyl, trifluoromethoxy, difluoromethoxy, $OCH_2CH_2OCH_3$, nitro, trifluoromethyl, methylthio, $-SO_2CH_3$, $SO_2CH_2CH_3$, $SO_2CH_2CH_2CH_3$, SO_2CH_2Cl, $-N(CH_3)_2$,

OCH_2CH_2Cl, OCH_2CF_3, $SO_2N(CH_3)_2$, ethyl, n-propyl or [$(C_1$-$C_4)$-alkoxy]-carbonyl,

R^{2a} is fluorine, chlorine, bromine, iodine, cyano, nitro, $S(O)_pR^{10a}$, $(C_1$-$C_3)$-alkyl, $(C_1$-$C_2)$-alkoxy, $(C_1$-$C_3)$-haloalkyl or $(C_1$-$C_2)$-haloalkoxy,

R^{4a}, R^{5a}, R^{6a}, R^{7a}, R^{8a} and R^{9a} independently of one another are hydrogen, methyl, ethyl, propyl, isopropyl, cyclopentyl, hydroxyl, methylthio, fluorine, chlorine, bromine and phenyl which is optionally substituted by one or more halogen atoms, and

p is two.

13. A composition as claimed in one of claims 1 to 12, wherein the ratio by weight of safener B to herbicide A is from 1:10 to 10:1.

14. A composition as claimed in one of claims 1 to 9, which comprises 0.1 to 99 percent by weight of active substances A and B and 1 to 99% by weight of a solid or liquid additive and 0 to 25% by weight of a surfactant.

15. A process for protecting crop plants against phytotoxic secondary effects of herbicides, which comprises applying an effective amount of one or more compounds B (safener) of the type B defined in any one of claims 1 to 12, before, after or simultaneously with the herbicide A as defined in any one of claims 1 to 12, to the plants, seeds of the plants or the area under cultivation.

16. The process as claimed in claim 15, wherein the safener B is applied at an application rate of 0.001 to 5 kg/ha of active substance and at a ratio by weight of safener:herbicide of 1:10 to 10:1.

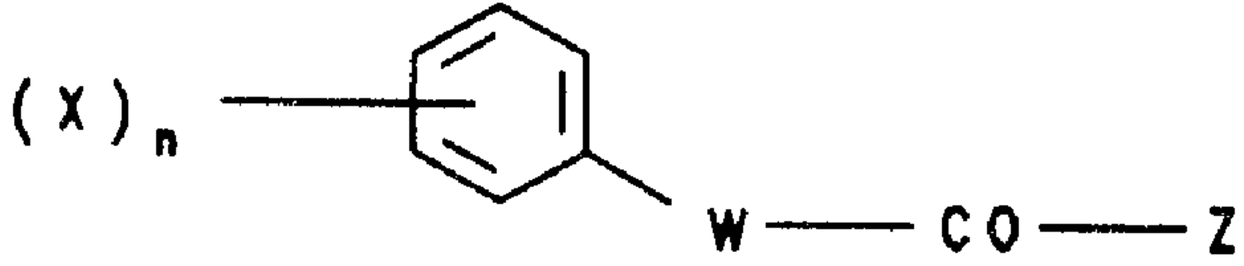
17. The process as claimed in claim 15 or 16, wherein the crop plants are cereal plants, maize plants or rice plants.

18. The use of compounds B as claimed in any one of claims 1 to 12, for protecting crop plants against phytotoxic effects of the herbicidal compounds of the formula A or salts thereof, as they are defined in any one of claims 1 to 12.

FETHERSTONHAUGH & CO.

PATENT AGENTS

OTTAWA, CANADA



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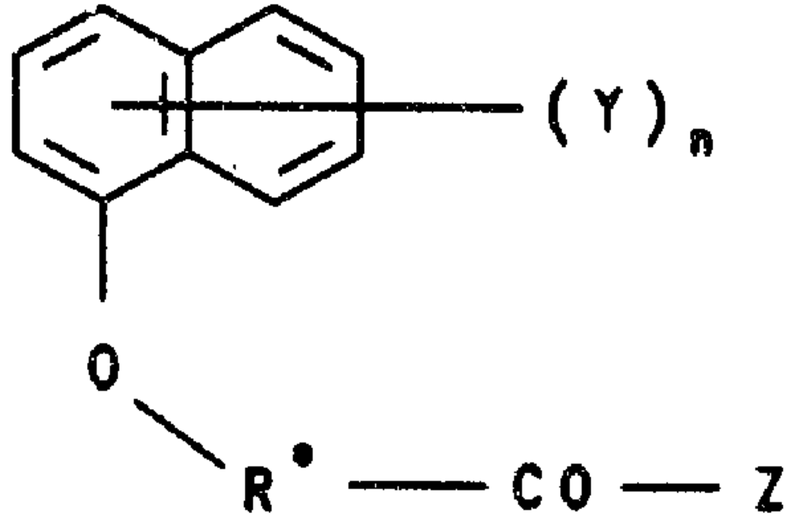

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