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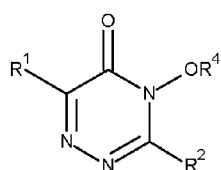
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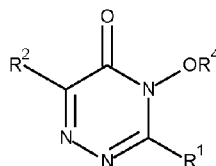
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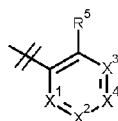
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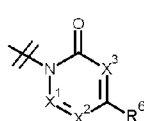
(I)



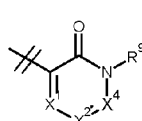
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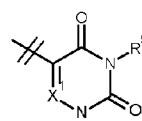
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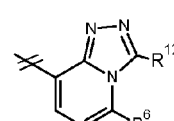
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(A3)



(A4)



(A5)

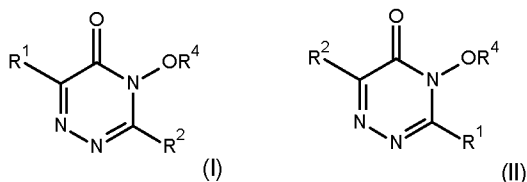
(57) Abstract: The present invention provides a compound of Formula (I) or Formula (II): or an agronomically acceptable salt thereof, wherein :- R² is selected from the group consisting of A1, A2, A3, A4 and A5 wherein X¹ is N or CR⁷; X² is N or CR⁸; X³ is N or CR⁹; X⁴ is N or CR⁶; R¹, R⁴, R⁵, R⁶, R⁷, R⁸, R⁹, R¹² and R¹⁴ are as defined herein. The invention further relates to herbicidal compositions which comprise a compound of Formula (I) or Formula (II), and to their use for controlling weeds, in particular in crops of useful plants.

HERBICIDAL COMPOUNDS

The present invention relates to novel herbicidal triazinones, to processes for their preparation, to herbicidal compositions which comprise the novel compounds, and to their use for controlling weeds, in particular in crops of useful plants.

Herbicidal triazinones are known, for example, from WO 94/03454 and WO00/08000. The present invention provides improved herbicidal triazinones, which are characterised as having, for example, a N-hydroxy substituent.

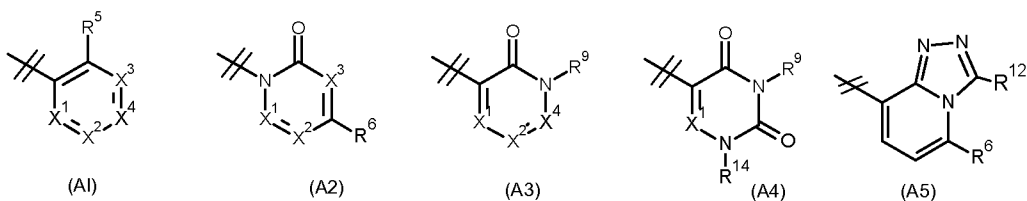
Thus, according to the present invention there is provided a compound of Formula (I) or Formula (II):



or an agronomically acceptable salt thereof,
wherein:-

R¹ is selected from the group consisting of hydrogen, C₁-C₆alkyl, C₃-C₆cycloalkyl, C₂-C₆alkenyl, C₂-C₆alkynyl, C₁-C₆haloalkyl, C₁-C₆alkoxy-C₁-C₃-alkyl and C₃-C₆cycloalkyl-C₁-C₃-alkyl;

R² is selected from the group consisting of A1, A2, A3, A4 and A5



wherein

X^1 is N or CR⁷;

X^2 is N or CR⁸;

5 X^3 is N or CR⁹;

X^4 is N or CR⁶;

10 R^4 is selected from the group consisting of hydrogen, C₁-C₆alkyl, C₁-C₆cycloalkyl, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₁-C₆alkylcarbonyl-, aryl, arylcarbonyl-, C₁-C₆alkoxycarbonyl-, C₁-C₆alkoxycarbonyl-oxy-C₁-C₆alkyl-, C₁-C₆alkyl-S(O)_p-, C₁-C₆alkyl-S(O)_pcarbonyl- and aryl-S(O)_p-, wherein said aryl groups may be optionally substituted by one or more R¹¹;

15 R^5 is selected from the group consisting of hydroxyl, halogen, C₁-C₆alkyl, C₁-C₆cycloalkyl, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₁-C₆alkoxy-, C₂-C₆alkenyloxy-, C₃-C₆cycloalkylC₁-C₃-alkyl-, C₁-C₆alkoxyC₁-C₃alkyl-, C₁-C₆alkoxy-C₂-C₆alkoxy-, C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl-, C₁-C₆haloalkoxy-, C₁-C₆haloalkoxy-C₁-C₃alkyl-, C₁-C₆alkyl-S(O)_p-, C₁-C₆haloalkyl-S(O)_p-, aryl, aryl-S(O)_p-, heterocyclyl, heterocyclyl-S(O)_p-, aryloxy-, aryl-C₂-C₆alkyl-, aryl-C₁-C₆alkoxy-, heterocyclyloxy-, heterocyclyl-C₁-C₃alkoxy-C₁-C₃alkyl-, hydroxycarbonyl, hydroxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkoxycarbonyl-, C₁-C₃alkoxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkylamino-, C₁-C₃dialkylamino-, C₁-C₃alkylamino-S(O)_p-, C₁-C₃alkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃dialkylamino-S(O)_p-, C₁-C₃dialkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃alkylaminocarbonyl-, C₁-C₃alkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃dialkylaminocarbonyl-, C₁-C₃dialkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃alkylcarbonylamino-, C₁-C₃alkyl-S(O)_p-amino-, C₁-C₃alkyl-S(O)_p-C₁-C₃alkylamino-, C₁-C₃alkyl-S(O)_p-aminoC₁-C₃alkyl-, cyano and nitro, wherein said heterocyclyls are five or six membered heterocyclyls containing from one to three heteroatoms each independently selected from the group consisting of oxygen, nitrogen and

sulphur, and wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₆alkyl-S(O)_p-, phenyl, cyano and nitro;

5

R⁶ and R⁹ are independently selected from the group consisting of hydrogen, hydroxyl, halogen, C₁-C₆alkyl, C₁-C₆cycloalkyl, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₁-C₆alkoxy-, C₂-C₆alkenyloxy-, C₃-C₆cycloalkylC₁-C₃-alkyl-, C₁-C₆alkoxyC₁-C₃alkyl-, C₁-C₆alkoxy-C₂-C₆alkoxy-, C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl-, C₁-C₆haloalkoxy-, C₁-C₆haloalkoxy-C₁-C₃alkyl-, C₁-C₆alkyl-S(O)_p-, C₁-C₆haloalkyl-S(O)_p-, aryl, aryl-S(O)_p-, heterocyclyl, heterocyclyl-S(O)_p-, aryloxy-, aryl-C₂-C₆alkyl-, aryl-C₁-C₆alkoxy-, heterocyclyloxy-, heterocyclyl-C₁-C₃alkoxy-C₁-C₃alkyl-, hydroxycarbonyl, hydroxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkoxycarbonyl-, C₁-C₃alkoxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkylamino-, C₁-C₃dialkylamino-, C₁-C₃alkylamino-S(O)_p-, C₁-C₃alkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃dialkylamino-S(O)_p-, C₁-C₃dialkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃alkylaminocarbonyl-, C₁-C₃alkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃dialkylaminocarbonyl-, C₁-C₃dialkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃alkylcarbonylamino-, C₁-C₃alkyl-S(O)_p-amino-, C₁-C₃alkyl-S(O)_p-C₁-C₃alkylamino-, C₁-C₃alkyl-S(O)_p-aminoC₁-C₃alkyl-, cyano and nitro, wherein said heterocyclyls are five or six membered heterocyclyls containing from one to three heteroatoms each independently selected from the group consisting of oxygen, nitrogen and sulphur, and wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₆alkyl-S(O)_p-, phenyl, cyano and nitro;

25

R⁷ and R⁸ are independently selected from the group consisting of hydrogen, halogen, C₁-C₃alkyl-, C₁-C₃alkoxy-, C₂-C₃alkenyl-, C₂-C₃alkynyl-, C₁-C₃haloalkyl- and C₁-C₃haloalkoxy-;

30

and wherein R⁵ and R⁹ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more nitrogen and/or oxygen heteroatoms, the 5- or 6-membered ring being optionally substituted by one or more R¹²; or

5

R⁶ and R⁹ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more heteroatoms selected from the group consisting of nitrogen, oxygen and S(O)₂, the 5- or 6-membered ring being optionally substituted by one or more R¹²; or

10

R⁶ and R⁸ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more nitrogen heteroatoms, the 5- or 6-membered ring being optionally substituted by one or more R¹³; and

15

R¹¹ is selected from the group consisting of halo-, C₁-C₃alkyl, C₁-C₃ haloalkyl and C₁-C₆alkoxy;

20

R¹² is selected from the group of hydrogen, cyano, halo-, oxy-, C₁-C₃alkylS(O)_p-, C₁-C₃ alkyl, C₃-C₆cycloalkyl-, C₂-C₃alkenyl, C₂-C₃alkynyl, C₁-C₃ alkoxy and C₁-C₃ haloalkyl;

25

R¹³ is selected from the group of hydrogen, cyano, halo-, C₁-C₃alkylS(O)_p-, C₁-C₃ alkyl, C₂-C₃alkenyl, C₂-C₃alkynyl, morpholinyl- and C₁-C₃ haloalkyl;

30

R¹⁴ is selected from the group consisting of hydrogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy-C₁-C₆alkyl, C₁-C₆haloalkoxy-C₁-C₆alkyl, C₁-C₆alkoxy-C₁-C₆alkoxy-C₁-C₆alkyl, C₁-C₆alkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₂-C₆haloalkynyl and C₃-C₆ cycloalkyl;

and

p = 0, 1 or 2

with the exception of compounds of Formula (II) wherein $R^2 = (A1)$, $R^4 =$ hydrogen, $R^5 =$ halogen, $X^1 = CH$, $X^2 = CH$, $X^3 = CH$ and $X^4 = -C-CN$.

Alkyl groups having a chain length of from 1 to 6 carbon atoms include, for example, methyl (Me, CH_3), ethyl (Et, C_2H_5), *n*-propyl (*n*-Pr), isopropyl (*i*-Pr), *n*-butyl (*n*-Bu), isobutyl (*i*-Bu), *sec*-butyl and *tert*-butyl (*t*-Bu).

Alkenyl groups having a chain length of from 2 to 6 carbon atoms include, for example, $-CH=CH_2$ (vinyl) and $-CH_2-CH=CH_2$ (allyl).

Alkynyl groups having a chain length of from 2 to 6 carbon atoms include, for example, $-C\equiv CH$ (ethynyl) and $-CH_2-C\equiv CH$ (propargyl).

Cycloalkyl groups include *c*-propyl (*c*-Pr), *c*-butyl (*c*-Bu), *c*-pentyl and *c*-hexyl.

Halogen (halo) encompasses fluorine, chlorine, bromine or iodine. The same correspondingly applies to halogen in the context of other definitions, such as haloalkyl or halophenyl.

Haloalkyl groups having a chain length of from 1 to 6 carbon atoms are, for example, fluoromethyl, difluoromethyl, trifluoromethyl, chloromethyl, dichloromethyl, trichloromethyl, 2,2,2-trifluoroethyl, 2-fluoroethyl, 2-chloroethyl, pentafluoroethyl, 1,1-difluoro-2,2,2-trichloroethyl, 2,2,3,3-tetrafluoroethyl and 2,2,2-trichloroethyl, heptafluoro-*n*-propyl and perfluoro-*n*-hexyl.

Haloalkenyl radicals include alkenyl groups substituted one or more times by halogen, halogen being fluorine, chlorine, bromine or iodine and especially fluorine or chlorine, for example 2,2-difluoro-1-methylvinyl, 3-fluoropropenyl, 3-chloropropenyl, 3-bromopropenyl, 2,3,3-trifluoropropenyl, 2,3,3-trichloropropenyl and 4,4,4-trifluorobut-2-en-1-yl. Preferred C_2-C_6 alkenyl radicals substituted once, twice or three times by halogen are those having a chain length of from 2 to 5 carbon atoms.

Alkoxy groups preferably have a chain length of from 1 to 6 carbon atoms. Alkoxy is, for example, methoxy, ethoxy, propoxy, isopropoxy, n-butoxy, isobutoxy, sec-butoxy or tert-butoxy or a pentyloxy or hexyloxy isomer, preferably methoxy and ethoxy. Alkylcarbonyl is preferably acetyl or propionyl. Alkoxy carbonyl is, for example, methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl, isopropoxycarbonyl, n-butoxycarbonyl, isobutoxycarbonyl, sec-butoxycarbonyl or tert-butoxycarbonyl, preferably methoxycarbonyl, ethoxycarbonyl or tert-butoxycarbonyl. It should also be appreciated that two alkoxy substituents present on the same carbon atom may be joined to form a spiro group. Thus, the methyl groups present in two methoxy substituents may be joined to form a spiro 1,3 dioxolane substituent, for example. Such a possibility is within the scope of the present invention.

Haloalkoxy is, for example, fluoromethoxy, difluoromethoxy, trifluoromethoxy, 2,2,2-trifluoroethoxy, 1,1,2,2-tetrafluoroethoxy, 2-fluoroethoxy, 2-chloroethoxy, 2,2-difluoroethoxy or 2,2,2-trichloroethoxy, preferably difluoromethoxy, 2-chloroethoxy or trifluoromethoxy.

Alkylthio (alkyl-S-) groups preferably have a chain length of from 1 to 6 carbon atoms. Alkylthio is, for example, methylthio, ethylthio, propylthio, isopropylthio, n-butylthio, isobutylthio, sec-butylthio or tert-butylthio, preferably methylthio or ethylthio.

Alkylsulfinyl (alkyl-SO-) is, for example, methylsulfinyl, ethylsulfinyl, propylsulfinyl, isopropylsulfinyl, n-butylsulfinyl, isobutylsulfinyl, sec-butylsulfinyl or tert-butylsulfinyl, preferably methylsulfinyl or ethylsulfinyl.

Alkylsulfonyl (alkyl-S(O)₂-) is, for example, methylsulfonyl, ethylsulfonyl, propylsulfonyl, isopropylsulfonyl, n-butylsulfonyl, isobutylsulfonyl, sec-butylsulfonyl or tert-butylsulfonyl, preferably methylsulfonyl or ethylsulfonyl.

30

Alkylamino (alkyl-NH-) is, for example, methylamino, ethylamino, n-propylamino, isopropylamino or a butylamino isomer. Dialkylamino ((alkyl)₂-N-) is, for example, dimethylamino, methylethylamino, diethylamino, n-propylmethylamino,

dibutylamino or diisopropylamino. Preference is given to alkylamino groups having a chain length of from 1 to 4 carbon atoms.

5 Cycloalkylamino- or dicycloalkylamino- is for example cyclohexylamino or dicyclopropylamino.

Alkoxyalkyl groups preferably have from 1 to 6 carbon atoms. Alkoxyalkyl is, for example, methoxymethyl, methoxyethyl, ethoxymethyl, ethoxyethyl, n-propoxymethyl, n-propoxyethyl, isopropoxymethyl or isopropoxyethyl.

10

Alkylthioalkyl (alkyl-S-alkyl) groups preferably have from 1 to 6 carbon atoms. Alkylthioalkyl is, for example, methylthiomethyl, methylthioethyl, ethylthiomethyl, ethylthioethyl, n-propylthiomethyl, n-propylthioethyl, isopropylthiomethyl, isopropylthioethyl, butylthiomethyl, butylthioethyl or butylthiobutyl.

15

Cycloalkyl groups preferably have from 3 to 6 ring carbon atoms and may be substituted by one or more methyl groups; they are preferably unsubstituted, for example cyclopropyl (*c*-Pr), cyclobutyl (*c*-Bu), cyclopentyl (*c*-pentyl) or cyclohexyl (*c*-hexyl).

20

Aryl includes benzyl, phenyl, including phenyl as part of a substituent such as phenoxy, benzyl, benzyloxy, benzoyl, phenylthio, phenylalkyl, phenoxyalkyl or tosyl, may be in mono- or poly-substituted form, in which case the substituents may, as desired, be in the ortho-, meta- and/or para-position(s). The term also includes, for example, naphthalenyl.

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Heterocyclyl, includes, for example, morpholinyl, tetrahydrofuryl, isoxazolinyl, and heteroaryl.

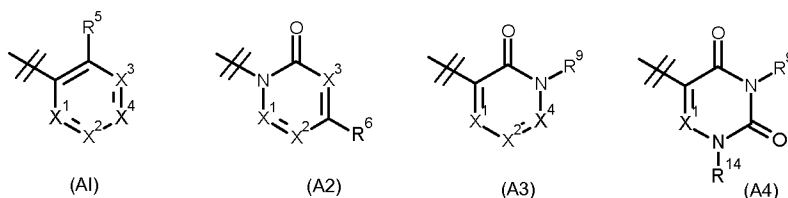
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Heteroaryl, including heteroaryl as part of a substituent such as heteroaryloxy, means, for example, a five to ten (preferably five or six) member heteroaryl containing one to three heteroatoms, each independently selected from the group

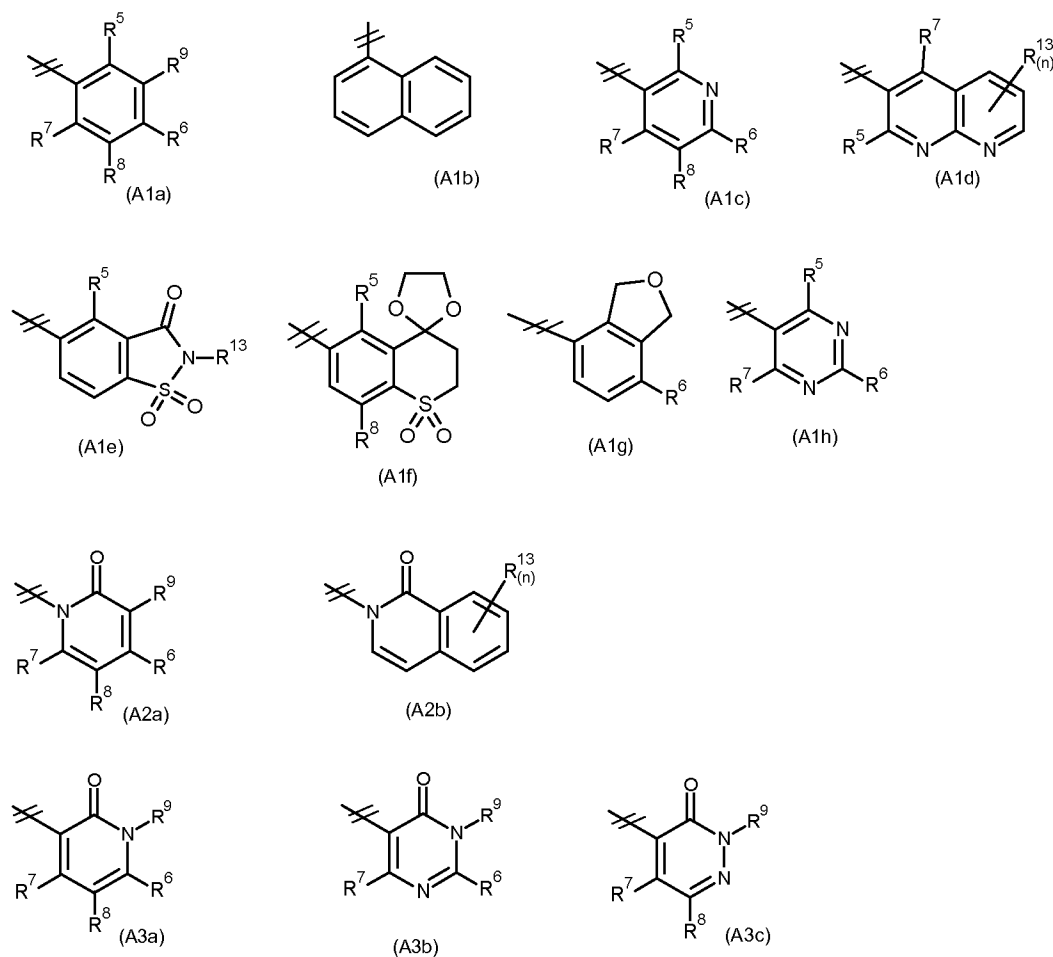
consisting of oxygen, nitrogen and sulphur. The term heteroaryl thus includes, for example, benzofuranyl, benzimidazolyl, indolyl, isobenzofuranyl, furanyl, thiophenyl, thiazolyl, oxazolyl, isoxazolyl, thiazolyl, pyrazolyl, isothiazolyl, pyridyl, pyridazinyl, pyrazinyl, pyrimidinyl, pyridonyl, triazolyl, naphthyridinyl and naphthyridinonyl. The heteroaryl component may be optionally mono or poly substituted as previously defined.

Preferably, R^1 is selected from the group consisting of C_1 - C_4 alkyl (especially methyl or *iso*-propyl), cyclopropyl, methoxymethyl, trifluoromethyl, cyclopropylmethyl-, vinyl and propargyl with methyl being particularly preferred.

Preferably, R^2 is selected from the group consisting of A1, A2, A3 and A4.



More preferably R^2 is selected from the group consisting of A1a, A1b, A1c, A1d, A1e, A1f, A1g, A1h, A2a, A2b, A3a, A3b and A3c:



wherein R^5 , R^6 , R^7 , R^8 , R^9 , R^{12} and R^{13} are as defined previously and n is 0, 1,

2 or 3.

More preferably, R^2 is selected from the group consisting of phenyl (e.g. A1a), 3-pyridyl (e.g. A1c), N-pyridonyl (e.g. A2a) and 3-linked [1,8]naphthyridinyl (e.g. A1d). Even more preferably R^2 is phenyl (e.g. A1a).

R^4 is preferably selected from the group consisting of hydrogen, C_1 - C_6 alkylcarbonyl-, arylcarbonyl-, C_1 - C_6 alkoxycarbonyl-, C_1 - C_6 alkyl-S(O)_p-, C_1 - C_6 alkyl-S(O)_pcarbonyl- and aryl-S(O)_p-, wherein said aryl groups may be optionally substituted by one or more R^{11} ;

R^4 is more preferably H.

R⁵ is preferably selected from the group consisting of hydroxyl, halo, C₁-C₆alkyl, C₁-C₆cycloalkyl, C₁-C₆haloalkyl, C₁-C₆alkenyl, C₁-C₆alkynyl, C₁-C₆alkoxy, C₁-C₆alkoxyC₁-C₃alkyl, C₁-C₆alkoxy-C₂-C₆alkoxy, C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl, C₁-C₆haloalkoxy, C₁-C₆haloalkoxy-C₁-C₃alkyl, C₁-C₆alkyl-S(O)_p-, C₁-C₆haloalkyl-S(O)_p-, aryl, aryloxy, heterocyclyl, heterocyclyl-C₁-C₃alkoxy-C₁-C₃alkyl, C₁-C₃alkylamino-, C₁-C₃dialkylamino-, C₁-C₃alkylamino-S(O)_p-, C₁-C₃alkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃dialkylamino-S(O)_p-, C₁-C₃dialkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃alkylaminocarbonyl-, C₁-C₃dialkylaminocarbonyl-, C₁-C₃dialkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃alkylcarbonylamino-, C₁-C₃alkyl-S(O)_p-amino-, cyano and nitro, wherein said heterocyclyls are five or six membered heterocyclyls containing from one to three heteroatoms each independently selected from the group consisting of oxygen, nitrogen and sulphur, and wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, cyano and nitro.

The terms “aryl” and “heterocyclyl” are further defined above. However, in the context of R⁵ phenyl, benzyl, isoxazoliny (e.g 4,5-dihydro-1,2-oxazol-3-yl), pyrimidinyl, morpholinyl, furyl and thiophenyl are particularly preferred.

More preferably, R⁵ is selected from the group consisting of chloro, fluoro, bromo, methyl, trifluoromethyl, 2-fluoroethyl-, methoxymethyl, methoxyethoxymethyl-, trifluoromethoxymethyl-, methylS(O)_p-, aryl, isoxazoliny, morpholinyl, methyl-S(O)_p-dimethylamino-, cyano and nitro, wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of chloro, methyl and trifluoromethyl.

More preferably, R⁵ is selected from the group consisting of halogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxyC₁-C₃alkyl, C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl, C₁-C₆alkyl-S(O)_p- and nitro.

Even more preferably, R⁵ is selected from the group consisting of chloro, fluoro, bromo, methyl, methoxymethyl-, methoxyethoxymethyl-, methylS(O)_p- and nitro.

5 Preferably, R⁶ is selected from the group consisting of hydrogen, halogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkyl-S(O)_p-, C₁-C₆cycloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₁-C₆alkoxy-, C₁-C₆haloalkoxy, C₂-C₆alkenyloxy-, C₃-C₆cycloalkylC₁-C₃-alkyl-, C₁-C₆alkoxyC₁-C₃alkyl-, C₁-C₆alkoxy-C₂-C₆alkoxy-, nitro and phenyl wherein the phenyl may be optionally substituted by one or more
 10 substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₆alkyl-S(O)_p-, phenyl, cyano and nitro. More preferably, R⁶ is selected from the group consisting of hydrogen, halogen (especially chlorine), C₁-C₆alkyl (especially methyl), C₁-C₆haloalkyl (e.g. trifluoromethyl-), C₁-C₆alkyl-S(O)_p- (e.g. -S(O)₂Me), C₂-C₆alkenyl, C₂-C₆alkynyl and cyano.

15 Preferably, R⁷ is selected from the group consisting of hydrogen, halogen and C₁-C₃alkyl-, most preferably hydrogen.

Preferably, R⁸ is selected from the group consisting of hydrogen, halogen and
 20 C₁-C₃alkyl-, most preferably hydrogen.

Preferably, R⁹ is selected from the group consisting of hydrogen, halogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkyl-S(O)_p-, C₁-C₆cycloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₁-C₆alkoxy-, C₁-C₆haloalkoxy, C₁-C₆haloalkoxy-C₁-C₃alkyl-, C₂-C₆alkenyloxy-, C₃-C₆cycloalkylC₁-C₃-alkyl-, C₁-C₆alkoxyC₁-C₃alkyl-, C₁-C₆alkoxy-C₂-C₆alkoxy-, nitro, isoxazoliny, and phenyl wherein the phenyl may be optionally substituted by one or more substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₆alkyl-S(O)_p-, phenyl, cyano and nitro.
 25

30 More preferably, R⁹ is selected from the group consisting of hydrogen, isoxazoliny, C₁-C₆haloalkoxy-C₁-C₃alkyl- (e.g. 2,2,2trifluoroethyloxymethyl-) and C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl- (e.g. methoxyethoxymethyl-).

Preferably, R¹⁴ is selected from the group consisting of hydrogen, methyl and halogen.

5 Compounds of Formula I or II may contain asymmetric centres and may be present as a single enantiomer, pairs of enantiomers in any proportion or, where more than one asymmetric centre are present, contain diastereoisomers in all possible ratios. Typically one of the enantiomers has enhanced biological activity compared to the other possibilities.

10

Similarly, where there are disubstituted alkenes, these may be present in E or Z form or as mixtures of both in any proportion.

15 Furthermore, compounds of Formula I or II may be in equilibrium with alternative hydroxyl tautomeric forms. It should be appreciated that all tautomeric forms (single tautomer or mixtures thereof), racemic mixtures and single isomers are included within the scope of the present invention.

20 The present invention also includes agronomically acceptable salts that the compounds of Formula I may form with amines (for example ammonia, dimethylamine and triethylamine), alkali metal and alkaline earth metal bases or quaternary ammonium bases. Among the alkali metal and alkaline earth metal hydroxides, oxides, alkoxides and hydrogen carbonates and carbonates used as salt formers, emphasis is to be given to the hydroxides, alkoxides, oxides and carbonates
25 of lithium, sodium, potassium, magnesium and calcium, but especially those of sodium, magnesium and calcium. The corresponding trimethylsulfonium salt may also be used.

30 The compounds of Formula (I) or (II) according to the invention can be used as herbicides by themselves, but they are generally formulated into herbicidal compositions using formulation adjuvants, such as carriers, solvents and surface-active agents (SFAs). Thus, the present invention further provides a herbicidal composition comprising a herbicidal compound according to any one of the previous

claims and an agriculturally acceptable formulation adjuvant. The composition can be in the form of concentrates which are diluted prior to use, although ready-to-use compositions can also be made. The final dilution is usually made with water, but can be made instead of, or in addition to, water, with, for example, liquid fertilisers,
5 micronutrients, biological organisms, oil or solvents.

The herbicidal compositions generally comprise from 0.1 to 99 % by weight, especially from 0.1 to 95 % by weight, compounds of Formula I and from 1 to 99.9 % by weight of a formulation adjuvant which preferably includes from 0 to 25 % by
10 weight of a surface-active substance.

The compositions can be chosen from a number of formulation types, many of which are known from the Manual on Development and Use of FAO Specifications for Plant Protection Products, 5th Edition, 1999. These include dustable powders
15 (DP), soluble powders (SP), water soluble granules (SG), water dispersible granules (WG), wettable powders (WP), granules (GR) (slow or fast release), soluble concentrates (SL), oil miscible liquids (OL), ultra low volume liquids (UL), emulsifiable concentrates (EC), dispersible concentrates (DC), emulsions (both oil in water (EW) and water in oil (EO)), micro-emulsions (ME), suspension concentrates
20 (SC), aerosols, capsule suspensions (CS) and seed treatment formulations. The formulation type chosen in any instance will depend upon the particular purpose envisaged and the physical, chemical and biological properties of the compound of Formula (I).

Dustable powders (DP) may be prepared by mixing a compound of Formula (I)
25 or (II) with one or more solid diluents (for example natural clays, kaolin, pyrophyllite, bentonite, alumina, montmorillonite, kieselguhr, chalk, diatomaceous earths, calcium phosphates, calcium and magnesium carbonates, sulphur, lime, flours, talc and other organic and inorganic solid carriers) and mechanically grinding the mixture to a fine powder.

30 Soluble powders (SP) may be prepared by mixing a compound of Formula (I) or (II) with one or more water-soluble inorganic salts (such as sodium bicarbonate, sodium carbonate or magnesium sulphate) or one or more water-soluble organic solids

(such as a polysaccharide) and, optionally, one or more wetting agents, one or more dispersing agents or a mixture of said agents to improve water dispersibility/solubility. The mixture is then ground to a fine powder. Similar compositions may also be granulated to form water soluble granules (SG).

5 Wettable powders (WP) may be prepared by mixing a compound of Formula (I) or (II) with one or more solid diluents or carriers, one or more wetting agents and, preferably, one or more dispersing agents and, optionally, one or more suspending agents to facilitate the dispersion in liquids. The mixture is then ground to a fine powder. Similar compositions may also be granulated to form water dispersible
10 granules (WG).

 Granules (GR) may be formed either by granulating a mixture of a compound of Formula (I) or (II) and one or more powdered solid diluents or carriers, or from pre-formed blank granules by absorbing a compound of Formula (I) (or a solution thereof, in a suitable agent) in a porous granular material (such as pumice, attapulgite
15 clays, fuller's earth, kieselguhr, diatomaceous earths or ground corn cobs) or by adsorbing a compound of Formula (I) or (II) (or a solution thereof, in a suitable agent) on to a hard core material (such as sands, silicates, mineral carbonates, sulphates or phosphates) and drying if necessary. Agents which are commonly used to aid absorption or adsorption include solvents (such as aliphatic and aromatic petroleum
20 solvents, alcohols, ethers, ketones and esters) and sticking agents (such as polyvinyl acetates, polyvinyl alcohols, dextrans, sugars and vegetable oils). One or more other additives may also be included in granules (for example an emulsifying agent, wetting agent or dispersing agent).

 Dispersible Concentrates (DC) may be prepared by dissolving a compound of
25 Formula (I) in water or an organic solvent, such as a ketone, alcohol or glycol ether. These solutions may contain a surface active agent (for example to improve water dilution or prevent crystallisation in a spray tank).

 Emulsifiable concentrates (EC) or oil-in-water emulsions (EW) may be prepared by dissolving a compound of Formula (I) in an organic solvent (optionally
30 containing one or more wetting agents, one or more emulsifying agents or a mixture of said agents). Suitable organic solvents for use in ECs include aromatic

hydrocarbons (such as alkylbenzenes or alkylnaphthalenes, exemplified by SOLVESSO 100, SOLVESSO 150 and SOLVESSO 200; SOLVESSO is a Registered Trade Mark), ketones (such as cyclohexanone or methylcyclohexanone) and alcohols (such as benzyl alcohol, furfuryl alcohol or butanol), N-alkylpyrrolidones (such as N-methylpyrrolidone or N-octylpyrrolidone), dimethyl amides of fatty acids (such as C₈-C₁₀ fatty acid dimethylamide) and chlorinated hydrocarbons. An EC product may spontaneously emulsify on addition to water, to produce an emulsion with sufficient stability to allow spray application through appropriate equipment.

Preparation of an EW involves obtaining a compound of Formula (I) or (II) either as a liquid (if it is not a liquid at room temperature, it may be melted at a reasonable temperature, typically below 70°C) or in solution (by dissolving it in an appropriate solvent) and then emulsifying the resultant liquid or solution into water containing one or more SFAs, under high shear, to produce an emulsion. Suitable solvents for use in EWs include vegetable oils, chlorinated hydrocarbons (such as chlorobenzenes), aromatic solvents (such as alkylbenzenes or alkylnaphthalenes) and other appropriate organic solvents which have a low solubility in water.

Microemulsions (ME) may be prepared by mixing water with a blend of one or more solvents with one or more SFAs, to produce spontaneously a thermodynamically stable isotropic liquid formulation. A compound of Formula (I) is present initially in either the water or the solvent/SFA blend. Suitable solvents for use in MEs include those hereinbefore described for use in ECs or in EWs. An ME may be either an oil-in-water or a water-in-oil system (which system is present may be determined by conductivity measurements) and may be suitable for mixing water-soluble and oil-soluble pesticides in the same formulation. An ME is suitable for dilution into water, either remaining as a microemulsion or forming a conventional oil-in-water emulsion.

Suspension concentrates (SC) may comprise aqueous or non-aqueous suspensions of finely divided insoluble solid particles of a compound of Formula (I) or (II). SCs may be prepared by ball or bead milling the solid compound of Formula (I) or (II) in a suitable medium, optionally with one or more dispersing agents, to produce a fine particle suspension of the compound. One or more wetting agents may be included in the composition and a suspending agent may be included to reduce the

rate at which the particles settle. Alternatively, a compound of Formula (I) or (II) may be dry milled and added to water, containing agents hereinbefore described, to produce the desired end product.

5 Aerosol formulations comprise a compound of Formula (I) or (II) and a suitable propellant (for example *n*-butane). A compound of Formula (I) or (II) may also be dissolved or dispersed in a suitable medium (for example water or a water miscible liquid, such as *n*-propanol) to provide compositions for use in non-pressurised, hand-actuated spray pumps.

10 Capsule suspensions (CS) may be prepared in a manner similar to the preparation of EW formulations but with an additional polymerisation stage such that an aqueous dispersion of oil droplets is obtained, in which each oil droplet is encapsulated by a polymeric shell and contains a compound of Formula (I) and, optionally, a carrier or diluent therefor. The polymeric shell may be produced by either an interfacial polycondensation reaction or by a coacervation procedure. The
15 compositions may provide for controlled release of the compound of Formula (I) or (II) and they may be used for seed treatment. A compound of Formula (I) or (II) may also be formulated in a biodegradable polymeric matrix to provide a slow, controlled release of the compound.

20 The composition may include one or more additives to improve the biological performance of the composition, for example by improving wetting, retention or distribution on surfaces; resistance to rain on treated surfaces; or uptake or mobility of a compound of Formula (I) or (II). Such additives include surface active agents (SFAs), spray additives based on oils, for example certain mineral oils or natural plant oils (such as soy bean and rape seed oil), and blends of these with other bio-enhancing
25 adjuvants (ingredients which may aid or modify the action of a compound of Formula (I)).

Wetting agents, dispersing agents and emulsifying agents may be SFAs of the cationic, anionic, amphoteric or non-ionic type.

30 Suitable SFAs of the cationic type include quaternary ammonium compounds (for example cetyltrimethyl ammonium bromide), imidazolines and amine salts.

Suitable anionic SFAs include alkali metals salts of fatty acids, salts of aliphatic monoesters of sulphuric acid (for example sodium lauryl sulphate), salts of sulphonated aromatic compounds (for example sodium dodecylbenzenesulphonate, calcium dodecylbenzenesulphonate, butylnaphthalene sulphonate and mixtures of sodium di-*isopropyl*- and tri-*isopropyl*-naphthalene sulphonates), ether sulphates, alcohol ether sulphates (for example sodium laureth-3-sulphate), ether carboxylates (for example sodium laureth-3-carboxylate), phosphate esters (products from the reaction between one or more fatty alcohols and phosphoric acid (predominately mono-esters) or phosphorus pentoxide (predominately di-esters), for example the reaction between lauryl alcohol and tetraphosphoric acid; additionally these products may be ethoxylated), sulphosuccinamates, paraffin or olefine sulphonates, taurates and lignosulphonates.

Suitable SFAs of the amphoteric type include betaines, propionates and glycines.

Suitable SFAs of the non-ionic type include condensation products of alkylene oxides, such as ethylene oxide, propylene oxide, butylene oxide or mixtures thereof, with fatty alcohols (such as oleyl alcohol or cetyl alcohol) or with alkylphenols (such as octylphenol, nonylphenol or octylcresol); partial esters derived from long chain fatty acids or hexitol anhydrides; condensation products of said partial esters with ethylene oxide; block polymers (comprising ethylene oxide and propylene oxide); alkanolamides; simple esters (for example fatty acid polyethylene glycol esters); amine oxides (for example lauryl dimethyl amine oxide); and lecithins.

Suitable suspending agents include hydrophilic colloids (such as polysaccharides, polyvinylpyrrolidone or sodium carboxymethylcellulose) and swelling clays (such as bentonite or attapulgite).

The composition of the present may further comprise at least one additional pesticide. For example, the compounds according to the invention can also be used in combination with other herbicides or plant growth regulators. In a preferred embodiment the additional pesticide is a herbicide and/or herbicide safener. Examples of such mixtures are (in which 'I' represents a compound of Formula I or II). I + acetochlor, I + acifluorfen, I + acifluorfen-sodium, I + aclonifen, I + acrolein, I +

alachlor, I + alloxymid, I + ametryn, I + amicarbazone, I + amidosulfuron, I + aminopyralid, I + amitrole, I + anilofos, I + asulam, I + atrazine, I + azafenidin, I + azimsulfuron, I + BCPC, I + beflubutamid, I + benazolin, I + bencarbazon, I + benfluralin, I + benfuresate, I + bensulfuron, I + bensulfuron-methyl, I + bensulide, I + bentazone, I + benzfendizone, I + benzobicyclon, I + benzofenap, I + bicyclopiron, I + bifenox, I + bilanafos, I + bispyribac, I + bispyribac-sodium, I + borax, I + bromacil, I + bromobutide, I + bromoxynil, I + butachlor, I + butamifos, I + butralin, I + butoxydim, I + butylate, I + cacodylic acid, I + calcium chlorate, I + cafenstrole, I + carbetamide, I + carfentrazone, I + carfentrazone-ethyl, I + chlorflurenol, I + chlorflurenol-methyl, I + chloridazon, I + chlorimuron, I + chlorimuron-ethyl, I + chloroacetic acid, I + chlorotoluron, I + chlorpropham, I + chlorsulfuron, I + chlorthal, I + chlorthal-dimethyl, I + cinidon-ethyl, I + cinmethylin, I + cinosulfuron, I + cisanilide, I + clethodim, I + clodinafop, I + clodinafop-propargyl, I + clomazone, I + clomeprop, I + clopyralid, I + cloransulam, I + cloransulam-methyl, I + cyanazine, I + cycloate, I + cyclosulfamuron, I + cycloxydim, I + cyhalofop, I + cyhalofop-butyl, I + 2,4-D, I + daimuron, I + dalapon, I + dazomet, I + 2,4-DB, I + I + desmedipham, I + dicamba, I + dichlobenil, I + dichlorprop, I + dichlorprop-P, I + diclofop, I + diclofop-methyl, I + diclosulam, I + difenzoquat, I + difenzoquat metilsulfate, I + diflufenican, I + diflufenzopyr, I + dimefuron, I + dimepiperate, I + dimethachlor, I + dimethametryn, I + dimethenamid, I + dimethenamid-P, I + dimethipin, I + dimethylarsinic acid, I + dinitramine, I + dinoterb, I + diphenamid, I + dipropetryn, I + diquat, I + diquat dibromide, I + dithiopyr, I + diuron, I + endothal, I + EPTC, I + esprocarb, I + ethalfluralin, I + ethametsulfuron, I + ethametsulfuron-methyl, I + ethephon, I + ethofumesate, I + ethoxyfen, I + ethoxysulfuron, I + etobenzanid, I + fenoxaprop-P, I + fenoxaprop-P-ethyl, I + fentrazamide, I + ferrous sulfate, I + flamprop-M, I + flazasulfuron, I + florasulam, I + fluazifop, I + fluazifop-butyl, I + fluazifop-P, I + fluazifop-P-butyl, I + fluazolate, I + flucarbazone, I + flucarbazone-sodium, I + flucetosulfuron, I + fluchloralin, I + flufenacet, I + flufenpyr, I + flufenpyr-ethyl, I + flumetralin, I + flumetsulam, I + flumiclorac, I + flumiclorac-pentyl, I + flumioxazin, I + flumipropin, I + fluometuron, I + fluoroglycofen, I + fluoroglycofen-ethyl, I + fluoxaprop, I + flupoxam, I + flupropacil, I + flupropanate, I + flupyrsulfuron, I + flupyrsulfuron-methyl-sodium, I + flurenol, I + fluridone, I + flurochloridone, I + fluroxypyr, I + flurtamone, I + fluthiacet, I + fluthiacet-methyl, I

- + fomesafen, I + foramsulfuron, I + fosamine, I + glufosinate, I + glufosinate-ammonium, I + glyphosate, I + halauxifen, I + halosulfuron, I + halosulfuron-methyl, I + haloxyfop, I + haloxyfop-P, I + hexazinone, I + imazamethabenz, I + imazamethabenz-methyl, I + imazamox, I + imazapic, I + imazapyr, I + imazaquin, I + imazethapyr, I + imazosulfuron, I + indanofan, I + indaziflam, I + iodomethane, I + iodosulfuron, I + iodosulfuron-methyl-sodium, I + ioxynil, I + isoproturon, I + isouron, I + isoxaben, I + isoxachlortole, I + isoxaflutole, I + isoxapyrifop, I + karbutilate, I + lactofen, I + lenacil, I + linuron, I + mecoprop, I + mecoprop-P, I + mefenacet, I + mefluidide, I + mesosulfuron, I + mesosulfuron-methyl, I + mesotrione,
- 10 I + metam, I + metamifop, I + metamidron, I + metazachlor, I + methabenzthiazuron, I + methazole, I + methylarsonic acid, I + methyldymron, I + methyl isothiocyanate, I + metolachlor, I + S-metolachlor, I + metosulam, I + metoxuron, I + metribuzin, I + metsulfuron, I + metsulfuron-methyl, I + molinate, I + monolinuron, I + naproanilide, I + napropamide, I + naptalam, I + neburon, I + nicosulfuron, I + n-methyl glyphosate,
- 15 I + nonanoic acid, I + norflurazon, I + oleic acid (fatty acids), I + orbencarb, I + orthosulfamuron, I + oryzalin, I + oxadiargyl, I + oxadiazon, I + oxasulfuron, I + oxaziclomefone, I + oxyfluorfen, I + paraquat, I + paraquat dichloride, I + pebulate, I + pendimethalin, I + penoxsulam, I + pentachlorophenol, I + pentanochlor, I + pentoxazone, I + pethoxamid, I + phenmedipham, I + picloram, I + picolinafen, I +
- 20 pinoxaden, I + piperophos, I + pretilachlor, I + primisulfuron, I + primisulfuron-methyl, I + prodiamine, I + profoxydim, I + prohexadione-calcium, I + prometon, I + prometryn, I + propachlor, I + propanil, I + propaquizafop, I + propazine, I + propham, I + propisochlor, I + propoxycarbazone, I + propoxycarbazone-sodium, I + propyzamide, I + prosulfocarb, I + prosulfuron, I + pyraclonil, I + pyraflufen, I +
- 25 pyraflufen-ethyl, I + pyrasulfotole, I + pyrazolynate, I + pyrazosulfuron, I + pyrazosulfuron-ethyl, I + pyrazoxyfen, I + pyribenzoxim, I + pyributicarb, I + pyridafol, I + pyridate, I + pyriftalid, I + pyriminobac, I + pyriminobac-methyl, I + pyrimisulfan, I + pyrithiobac, I + pyrithiobac-sodium, I + pyroxasulfone, I + pyroxsulam, I + quinclorac, I + quinmerac, I + quinclamine, I + quizalofop, I +
- 30 quizalofop-P, I + rimsulfuron, I + saflufenacil, I + sethoxydim, I + siduron, I + simazine, I + simetryn, I + sodium chlorate, I + sulcotrione, I + sulfentrazone, I + sulfometuron, I + sulfometuron-methyl, I + sulfosate, I + sulfosulfuron, I + sulfuric acid, I + tebuthiuron, I + tefuryltrione, I + tembotrione, I + tepraloxydim, I + terbacil,

I + terbutometon, I + terbuthylazine, I + terbutryn, I + thenylchlor, I + thiazopyr, I + thifensulfuron, I + thiencarbazone, I + thifensulfuron-methyl, I + thiobencarb, I + topramezone, I + tralkoxydim, I + tri-allate, I + triasulfuron, I + triaziflam, I + tribenuron, I + tribenuron-methyl, I + triclopyr, I + trietazine, I + trifloxysulfuron, I + trifloxysulfuron-sodium, I + trifluralin, I + triflusulfuron, I + triflusulfuron-methyl, I + trihydroxytriazine, I + trinexapac-ethyl, I + tritosulfuron, I + [3-[2-chloro-4-fluoro-5-(1-methyl-6-trifluoromethyl-2,4-dioxo-1,2,3,4-tetrahydropyrimidin-3-yl)phenoxy]-2-pyridyloxy]acetic acid ethyl ester (CAS RN 353292-31-6). The compounds of the present invention may also be combined with herbicidal compounds disclosed in WO06/024820 and/or WO07/096576.

The mixing partners of the compound of Formula (I) or (II) may also be in the form of esters or salts, as mentioned e.g. in The Pesticide Manual, Fourteenth Edition, British Crop Protection Council, 2006.

The compound of Formula (I) or (II) can also be used in mixtures with other agrochemicals such as fungicides, nematicides or insecticides, examples of which are given in The Pesticide Manual.

The mixing ratio of the compound of Formula (I) or (II) to the mixing partner is preferably from 1: 100 to 1000:1.

The mixtures can advantageously be used in the above-mentioned formulations (in which case "active ingredient" relates to the respective mixture of compound of Formula (I) or (II) with the mixing partner).

The compounds of Formula (I) or (II) according to the invention can also be used in combination with one or more safeners. Likewise, mixtures of a compound of Formula (I) or (II) according to the invention with one or more further herbicides can also be used in combination with one or more safeners. The safeners can be AD 67 (MON 4660), benoxacor, cloquintocet-mexyl, cyprosulfamide (CAS RN 221667-31-8), dichlormid, fenchlorazole-ethyl, fenclorim, fluxofenim, furilazole and the corresponding R isomer, isoxadifen-ethyl, mefenpyr-diethyl, oxabetrinil, N-isopropyl-4-(2-methoxy-benzoylsulfamoyl)-benzamide (CAS RN 221668-34-4). Other possibilities include safener compounds disclosed in, for example, EP0365484 e.g N-(2-methoxybenzoyl)-4-[(methylaminocarbonyl)amino]benzenesulfonamide.

Particularly preferred are mixtures of a compound of Formula (I) or (II) with

cyprosulfamide, isoxadifen-ethyl, cloquintocet-mexyl and/or N-(2-methoxybenzoyl)-4-[(methyl-aminocarbonyl)amino]benzenesulfonamide.

The safeners of the compound of Formula (I) or (II) may also be in the form of esters or salts, as mentioned e.g. in The Pesticide Manual, 14th Edition (BCPC), 2006.

- 5 The reference to cloquintocet-mexyl also applies to a lithium, sodium, potassium, calcium, magnesium, aluminium, iron, ammonium, quaternary ammonium, sulfonium or phosphonium salt thereof as disclosed in WO 02/34048, and the reference to fenchlorazole-ethyl also applies to fenchlorazole, etc.

- 10 Preferably the mixing ratio of compound of Formula (I) or (II) to safener is from 100:1 to 1:10, especially from 20:1 to 1:1.

The mixtures can advantageously be used in the above-mentioned formulations (in which case "active ingredient" relates to the respective mixture of compound of Formula (I) or (II) with the safener).

- 15 The present invention still further provides a method of selectively controlling weeds at a locus comprising crop plants and weeds, wherein the method comprises application to the locus of a weed controlling amount of a composition according to the present invention. 'Controlling' means killing, reducing or retarding growth or preventing or reducing germination. Generally the plants to be controlled are unwanted plants (weeds). 'Locus' means the area in which the plants are growing or
20 will grow.

- The rates of application of compounds of Formula (I) or (II) may vary within wide limits and depend on the nature of the soil, the method of application (pre- or post-emergence; seed dressing; application to the seed furrow; no tillage application etc.), the crop plant, the weed(s) to be controlled, the prevailing climatic conditions,
25 and other factors governed by the method of application, the time of application and the target crop. The compounds of Formula (I) or (II) according to the invention are generally applied at a rate of from 10 to 2000 g/ha, especially from 50 to 1000 g/ha.

- The application is generally made by spraying the composition, typically by tractor mounted sprayer for large areas, but other methods such as dusting (for
30 powders), drip or drench can also be used.

Useful plants in which the composition according to the invention can be used include crops such as cereals, for example barley and wheat, cotton, oilseed rape,

sunflower, maize, rice, soybeans, sugar beet, sugar cane and turf. Maize, wheat and barley are particularly preferred.

Crop plants can also include trees, such as fruit trees, palm trees, coconut trees or other nuts. Also included are vines such as grapes, fruit bushes, fruit plants and
5 vegetables.

Crops are to be understood as also including those crops which have been rendered tolerant to herbicides or classes of herbicides (e.g. ALS-, GS-, EPSPS-, PPO-, ACCase- and HPPD-inhibitors) by conventional methods of breeding or by genetic engineering. An example of a crop that has been rendered tolerant to
10 imidazolinones, e.g. imazamox, by conventional methods of breeding is Clearfield® summer rape (canola). Examples of crops that have been rendered tolerant to herbicides by genetic engineering methods include e.g. glyphosate- and glufosinate-resistant maize varieties commercially available under the trade names RoundupReady® and LibertyLink®.

15 In a preferred embodiment the crop plant is rendered tolerant to HPPD-inhibitors via genetic engineering. Methods of rendering crop plants tolerant to HPPD-inhibitors are known, for example from WO0246387. Thus in an even more preferred embodiment the crop plant is transgenic in respect of a polynucleotide comprising a DNA sequence which encodes an HPPD-inhibitor resistant HPPD enzyme derived
20 from a bacterium, more particularly from *Pseudomonas fluorescens* or *Shewanella colwelliana*, or from a plant, more particularly, derived from a monocot plant or, yet more particularly, from a barley, maize, wheat, rice, *Brachiaria*, *Chenchrus*, *Lolium*, *Festuca*, *Setaria*, *Eleusine*, *Sorghum* or *Avena* species.

Crops are also to be understood as being those which have been rendered
25 resistant to harmful insects by genetic engineering methods, for example Bt maize (resistant to European corn borer), Bt cotton (resistant to cotton boll weevil) and also Bt potatoes (resistant to Colorado beetle). Examples of Bt maize are the Bt 176 maize hybrids of NK® (Syngenta Seeds). The Bt toxin is a protein that is formed naturally by *Bacillus thuringiensis* soil bacteria. Examples of toxins, or transgenic plants able to
30 synthesise such toxins, are described in EP-A-451 878, EP-A-374 753, WO 93/07278, WO 95/34656, WO 03/052073 and EP-A-427 529. Examples of transgenic plants comprising one or more genes that code for an insecticidal resistance and express one or more toxins are KnockOut® (maize), Yield Gard® (maize), NuCOTIN33B®

(cotton), Bollgard® (cotton), NewLeaf® (potatoes), NatureGard® and Protexcta®. Plant crops or seed material thereof can be both resistant to herbicides and, at the same time, resistant to insect feeding ("stacked" transgenic events). For example, seed can have the ability to express an insecticidal Cry3 protein while at the same time being tolerant to glyphosate.

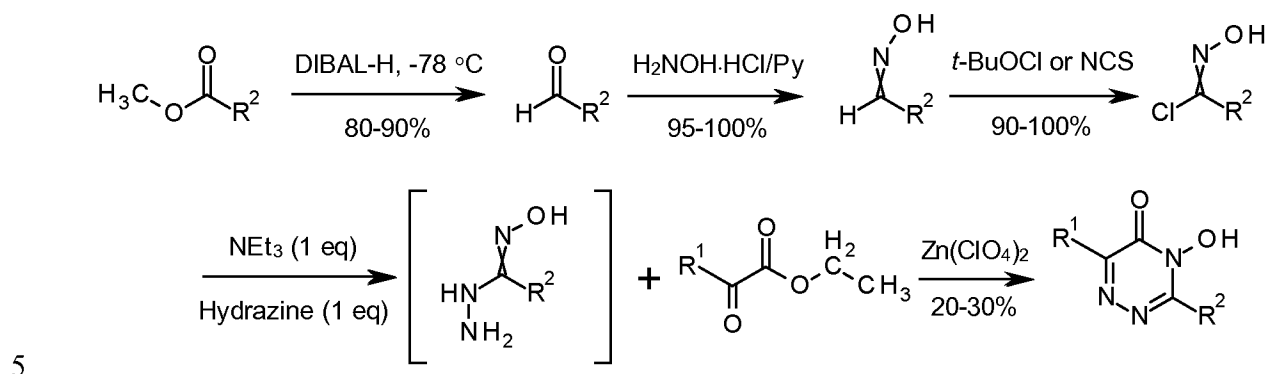
Crops are also to be understood to include those which are obtained by conventional methods of breeding or genetic engineering and contain so-called output traits (e.g. improved storage stability, higher nutritional value and improved flavour).

Other useful plants include turf grass for example in golf-courses, lawns, parks and roadsides, or grown commercially for sod, and ornamental plants such as flowers or bushes.

The compositions can be used to control unwanted plants (collectively, 'weeds'). The weeds to be controlled may be both monocotyledonous species, for example *Agrostis*, *Alopecurus*, *Avena*, *Brachiaria*, *Bromus*, *Cenchrus*, *Cyperus*, *Digitaria*, *Echinochloa*, *Eleusine*, *Lolium*, *Monochoria*, *Rottboellia*, *Sagittaria*, *Scirpus*, *Setaria* and *Sorghum*, and dicotyledonous species, for example *Abutilon*, *Amaranthus*, *Ambrosia*, *Chenopodium*, *Chrysanthemum*, *Conyza*, *Galium*, *Ipomoea*, *Nasturtium*, *Sida*, *Sinapis*, *Solanum*, *Stellaria*, *Veronica*, *Viola* and *Xanthium*. Weeds can also include plants which may be considered crop plants but which are growing outside a crop area ('escapes'), or which grow from seed left over from a previous planting of a different crop ('volunteers'). Such volunteers or escapes may be tolerant to certain other herbicides.

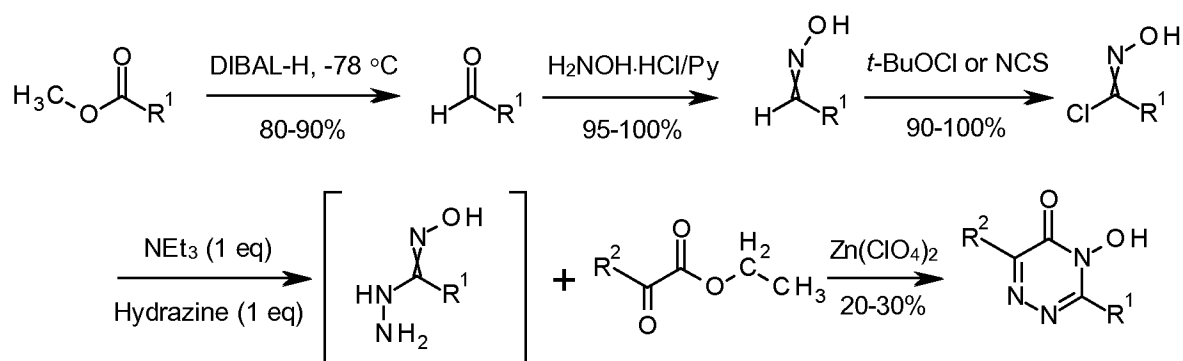
The compounds of the present invention can be prepared using the following schemes.

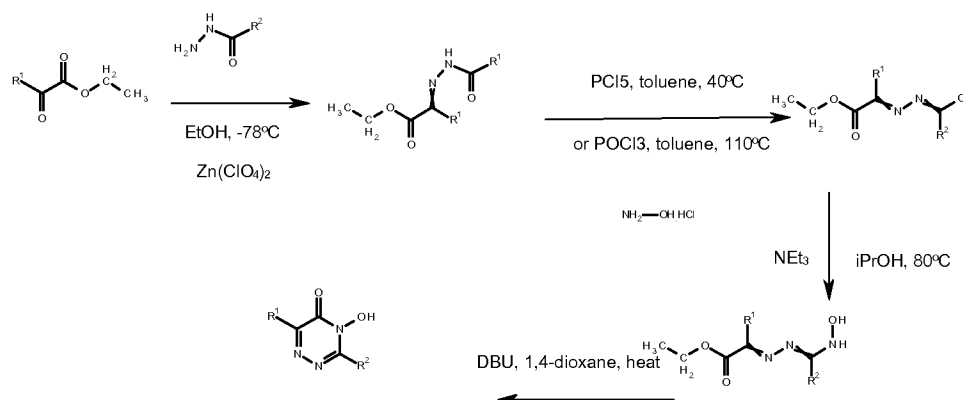
Scheme 1: Preparation of Compounds of Formula (I), wherein R⁴ is hydrogen.



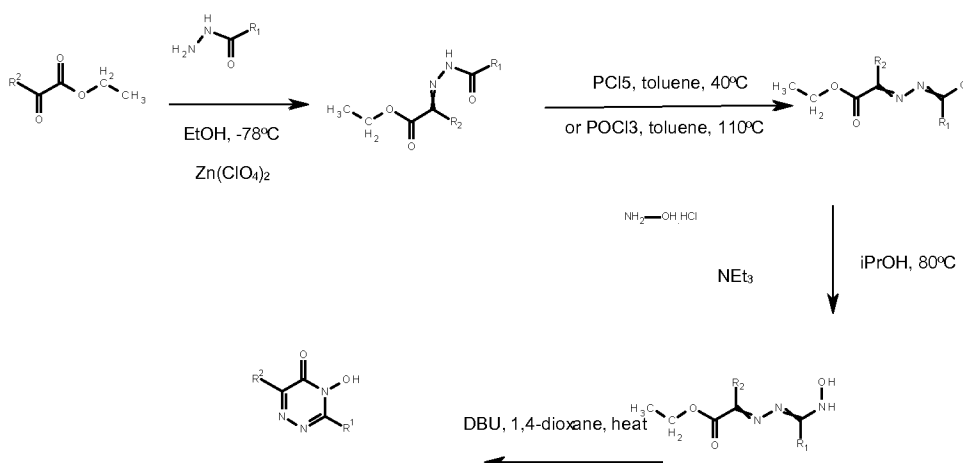
Scheme 2: Preparation of Compounds of Formula (II), wherein R⁴ is hydrogen.

10

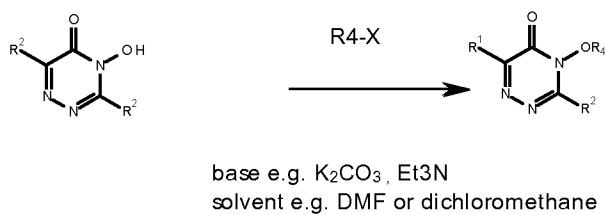


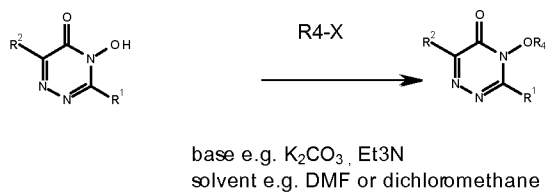
Scheme 3: Preparation of Compounds of Formula (I), wherein R⁴ is hydrogen.

5

Scheme 4: Preparation of Compounds of Formula (II), wherein R⁴ is hydrogen.

10

Scheme 5: Preparation of Compounds of Formula (I), wherein R⁴ is not H

Scheme 6: Preparation of Compounds of Formula (II), wherein R⁴ is not H

Example 1: 4-Hydroxy-6-isopropyl-3-[2-methylsulfonyl-4-(trifluoromethyl)-phenyl]-1,2,4-triazin-5-one (Compound 1.028)

Step 1: (1E)-2-methylsulfonyl-4-(trifluoromethyl)benzaldehyde oxime.

5

To a stirred solution of 2-methylsulfonyl-4-(trifluoromethyl)benzaldehyde (10.0g) in pyridine (50.0 mL) and ethanol (50.0mL) is added hydroxylamine hydrochloride (2.76g) and the reaction is refluxed overnight. The reaction mixture is then diluted with ethyl acetate, washed with water (2x), then aqueous FeSO₄, then 1M HCl and the organic phase is passed through a phase separator and concentrated in vacuo to yield an off white solid, (1E)-2-methylsulfonyl-4-(trifluoromethyl)benzaldehyde oxime (9.72g).

10

¹H NMR (400 MHz, Methanol) δ ppm 8.93 (s, 1 H) 8.30 (t, J=4.0 Hz, 2 H) 7.97 - 8.11 (m, 1 H) 3.24 (s, 3 H)

15

Step 2: (1Z)-N-hydroxy-2-methylsulfonyl-4-(trifluoromethyl)benzimidoyl chloride

20

To a solution of (1E)-2-methylsulfonyl-4-(trifluoromethyl)benzaldehyde oxime (1.0 g) in N,N-dimethylformamide (8.8g), cooled in an ice/brine bath, is added drop wise tert-butyl hypochlorite (0.61g) over 5 minutes. The colourless solution turns bright yellow and is stirred with cooling for 15 minutes before allowing slowly to attain ambient temperature and then stirred for 1h. The reaction mixture is diluted with ether and washed with water (x2), passed through a phase separator and reduced under vacuum to give an off yellow solid, (1Z)-N-hydroxy-2-methylsulfonyl-4-(trifluoromethyl)benzimidoyl chloride (1.02g).

25

Steps 3-5: 4-hydroxy-6-isopropyl-3-[2-methylsulfonyl-4-trifluoromethyl)phenyl]-1,2,4-triazin-5-one

30

Step 3

To a solution of hydrazine hydrate (0.50g) in ethanol (5mL) at 0 C is slowly added a suspension of (1Z)-N-hydroxy-2-methylsulfonyl-4-(trifluoromethyl)-benzimidoyl chloride (1.0 g) in ethanol (5mL) over 5 min. During the addition a white precipitate

formed and remained. The reaction mixture is stirred at 0°C for 1 h 10 min.

Step 4

To the reaction mixture is added ethyl 3-methyl-2-oxo-butanoate (0.96g) and zinc
5 diperchlorate (0.0088g). The reaction mixture is then stirred at room temperature for
30min during which a free flowing suspension is formed. Two portions of ethyl 3-
methyl-2-oxo-butanoate (each of 0.96g) are added to the reaction mixture and the
precipitate on the sides of the flask washed down with ethanol (~ 5 ml). All the
precipitate dissolved and a clear yellow solution formed.

10

Step 5

To the remaining solution is added iso propylamine (2.9g) and the reaction mixture is
stirred at room temperature overnight. LCMS shows conversion of all the Z
hydrazone to the desired product. The reaction mixture is acidified with 1 M HCl, the
15 layers separated and the organic washed with brine, passed through a phase separator
and reduced under vacuum to give a yellow solid. This is then purified to give a
yellow solid, 4-hydroxy-6-isopropyl-3-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-
1,2,4-triazin-5-one (0.22g)

20 **Example 2: 6-(2,4-dichlorophenyl)-4-hydroxy-3-isopropyl-1,2,4-triazin-5-one** **(Compound 2.027)**

Step 1: (1Z)-N-hydroxy-2-methyl-propanimidoyl chloride

25 To a solution of (1E)-2-methylpropanal oxime (5.0g) in N,N-dimethylformamide (1.3
mL/mmol, 75 mL), cooled in an ice/brine bath, is added N-chlorosuccinimide (8.8g,
66 mmol) over 10 minutes. The colourless solution is warmed up to room temperature
slowly and left to stand at room temperature overnight. The reaction mixture is diluted
with ether and washed with 1:1 water: brine (x2), passed through a phase separator
30 and reduced under vacuum to give a colourless oil, (1Z)-N-hydroxy-2-methyl-
propanimidoyl chloride (7.66g) that contains approximately 10% diethyl ether.

Step 2: N-amino-N'-hydroxy-2-methyl-propanamidine

To a solution of hydrazine hydrate (0.1g) in ethanol (0.5 mL/mmol, 0.93 mL) is added N,N-diethylethanamine (0.19g). The reaction mixture is cooled to 0°C and (1Z)-N-hydroxy-2-methyl-propanimidoyl chloride (0.25g) in ethanol (0.5 mL/mmol, 0.93 mL) is added via syringe pump over 1.5 hours. The crude product is used directly in the next step.

Step 3: 6-(2,4-dichlorophenyl)-4-hydroxy-3-isopropyl-1,2,4-triazin-5-one

To the reaction mixture is added zinc diperchlorate (0.73g) and methyl 2-(2,4-dichlorophenyl)-2-oxo-acetate (0.45g) and the reaction mixture is allowed to warm up to room temperature slowly over 30 minutes. The reaction mixture is then left to stand overnight at room temperature. The reaction mixture is acidified with 1 M HCl, the layers separated and the organic washed with brine, passed through a phase separator and reduced under vacuum to give a yellow oil. This is then purified on the Fraction-lynx to give 6-(2,4-dichlorophenyl)-4-hydroxy-3-isopropyl-1,2,4-triazin-5-one as an off-white foam (0.02g)

Example 3:

4-hydroxy-3-isopropyl-6-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-1,2,4-triazin-5-one (Compound 4.001)

Step 1: 2-tetrahydrothiophen-1-ium-1-ylacetonitrile bromide

To tetrahydrothiophene (8.49g) is added 2-bromoacetonitrile (10.5g). The reaction is stirred at room temperature for 16 hours. 150mL diethylether is added and the solid broken with a spatula. The suspension is stirred for 2 hours, occasionally breaking the lumps with a spatula to produce a suspension. The white solid is collected rapidly by filtration and put in a flask to dry on high vacuum for 3 hours. 2-tetrahydrothiophen-1-ium-1-ylacetonitrile bromide (14.75g).

¹H NMR (400 MHz, MeOD, δ ppm = 2.35 - 2.46 (m, 2 H) 2.48 - 2.57 (m, 2 H) 3.75 (dt, *J*=13.09, 6.46 Hz, 2 H) 3.86 (dt, *J*=13.57, 6.93 Hz, 2 H)

Step 2: 3-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-3-oxo-2-(thiolan-1-ylidene)propanenitrile

5 2-(methoxymethyl)-6-(trifluoromethyl)pyridine-3-carboxylic acid (3.85 g) and HATU (9.53g) are suspended in dichloromethane (120.0 mL). 2-tetrahydrothiophen-1-ium-1-ylacetonitrile bromide (5.68g) followed by N-ethyl-N-isopropyl-propan-2-amine (6.35g) are added and the mixture is stirred at room temperature for 8 hours. The reaction is stopped and then washed with 2 x 40mL aqueous saturated ammonium
10 chloride. The dichloromethane layer is separated using a separation cartridge and concentrated *in vacuo*.

The crude product is purified on a silica cartridge using dichloromethane: methanol. Fractions containing the product are combined and concentrated *in vacuo* to yield 3-
15 [2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-3-oxo-2-(thiolan-1-ylidene)propanenitrile (8.0g).

¹H NMR (400 MHz, Chloroform) δ ppm = 2.17 (dd, *J*=10.66, 5.54 Hz, 2 H) 2.67 (dd, *J*=9.69, 6.08 Hz, 2 H) 3.34 (s, 3 H) 3.46 - 3.53 (m, 2 H) 3.53 - 3.59 (m, 2 H) 4.79 (s, 2 H) 7.64 (d, *J*=7.89 Hz, 1 H) 7.88
20 (d, *J*=7.89 Hz, 1 H)

Step 3: Ethyl 2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-oxo-acetate

3-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-3-oxo-2-(thiolan-1-
25 ylidene)propanenitrile (8.00g) is suspended in tetrahydrofuran (90.0 mL), ethanol (90.0 mL) and water (90.0 mL). Oxone (28.6g) is added in one portion and the mixture is stirred at room temperature for 30 minutes. The reaction is stopped and a solution of saturated sodium bicarbonate is added carefully to the mixture. The aqueous layer is extracted with 2 x 75.0mL dichloromethane and then the organic
30 layer is dried over sodium sulphate, filtered and concentrated *in vacuo*. The aqueous layer is basified with a diluted solution of NaOH then carefully bleached to destroy any remaining cyanide.

The crude product is put onto a silica cartridge, eluting with iso-hexane: ethyl acetate as solvent system. Fractions containing the product were combined and concentrated *in vacuo* to yield ethyl 2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-oxo-acetate (1.17g) as a translucent oil.

5

¹H NMR (500 MHz, Chloroform) δ ppm = 1.41 (t, *J*=7.15 Hz, 3 H) 3.32 (s, 3 H) 4.40 (q, *J*=7.09 Hz, 2 H) 4.77 (s, 2 H) 7.69 (d, *J*=8.07 Hz, 1 H) 7.99 (d, *J*=7.95 Hz, 1 H)

Step4: Ethyl-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-(2-

10 **methylpropanoylhydrazono)acetate**

Ethyl 2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-oxo-acetate (1.50g mmol) is dissolved in dioxane (50.0mL) and heated to 90°C. 2-methylpropanehydrazide (0.552g) is added portion wise and the mixture stirred for 9 hours. The reaction mixture is concentrated in vacuo and the residue suspended in 15.0mL diethylether. The resulting solid is collected by filtration to give the clean product as a white solid (420.0mg).

15

¹H NMR (400 MHz, Chloroform) δ ppm = 1.22 (br. s., 6 H) 1.33 (t, *J*=6.91 Hz, 3 H) 3.32 (s, 3 H) 3.54 (br. s., 1 H) 4.33 (q, *J*=6.97 Hz, 2 H) 4.55 (s, 2 H) 7.68 - 7.78 (m, 2 H) 8.08 (br. s., 1 H)

20

The filtrate is concentrated and liquid-loaded onto a silica cartridge using iso-hexane: ethyl acetate as the solvent system. The fractions containing the product are combined, added to the solid previously collected and concentrated *in vacuo* to yield ethyl (2E)-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-(2-methylpropanoylhydrazono)acetate (0.430 g, 1.15 mmol, 22.2% yield) as a white solid. NMR indicates the presence of the two regioisomers.

25

¹H NMR (400 MHz, Chloroform) δ ppm = 1.21 (d, *J*=6.60 Hz, 6 H) 1.33 (t, *J*=7.09 Hz, 3 H) 3.31 (s, 3 H) 3.53 (br. s., 1 H) 4.27 - 4.38 (m, 2 H) 4.54 (s, 2 H) 7.68 - 7.78 (m, 2 H) 8.15 (br. s., 1 H)

30

Step 5: Ethyl 2-[1-(hydroxyamino)-2-methyl-propylidene]hydrazono]-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]acetate

Ethyl (2E)-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-2-(2-methyl-propanoylhydrazono)acetate (1.08g) is dissolved in toluene (35mL) and the mixture heated to 100°C. Phosphorus oxychloride (0.552g) is added and the mixture is heated
5 for 3 hours. 0.4eq OPCl_3 is added and the mixture stirred for another 3 hours and the mixture was concentrated to about 5.0mL.

In another flask, hydroxylamine hydrochloride (1.3g) is suspended in propan-2-ol (5.00 mL). Triethylamine (1.91g) is added followed by the toluene solution of ethyl
10 (2E)-2-[(1-chloro-2-methyl-propylidene)hydrazono]-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]acetate (1.13g). The flask is rinsed with 2 x 5.0mL dioxane. The mixture is stirred at 80°C for 60 minutes. LC indicated complete conversion to the two desired regioisomers. The reaction is stopped and concentrated *in vacuo*. The crude product is diluted with 40 mL ethyl acetate and washed with 2 x
15 40mL water. The aqueous extract is extracted again with 40mL ethyl acetate and the organic layers are combined, dried over sodium sulphate, filtered and concentrated *in vacuo*.

The residue is liquid-loaded onto a silica cartridge eluting with dichloromethane: ethyl
20 acetate. Fractions containing the product are combined and concentrated *in vacuo* to yield a yellow oil. LC and TLC showed an impurity that could be removed using another solvent system, so the crude product is liquid loaded onto a silica cartridge eluting with iso-hexane: ethyl acetate. The fractions containing the product are combined and concentrated *in vacuo* to give ethyl 2-[[1-(hydroxyamino)-2-methyl-propylidene]hydrazono]-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]acetate
25 (560.0mg) as a pale yellow oil. NMR and LC indicated presence of the two hydrazone isomers (9:1 to 8:2 ratio).

Step 6: 4-hydroxy-3-isopropyl-6-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-1,2,4-triazin-5-one
30

Ethyl 2-[(Z)-[1-(hydroxyamino)-2-methyl-propylidene]hydrazono]-2-[2-(methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]acetate (560.0mg) is diluted in 1,4-dioxane (7.50 mL) and DBU (0.56g) is then added. The reaction is heated to 90°C for 2h30. The reaction is stopped, and poured into aqueous HCl (25.0mL). The product is
5 extracted using 2 x 20.0mL ethyl acetate and the organic layers are combined, dried over sodium sulphate, filtered and concentrated *in vacuo*. The residue is dry-loaded on a stacker of 2 x 24g columns, eluting with a mixture of water:ethanol:dioxane:triethylamine:toluene (0.5:2:4:2:10). The fractions containing the product are combined and concentrated *in vacuo* to give a dark orange oil. This is
10 partitioned between ethyl acetate and HCl (2.0M) and the organic is then collected, dried over sodium sulphate, filtered and concentrated *in vacuo* to give a pale brown foam solid (230.0mg). The residue is taken up in 10.0mL iso-hexane and sonicated for 5 minutes until a fine suspension is obtained. The resulting solid is collected by filtration and dried under suction for 2 hours to yield 4-hydroxy-3-isopropyl-6-[2-
15 (methoxymethyl)-6-(trifluoromethyl)-3-pyridyl]-1,2,4-triazin-5-one as a pale brown solid (198.0 mg).

¹H NMR (400 MHz, Chloroform) δ ppm = 1.50 (d, *J*=6.80 Hz, 6 H) 3.09 (s, 3 H) 3.47 - 3.55 (m, 1 H) 4.88 (s, 2 H) 7.74 (d, *J*=7.97 Hz, 1 H) 8.10 (d, *J*=7.97 Hz, 1 H)

20

Example 4. Synthesis of [3-isopropyl-6-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-5-oxo-1,2,4-triazin-4-yl] benzoate (CSCZ173713) as example of a procide

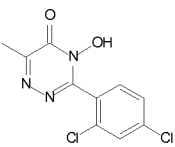
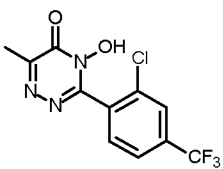
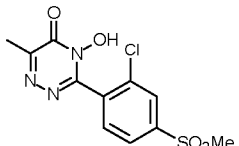
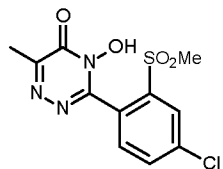
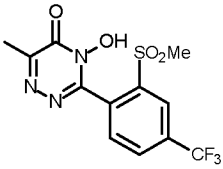
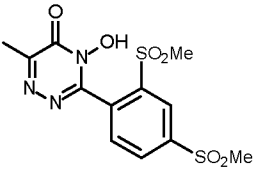
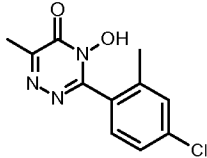
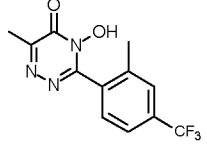
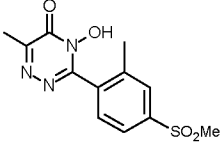
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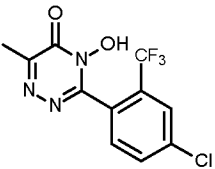
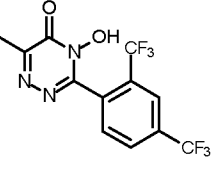
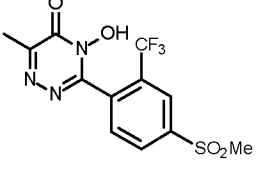
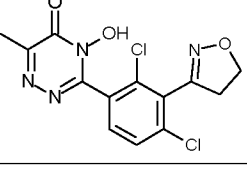
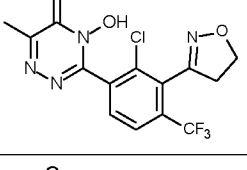
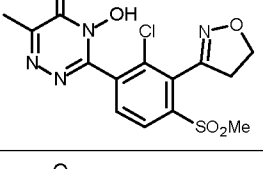
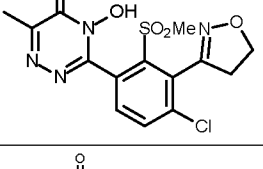
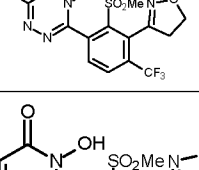
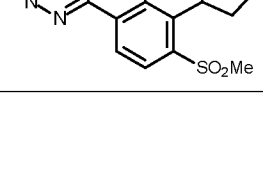
4-hydroxy-3-isopropyl-6-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-1,2,4-triazin-5-one (200 mg, 0.53 mmol) is suspended in dichloromethane (5 mL, 77.8 mmol) in a 25ml round-bottomed flask with ice-bath cooling. Triethylamine (0.2 mL, 1 mmol) is added dropwise and the solid material slowly dissolved giving a yellow solution.
30 Benzoyl chloride (0.15 mL, 1.3 mmol) is added. After 1 hour with ice-bath cooling, LCMS showed complete conversion to the desired product. The reaction mixture is diluted with dichloromethane and purified by column chromatography on silica, eluting with ethyl acetate: iso hexane, to give [3-isopropyl-6-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-5-oxo-1,2,4-triazin-4-yl] benzoate (225 mg, 0.47 mmol, 88

% yield) as a white foamy solid.

4-hydroxy-3-isopropyl-6-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-1,2,4-triazin-5-one is prepared from ethyl 2-[2-methylsulfonyl-4-(trifluoromethyl)phenyl]-2-oxo-
5 acetate analogously to the synthesis of compound 4.001 (Example 3).

TABLE C1 – Examples of herbicidal compounds of the present invention.

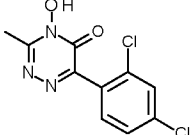
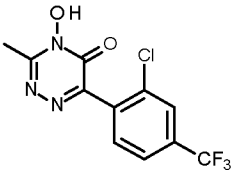
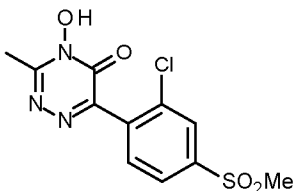
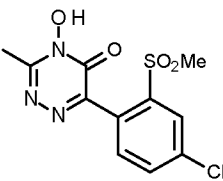
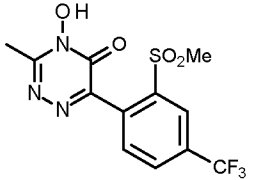
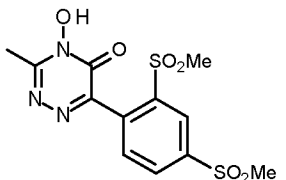
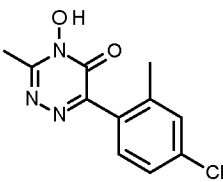
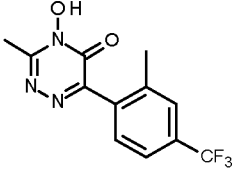
Compound Number	Structure	NMR
1.001		DMSO-d ₆ : ppm 12.76 (br. s., 1 H) 7.79 (d, J=1.2 Hz, 1 H) 7.50 - 7.63 (m, 2 H) 2.38 (s, 3 H)
1.002		
1.003		
1.004		
1.005		
1.006		
1.007		
1.008		
1.009		

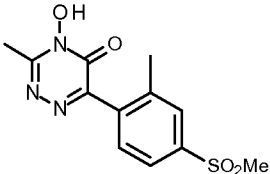
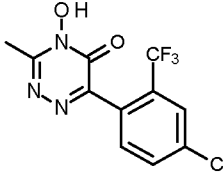
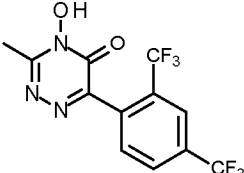
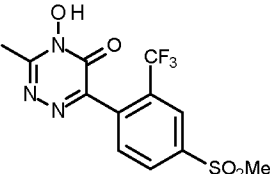
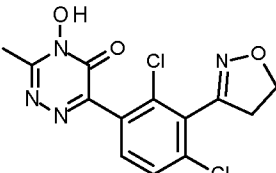
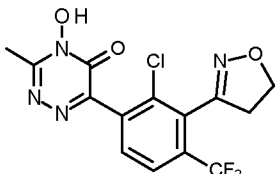
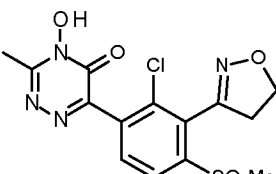
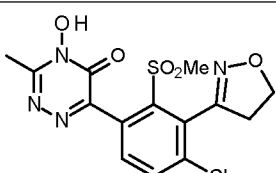
Compound Number	Structure	NMR
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1.011		
1.012		
1.013		
1.014		
1.015		
1.016		
1.017		
1.018		

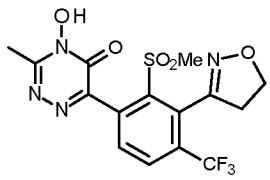
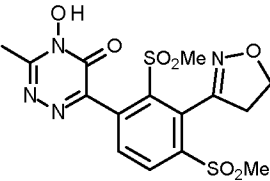
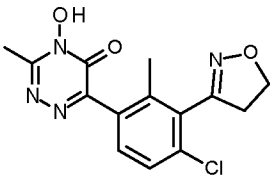
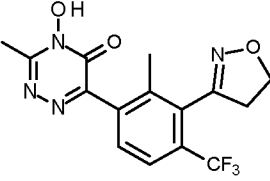
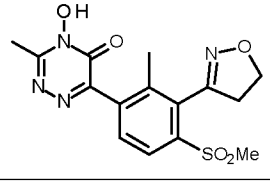
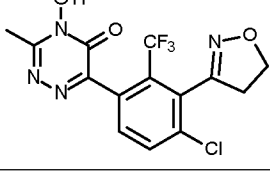
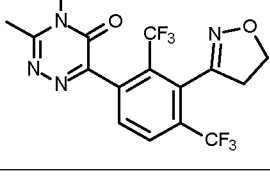
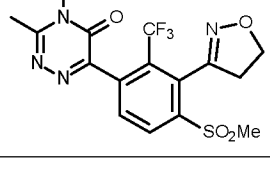
Compound Number	Structure	NMR
1.019		
1.020		
1.021		
1.022		
1.023		
1.024		
1.025		DMSO-d6: ppm 8.65 (d, J=1.5 Hz, 1 H) 8.46 (dd, J=8.0, 1.7 Hz, 1 H) 8.10 (d, J=7.9 Hz, 1 H) 3.40 (s, 3 H) 3.30 - 3.38 (m, 1 H) 1.24 (d, J=6.8 Hz, 6 H)
1.026		
1.027		CD3OD: ppm 7.68 (d, J=1.9 Hz, 1 H) 7.58 (d, J=8.3 Hz, 1 H) 7.53 (dd, J=8.3, 1.9 Hz, 1 H) 3.46 (spt, J=6.9 Hz, 1 H) 1.34 (d, J=6.8 Hz, 6 H)

Compound Number	Structure	NMR
1.028		CD3OD: ppm 8.42 (s, 1 H) 8.19 (d, J=7.8 Hz, 1 H) 7.93 (d, J=7.9 Hz, 1 H) 3.44 (sept, J= 6.7 Hz, 1 H) 3.29 (s, 3 H) 1.34 (d, J=6.8 Hz, 6 H)
1.029		CDCl3: ppm 8.11 (d, J=8.2 Hz, 1 H) 7.71 (d, J=8.2 Hz, 1 H) 7.21 (br. s., 1 H) 4.60 (t, J=10.0 Hz, 2 H) 3.46 (m, 1 H) 3.37 (br. s., 2 H) 3.21 (s, 3 H) 2.27 (s, 3 H) 1.37 (d, J=6.8 Hz, 6 H)
1.030		CD3CN: ppm 8.12 (d, J=1.59 Hz, 1 H), 8.01 (dd, J=7.95, 1.71 Hz, 1 H) , 7.79 (d, J=8.07 Hz, 1 H) , 3.43 (m, 1 H), 3.16 (s, 3 H), 1.33 (d, J=6.85 Hz, 6 H)
1.031		CDCl3: ppm 1.44 (d, J=6.85 Hz, 6 H) 3.29 (s, 2 H) 3.49 - 3.57 (m, 1 H) 4.07 (d, J=8.80 Hz, 2 H) 5.42 (s, 2 H) 7.78 (d, J=8.31 Hz, 1 H) 8.28 (d, J=8.31 Hz, 1 H)
1.032		CDCl3/CD3OD: ppm 8.11 (d, 1 H) 7.73 (dd, 1 H) 7.52 (d, 1 H) 3.27 (s, 3 H) 2.69 (s, 3 H)

TABLE C2 – Examples of herbicidal compounds of the present invention.

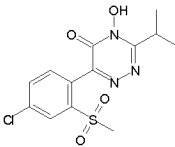
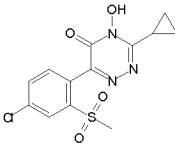
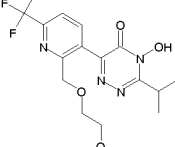
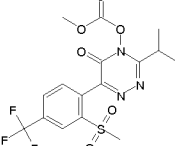
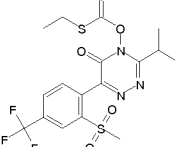
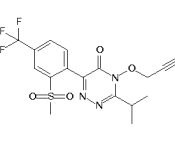
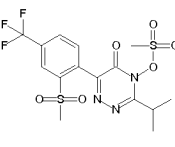
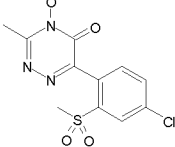
Compound Number	Structure	NMR
2.001		
2.002		
2.003		
2.004		
2.005		
2.006		
2.007		
2.008		

Compound Number	Structure	NMR
2.009		
2.010		
2.011		
2.012		
2.013		
2.014		
2.015		
2.016		

Compound Number	Structure	NMR
2.017		
2.018		
2.019		
2.020		
2.021		
2.022		
2.023		
2.024		

Compound Number	Structure	NMR
2.025		
2.026		
2.027		CD3OD: ppm 7.96 (m, 2 H) 7.31 (m, 2 H) 2.93 (q, J=7.5 Hz, 2 H) 1.35 (t, J=7.4 Hz, 3 H)
2.028		CDCl3: ppm 1.49 (d, J=6.97 Hz, 6 H) 3.30 (s, 3 H) 3.52 (dt, J=13.69, 6.85 Hz, 1 H) 7.75 (d, J=7.95 Hz, 1 H) 8.02 (d, J=7.67 Hz, 1 H) 8.42 (s, 1 H)
2.029		
2.030		CD3OD: ppm 8.35 (s, 1 H) 8.09 (d, 1 H) 7.74 (d, 1 H) 4.82 (s, 2 H) 3.50 (s, 3 H) 3.26 (s, 3 H)
2.031		CDCl3: ppm 8.40 (s, 1 H) 8.04 (d, 1 H) 7.77 (d, 1 H) 7.42 - 7.55 (m, 5 H) 5.29 (s, 2 H) 3.33 (s, 3 H) 3.06 (m, 1 H) 1.23 (d, 6 H)
2.032		CDCl3: ppm 8.38 (s, 1 H) 8.15 - 8.22 (m, 2 H) 8.02 (dd, 1 H) 7.73 - 7.83 (m, 2 H) 7.56 - 7.63 (m, 2 H) 3.30 (s, 3 H) 3.15 (dt, 1 H) 1.39 - 1.52 (m, 6 H)

Compound Number	Structure	NMR
2.033		CD3OD: ppm 2.68 (s, 3 H) 3.32 (s, 3H) 7.82 (d, J=8.07 Hz, 1 H) 8.18 - 8.22 (m, 1 H) 8.51 (d, J=1.47 Hz, 1 H)
2.034		CDCl3: ppm 1.51 (d, J=6.85 Hz, 6 H) 2.49 (s, 3 H) 2.67 (s, 3 H) 3.47 - 3.57 (m, 1 H) 7.54 (d, J=8.19 Hz, 1 H) 7.68 (s, 1 H) 7.74 (d, J=8.07 Hz, 1 H)
2.035		CDCl3: ppm 1.52 (d, J=6.85 Hz, 6 H) 2.30 (s, 3 H) 3.22 (s, 3 H) 3.39 (br. s., 2 H) 3.54 (dt, J=13.69, 6.85 Hz, 1 H) 4.60 (t, J=9.96 Hz, 2 H) 7.73 (d, J=8.19 Hz, 1 H) 8.10 (d, J=8.19 Hz, 1 H)
2.036		CD3CN: ppm 1.26 - 1.35 (m, 6 H) 3.21 (s, 3 H) 3.64 (d, J=6.12 Hz, 1 H) 8.02 (d, J=5.96 Hz, 1 H) 8.28 (d, J=7.80 Hz, 1 H) 8.43 (s, 1 H)
2.037		CD3OD: ppm 1.28 - 1.38 (m, 4 H) 2.61 - 2.67 (m, 1 H) 3.32 (s, 3 H) 7.84 (d, J=8.05 Hz, 1 H) 8.15 (d, J=7.99 Hz, 1 H) 8.40 (s, 1 H)
2.038		CDCl3: ppm 8.40 (s, 1 H) 8.05 (d, 1 H) 7.81 (d, 1 H) 3.32 (s, 3 H) 2.95 (d, 2 H) 1.34 (m, 1 H) 0.63 - 0.71 (m, 2 H) 0.38 - 0.44 (m, 2 H)
2.039		CD3OD: ppm 2.69 (s, 3 H) 3.32 (s, 3H) 7.85 (d, J=8.07 Hz, 1 H) 8.16 (d, J=7.34 Hz, 1 H) 8.41 (s, 1 H)
2.040		CDCl3: ppm 1.52 (d, J=6.85 Hz, 6 H) 3.26 (s, 3 H) 3.54 (s, 1 H) 4.05 (q, J=8.68 Hz, 2 H) 5.42 (s, 2 H) 7.72 (d, J=8.19 Hz, 1 H) 8.22 (d, J=8.07 Hz, 1 H)

Compound Number	Structure	NMR
2.041		CDC13: ppm 8.14 (d, 1 H) 7.73 (dd, 1 H) 7.54 (d, 1 H) 3.45 - 3.55 (m, 1 H) 3.28 (s, 3 H) 1.48 (d, 6 H)
2.042		CDC13: ppm 8.11 (br. s., 1 H) 7.70 (d, 1 H) 7.50 (d, 1 H) 3.25 (s, 3 H) 2.46 (br. m., 1 H) 1.52 (br. m., 2 H) 1.33 (br. m., 2 H)
2.043		CDC13: ppm 1.38 - 1.57 (m, 6 H) 3.18 - 3.27 (m, 5 H) 3.38 - 3.43 (m, 2 H) 3.51 - 3.61 (m, 1 H) 4.92 (br s, 2 H) 7.72 (d, J=7.97 Hz, 1 H) 8.09 (d, J=7.97 Hz, 1 H)
2.044		CDC13: ppm 8.38 (s, 1 H) 8.02 (d, 1 H) 7.76 (d, 1 H) 4.08 (s, 3 H) 3.28 (s, 3 H) 3.18 (dt, 1 H) 1.46 (d, 6 H)
2.045		CDC13: ppm 8.37 (s, 1 H) 8.01 (dd, 1 H) 7.75 (d, 1 H) 3.28 (s, 3 H) 3.11 - 3.17 (dt, 1 H) 3.04 - 3.11 (q, 2 H) 1.45 (d, 6 H) 1.39 - 1.44 (t, 3 H)
2.046		CDC13: ppm 1.45 (d, J=6.85 Hz, 6 H) 2.76 (t, J=2.45 Hz, 1 H) 3.28 (s, 3 H) 3.61 (quin, J=6.82 Hz, 1 H) 5.06 (d, J=2.45 Hz, 2 H) 7.75 (d, J=7.95 Hz, 1 H) 8.02 (dd, J=8.07, 1.22 Hz, 1 H) 8.37 (s, 1 H)
2.047		CDC13: ppm 1.49 (d, J=6.72 Hz, 6 H) 3.23 (s, 3 H) 3.40 - 3.52 (m, 1 H) 3.64 (s, 3 H) 7.76 (d, J=8.07 Hz, 1 H) 8.06 (d, J=7.72 Hz, 1 H) 8.41 (s, 1 H)
2.048		CDC13: ppm 8.09 (d, J=2.1 Hz, 1H), 7.73 (dd, J=2.1, 8.2 Hz, 1H), 7.53 (d, J=8.2 Hz, 1H), 4.13 (s, 3H), 3.26 (s, 3H), 2.68 (s, 3H)

Compound Number	Structure	NMR
2.049		CDCl ₃ : ppm 8.36 (s, 1 H) 8.01 (d, 1 H) 7.76 (d, 1 H) 6.63 (q, 1 H) 3.77 (s, 3 H) 3.51 (m, 1 H) 3.28 (s, 3 H) 1.72 (d, 3 H) 1.46 (d, 3 H) 1.39 (d, 3 H)
2.050		CD ₃ OD: ppm 7.99 (s, 1 H) 7.71 (d, 1 H) 7.51 (d, 1 H) 3.26 (s, 3 H) 2.77 (s, 3 H) 2.56 (s, 3 H)
2.051		
2.052		
2.053		
2.054		
2.055		CDCl ₃ : ppm 8.37 (s, 1 H) 8.03 (d, 1 H) 7.92 (d, 1 H) 3.56 (dt, 1 H) 1.49 (d, 6 H)
2.056		

Compound Number	Structure	NMR
2.057		
2.058		¹ H NMR (400MHz, Chloroform 14ZZ542h2) δ = 8.00 (d, J=8.2 Hz, 1H), 7.72 (d, J=8.1 Hz, 1H), 4.01 (s, 3H), 3.54 (td, J=7.0, 13.7 Hz, 1H), 3.21 (s, 3H), 2.33 (s, 3H), 1.52 (d, J=6.8 Hz, 6H)
2.059		CDCl ₃ : ppm 7.94 (d, J=8.19 Hz, 1 H) 7.44 (d, J=8.19 Hz, 1 H) 4.25 - 4.32 (m, 2 H) 3.81 - 3.87 (m, 2 H) 3.46 - 3.55 (m, 4 H) 3.32 (s, 3 H) 2.33 - 2.37 (m, 3 H) 1.52 (d, J=6.85 Hz, 6 H)
2.060		CDCl ₃ : ppm 7.87 - 7.94 (m, 1 H) 7.68 - 7.77 (m, 1 H) 3.27 (s, 3 H) 2.67 (s, 3 H) 2.49 - 2.56 (m, 1 H) 1.55 - 1.64 (m, 2 H) 1.36 - 1.45 (m, 2 H)
2.061		
2.062		
2.063		¹ H NMR (400MHz, Chloroform 14ZX476) δ = 7.34 (s, 1H), 4.30 - 4.25 (m, 2H), 4.17 (m, 2H), 3.55 - 3.50 (m, 2H), 2.77 (s, 3H), 2.62 - 2.58 (m, 2H), 2.51 - 2.45 (m, 1H), 2.25 (s, 3H), 1.56 (dd, J=3.1, 4.5 Hz, 2H), 1.35 (dd, J=3.2, 8.1 Hz, 2H)
2.064		CDCl ₃ : ppm 1.23 - 1.30 (m, 4 H) 1.31-1.40 (m, 4 H) 2.33 (br. s., 1 H) 2.62-2.69 (m, 1 H) 7.46 - 7.51 (m, 1 H) 7.75 - 7.80 (m, 1 H)

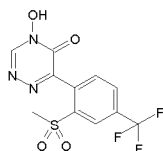
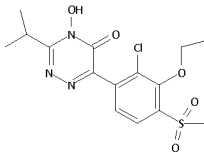
Compound Number	Structure	NMR
2.065		CD3OD: ppm 8.99 (s, 1H), 8.43 (s, 1H), 8.19 (d, J=8.1 Hz, 1H), 7.88 (d, J=8.1 Hz, 1H), (presumably under the MeOD peak) 3.34 - 3.31 (s, 3H)
2.066		¹ H NMR (400MHz, Chloroform) δ = 8.04 - 8.00 (d, 1H), 7.47 - 7.44 (d, 1H), 4.38 (q, J=7.0 Hz, 2H), 3.54 (quin, J=6.8 Hz, 1H), 3.31 (s, 3H), 1.53 (m, 9H)

TABLE C3 – Examples of herbicidal compounds of the present invention.

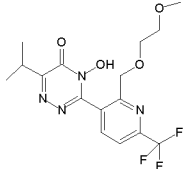
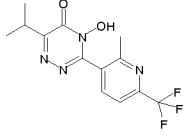
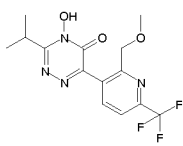
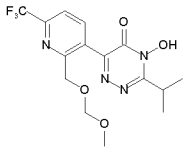
Compound Number	Structure	NMR
3.001		CDCl ₃ : ppm 8.00 (d, <i>J</i> =7.82 Hz, 1 H) 7.81 (d, <i>J</i> =7.83 Hz, 1 H) 4.84 (s, 2 H) 3.48 - 3.54 (m, 5 H) 3.45 (s, 3 H) 1.40 (d, <i>J</i> =7.34 Hz, 6 H)
3.002		CDCl ₃ : ppm 8.01 (d, <i>J</i> =7.83 Hz, 1 H) 7.70 (d, <i>J</i> =7.82 Hz, 1 H) 2.67 (s, 3H) 3.46 - 3.56 (m, 1 H) 1.42 (d, <i>J</i> =6.85 Hz, 6 H)

TABLE C4 – Examples of herbicidal compounds of the present invention.

Compound Number	Structure	NMR
4.001		CDCl ₃ : ppm 1.50 (d, J=6.80 Hz, 6 H) 3.09 (s, 3 H) 3.47 - 3.55 (m, 1 H) 4.88 (s, 2 H) 7.74 (d, J=7.97 Hz, 1 H) 8.10 (d, J=7.97 Hz, 1 H)
4.002		

Biological Examples

Seeds of a variety of test species are sown in standard soil in pots (*Alopecurus myosuroides* (ALOMY), *Setaria faberi* (SETFA), *Echinochloa crus-galli* (ECHCG), *Solanum nigrum* (SOLNI), *Amaranthus retroflexus* (AMARE), *Ipomoea hederacea* (IPOHE)). After cultivation for one day (pre-emergence) or after 8 days cultivation (post-emergence) under controlled conditions in a glasshouse (at 24/16°C, day/night; 14 hours light; 65 % humidity), the plants are sprayed with an aqueous spray solution derived from the formulation of the technical active ingredient in acetone / water (50:50) solution containing 0.5% Tween 20 (polyoxyethelyene sorbitan monolaurate, CAS RN 9005-64-5). Compounds are applied at 1000 g/h. The test plants are then grown in a glasshouse under controlled conditions in a glasshouse (at 24/16°C, day/night; 14 hours light; 65 % humidity) and watered twice daily. After 13 days for pre and post-emergence, the test is evaluated for the percentage herbicidal damage caused to the plant. The biological activities are shown in the following table on a five point scale (5 = 80-100% damage; 4 = 60-79% damage; 3 = 40-59% damage; 2 = 20-39% damage; 1 = 0-19% damage).

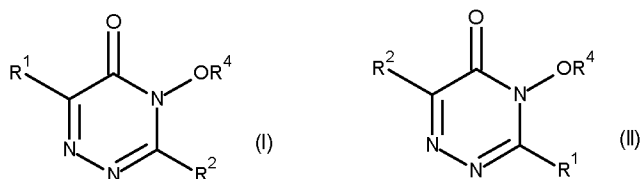
TABLE B1

Compound	POST Application						PRE Application					
	SOLNI	AMARE	SETFA	ALOMY	ECHCG	IPOHE	SOLNI	AMARE	SETFA	ALOMY	ECHCG	IPOHE
1.001	5	5	4	4	5	5	5	5	5	4	5	4
1.025	5	4	1	1	4	3	1	5	1	1	1	2
1.027	5	5	4	5	5	4	5	5	5	4	5	4
1.028	5	5	5	5	5	5	5	5	5	5	5	5
1.029	5	5	5	5	5	5	5	5	4	3	3	4
1.030	5	5	5	4	5	4	5	5	4	3	0	4
1.031	5	5	5	5	5	5	5	5	4	4	2	5
1.032	5	5	5	5	5	5	5	5	5	5	5	5
2.027	5	5	5	5	5	5	5	5	5	5	5	5
2.028	5	5	5	5	5	5	5	5	5	5	5	5
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2.049	5	5	5	5	5	5	5	5	5	5	5	5
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[illegible]

Claims

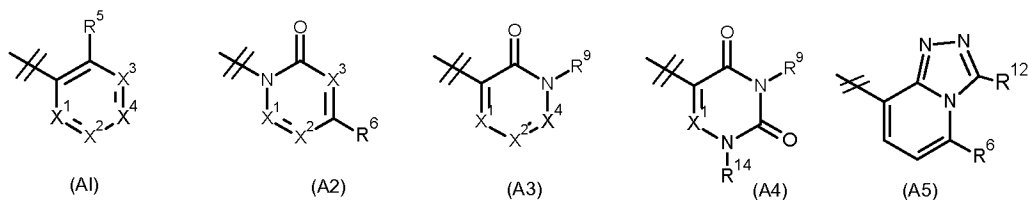
1. A compound of Formula (I) or Formula (II):



or an agronomically acceptable salt thereof,
wherein:-

- 10 R^1 is selected from the group consisting of hydrogen, C_1 - C_6 alkyl, C_3 - C_6 cycloalkyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, C_1 - C_6 haloalkyl, C_1 - C_6 alkoxy- C_1 - C_3 -alkyl and C_3 - C_6 cycloalkyl- C_1 - C_3 -alkyl;

R^2 is selected from the group consisting of A1, A2, A3, A4 and A5



wherein

- 20 X^1 is N or CR^7 ;

X^2 is N or CR^8 ;

X^3 is N or CR^9 ;

25

X^4 is N or CR^6 ;

5 R^4 is selected from the group consisting of hydrogen, C_1 - C_6 alkyl, C_1 - C_6 cycloalkyl, C_1 - C_6 haloalkyl, C_2 - C_6 alkenyl, C_2 - C_6 haloalkenyl, C_2 - C_6 alkynyl, C_1 - C_6 alkylcarbonyl-, aryl-, arylcarbonyl-, C_1 - C_6 alkoxycarbonyl-, C_1 - C_6 alkoxycarbonyl-oxy- C_1 - C_6 alkyl-, C_1 - C_6 alkyl-S(O)_p-, C_1 - C_6 alkyl-S(O)_pcarbonyl- and aryl-S(O)_p-, wherein said aryl groups may be optionally substituted by one or more R^{11} ;

10 R^5 is selected from the group consisting of hydroxyl, halogen, C_1 - C_6 alkyl, C_1 - C_6 cycloalkyl, C_1 - C_6 haloalkyl, C_2 - C_6 alkenyl, C_2 - C_6 haloalkenyl, C_2 - C_6 alkynyl, C_1 - C_6 alkoxy-, C_2 - C_6 alkenyloxy-, C_3 - C_6 cycloalkyl- C_1 - C_3 -alkyl-, C_1 - C_6 alkoxy- C_1 - C_3 -alkyl-, C_1 - C_6 alkoxy- C_2 - C_6 alkoxy-, C_1 - C_6 alkoxy- C_2 - C_6 alkoxy- C_1 - C_3 -alkyl-, C_1 - C_6 haloalkoxy-, C_1 - C_6 haloalkoxy- C_1 - C_3 -alkyl-, C_1 - C_6 alkyl-S(O)_p-, C_1 - C_6 haloalkyl-S(O)_p-, aryl, aryl-S(O)_p-, heterocyclyl, heterocyclyl-S(O)_p-, aryloxy-, aryl- C_2 - C_6 alkyl-, aryl- C_1 - C_6 alkoxy-, heterocyclyloxy-,
15 heterocyclyl- C_1 - C_3 alkoxy- C_1 - C_3 -alkyl-, hydroxycarbonyl, hydroxycarbonyl- C_1 - C_3 alkoxy-, C_1 - C_3 alkoxycarbonyl-, C_1 - C_3 alkoxycarbonyl- C_1 - C_3 alkoxy-, C_1 - C_3 alkylamino-, C_1 - C_3 dialkylamino-, C_1 - C_3 alkylamino-S(O)_p-, C_1 - C_3 alkylamino-S(O)_p- C_1 - C_3 -alkyl-, C_1 - C_3 dialkylamino-S(O)_p-, C_1 - C_3 dialkylamino-S(O)_p- C_1 - C_3 -alkyl-, C_1 - C_3 alkylaminocarbonyl-, C_1 - C_3 alkylaminocarbonyl- C_1 - C_3 -alkyl-, C_1 - C_3 dialkylaminocarbonyl-, C_1 - C_3 dialkylaminocarbonyl- C_1 - C_3 -alkyl-, C_1 - C_3 alkylcarbonylamino-, C_1 - C_3 alkyl-S(O)_p-amino-, C_1 - C_3 alkyl-S(O)_p- C_1 - C_3 alkylamino-, C_1 - C_3 alkyl-S(O)_p-amino- C_1 - C_3 -alkyl-, cyano and nitro, wherein said heterocyclyls are five or six membered heterocyclyls containing from one to three heteroatoms each
20 independently selected from the group consisting of oxygen, nitrogen and sulphur, and wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of halo, C_1 - C_3 alkyl, C_1 - C_3 haloalkyl, C_1 - C_3 alkoxy, C_1 - C_3 haloalkoxy, C_1 - C_6 alkyl-S(O)_p-, phenyl, cyano and nitro;

30

R^6 and R^9 are independently selected from the group consisting of hydrogen, hydroxyl, halogen, C_1 - C_6 alkyl, C_1 - C_6 cycloalkyl, C_1 - C_6 haloalkyl, C_2 - C_6 alkenyl, C_2 - C_6 haloalkenyl, C_2 - C_6 alkynyl, C_1 - C_6 alkoxy-, C_2 - C_6 alkenyloxy-, C_3 -

C₆cycloalkyl-C₁-C₃-alkyl-, C₁-C₆alkoxy-C₁-C₃alkyl-, C₁-C₆alkoxy-C₂-C₆alkoxy-, C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl-, C₁-C₆haloalkoxy-, C₁-C₆haloalkoxy-C₁-C₃alkyl-, C₁-C₆alkyl-S(O)_p-, C₁-C₆haloalkyl-S(O)_p-, aryl, aryl-S(O)_p-, heterocyclyl, heterocyclyl-S(O)_p-, aryloxy-, aryl-C₂-C₆alkyl-, aryl-C₁-C₆alkoxy-, heterocyclyloxy-, heterocyclyl-C₁-C₃alkoxy-C₁-C₃alkyl-, hydroxycarbonyl, hydroxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkoxycarbonyl-, C₁-C₃alkoxycarbonyl-C₁-C₃alkoxy-, C₁-C₃alkylamino-, C₁-C₃dialkylamino-, C₁-C₃alkylamino-S(O)_p-, C₁-C₃alkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃dialkylamino-S(O)_p-, C₁-C₃dialkylamino-S(O)_p-C₁-C₃alkyl-, C₁-C₃alkylaminocarbonyl-, C₁-C₃alkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃dialkylaminocarbonyl-, C₁-C₃dialkylaminocarbonyl-C₁-C₃alkyl-, C₁-C₃alkylcarbonylamino-, C₁-C₃alkyl-S(O)_p-amino-, C₁-C₃alkyl-S(O)_p-C₁-C₃alkylamino-, C₁-C₃alkyl-S(O)_p-aminoC₁-C₃alkyl-, cyano and nitro, wherein said heterocyclyls are five or six membered heterocyclyls containing from one to three heteroatoms each independently selected from the group consisting of oxygen, nitrogen and sulphur, and wherein the aryl or heterocyclyl components may be optionally substituted by one or more substituents selected from the group consisting of halo, C₁-C₃alkyl, C₁-C₃haloalkyl, C₁-C₃alkoxy, C₁-C₃haloalkoxy, C₁-C₆alkyl-S(O)_p-, phenyl, cyano and nitro;

R⁷ and R⁸ are independently selected from the group consisting of hydrogen, halogen, C₁-C₃alkyl-, C₁-C₃alkoxy-, C₂-C₃alkenyl-, C₂-C₃alkynyl-, C₁-C₃haloalkyl- and C₁-C₃haloalkoxy-;

and wherein R⁵ and R⁹ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more nitrogen and/or oxygen heteroatoms, the 5- or 6-membered ring being optionally substituted by one or more R¹²; or

R⁶ and R⁹ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more heteroatoms selected from the group consisting of nitrogen, oxygen and

S(O)₂, the 5- or 6-membered ring being optionally substituted by one or more R¹²; or

5 R⁶ and R⁸ can together form a saturated or unsaturated 5- or 6-membered carbocyclic or heterocyclic ring, said heterocyclic ring comprising one or more nitrogen heteroatoms, the 5- or 6-membered ring being optionally substituted by one or more R¹³; and

10 R¹¹ is selected from the group consisting of halo-, C₁-C₃alkyl, C₁-C₃ haloalkyl and C₁-C₆alkoxy;

15 R¹² is selected from the group of hydrogen, cyano, halo-, oxy-, C₁-C₃alkylS(O)p-, C₁-C₃ alkyl, C₃-C₆cycloalkyl-, C₂-C₃alkenyl, C₂-C₃alkynyl, C₁-C₃ alkoxy and C₁-C₃ haloalkyl;

R¹³ is selected from the group of hydrogen, cyano, halo-, C₁-C₃alkylS(O)p-, C₁-C₃ alkyl, C₂-C₃alkenyl, C₂-C₃alkynyl, morpholinyl- and C₁-C₃ haloalkyl;

20 R¹⁴ is selected from the group consisting of hydrogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy-C₁-C₆alkyl, C₁-C₆haloalkoxy-C₁-C₆alkyl, C₁-C₆alkoxy-C₁-C₆alkoxy-C₁-C₆alkyl, C₁-C₆alkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₂-C₆haloalkynyl and C₃-C₆ cycloalkyl;

and

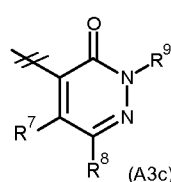
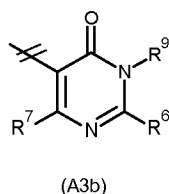
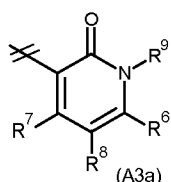
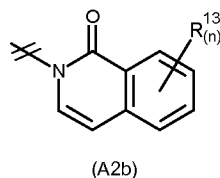
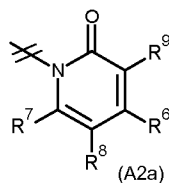
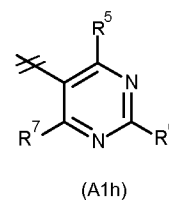
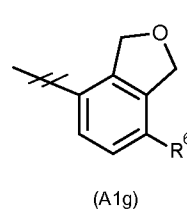
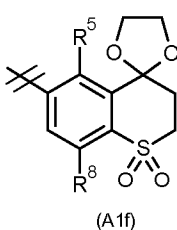
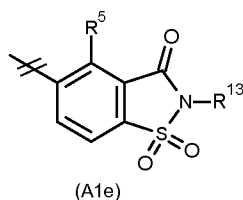
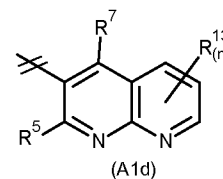
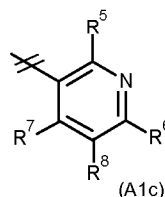
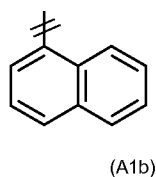
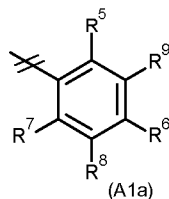
25 p = 0, 1 or 2

with the exception of compounds of Formula (II) wherein R² = (A1), R⁴ = hydrogen, R⁵ = halogen, X¹ = CH, X² = CH, X³ = CH and X⁴ = -C-CN.

30

2. A compound according to claim 1, wherein R¹ is selected from the group consisting of hydrogen, C₁-C₆alkyl, C₃-C₆cycloalkyl, C₁-C₆alkoxy-, C₃-C₆cycloalkyl- C₃-C₆alkyl-.

3. A compound according to claim 1 or claim 2, wherein R^2 is selected from the group consisting of A1a, A1b, A1c, A1d, A1e, A1f, A1g, A1h, A2a, A2b, A3a, A3b and A3c:



5

wherein R^5 , R^6 , R^7 , R^8 , R^9 , R^{12} and R^{13} are as defined previously and n is 0, 1, 2 or 3.

4. A compound according to claim 3, wherein R^2 is A1a.

10

5. A compound according to any one of the previous claims, wherein R^5 is selected from the group consisting of, halogen, C_1 - C_6 alkyl, C_1 - C_6 haloalkyl, C_1 - C_6 alkoxy- C_1 - C_3 alkyl-, C_1 - C_6 alkoxy- C_2 - C_6 alkoxy- C_1 - C_3 alkyl-, C_1 - C_6 alkyl- $S(O)_p$ - and nitro.

15

6. A compound according to claim 5, wherein R⁵ is selected from the group consisting of chloro, fluoro, bromo, methyl, methoxymethyl, methoxyethoxymethyl-, methylS(O)_p- and nitro.
- 5 7. A compound according to any one of the previous claims, wherein R⁶ is selected from the group consisting of hydrogen, halogen, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkyl-S(O)_p-, C₂-C₆alkenyl and C₂-C₆alkynyl.
8. A compound according to any one of the previous claims, wherein R⁷ and R⁸
10 are independently selected from the group consisting of hydrogen, halogen and C₁-C₃alkyl-.
9. A compound according to any one of the previous claims, wherein R⁹ is selected from the group consisting of hydrogen, isoxazoliny, C₁-
15 C₆haloalkoxy-C₁-C₃alkyl- and C₁-C₆alkoxy-C₂-C₆alkoxy-C₁-C₃alkyl-.
10. A herbicidal composition comprising a herbicidal compound according to any one of the previous claims and an agriculturally acceptable formulation adjuvant.
20
11. A herbicidal composition according to claim 10, further comprising at least one additional pesticide.
12. A herbicidal composition according to claim 11, wherein the additional
25 pesticide is a herbicide or herbicide safener.
13. A method of controlling weeds at a locus comprising application to the locus of a weed controlling amount of a composition according to any one of claims 10 to 12.
30
14. Use of a compound of Formula (I) of Formula (II) as defined in claim 1 as a herbicide.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/056213

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D401/04 C07D413/10 C07D471/04 C07D253/06 A01N43/707
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C07D A01N

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

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

EPO-Internal, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 21 38 031 A1 (BAYER AG) 8 February 1973 (1973-02-08) page 1, 1st paragraph; page 14, last compound -----	1-6, 10-14



Further documents are listed in the continuation of Box C.



See patent family annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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"P" document published prior to the international filing date but later than the priority date claimed

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

2 May 2014

Date of mailing of the international search report

09/05/2014

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2014/056213

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 2138031	A1	08-02-1973	
		BE 786840 A1	29-01-1973
		CH 582682 A5	15-12-1976
		CS 167996 B2	28-05-1976
		DD 110043 A5	05-12-1974
		DD 112072 A5	20-03-1975
		DE 2138031 A1	08-02-1973
		FR 2147748 A5	09-03-1973
		GB 1357852 A	26-06-1974
		HU 164712 B	11-04-1974
		IL 40005 A	31-10-1976
		IT 963443 B	10-01-1974
		JP S5626666 B1	19-06-1981
		JP S5654284 B1	24-12-1981
		NL 7210467 A	31-01-1973
		PL 89679 B1	31-12-1976
		RO 62510 A1	15-02-1978
		RO 62702 A1	15-10-1978
		SU 433681 A3	25-06-1974
		US 3910909 A	07-10-1975
