

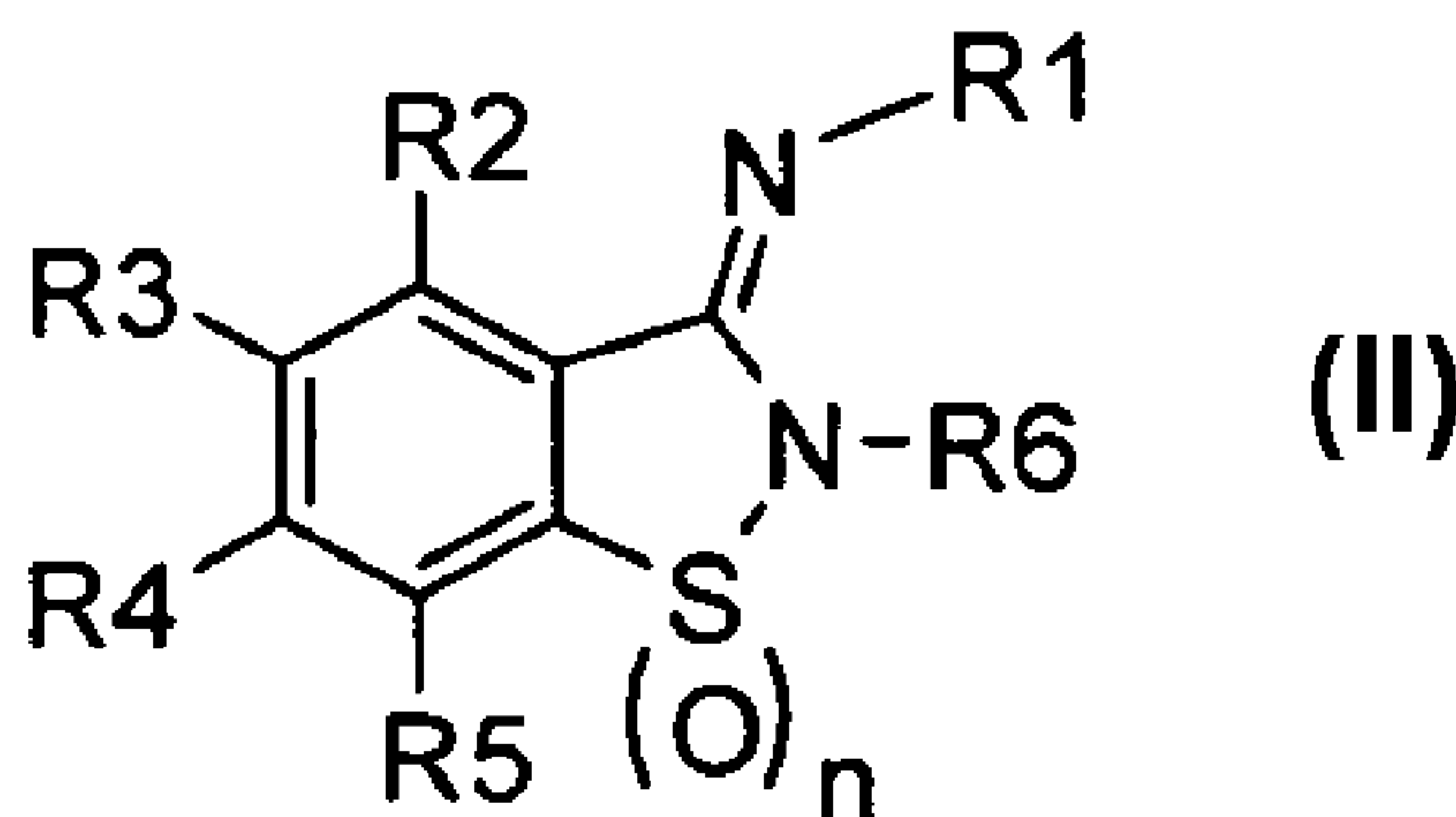
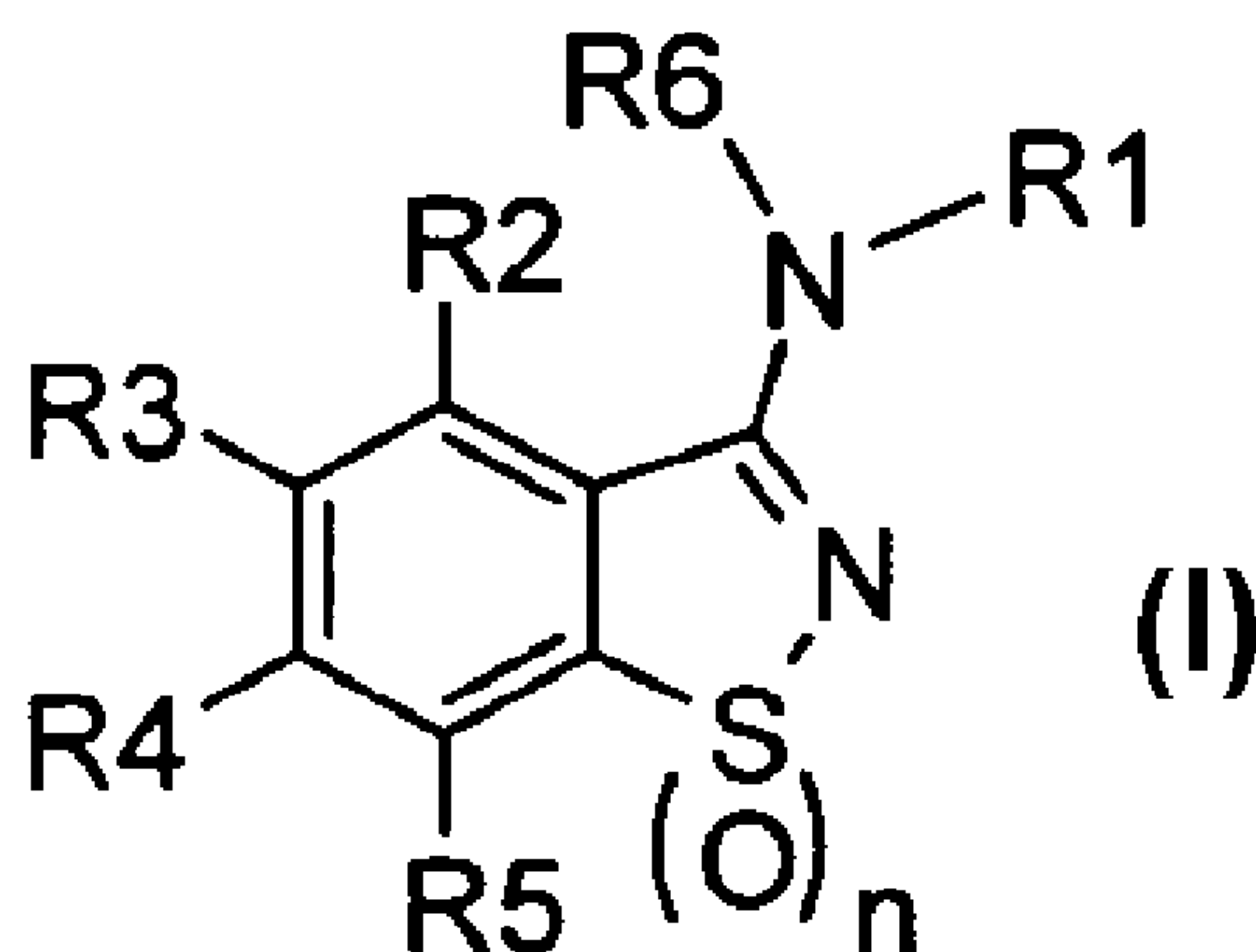


(86) Date de dépôt PCT/PCT Filing Date: 2008/05/15
(87) Date publication PCT/PCT Publication Date: 2008/12/04
(85) Entrée phase nationale/National Entry: 2009/11/17
(86) N° demande PCT/PCT Application No.: EP 2008/003885
(87) N° publication PCT/PCT Publication No.: 2008/145261
(30) Priorités/Priorities: 2007/05/31 (EP07010768.5);
2007/07/19 (EP07014175.9)

(51) Cl.Int./Int.Cl. *A01N 43/80* (2006.01)
(71) Demandeur/Applicant:
SYNGENTA PARTICIPATIONS AG, CH
(72) Inventeurs/Inventors:
RENOLD, PETER, CH;
HUETER, OTTMAR FRANZ, CH;
MAIENFISCH, PETER, CH;
ZAMBACH, WERNER, CH;
PITTERNA, THOMAS, CH;
GRIMM, CHRISTOPH, CH
(74) Agent: FETHERSTONHAUGH & CO.

(54) Titre : PROCEDE DE PROTECTION D'UNE MATIERE DE PROPAGATION VEGETALE, D'UN VEGETAL ET/OU D'ORGANES VEGETAUX

(54) Title: A METHOD OF PROTECTING A PLANT PROPAGATION MATERIAL, A PLANT, AND/OR PLANT ORGANS



and

(57) **Abrégé/Abstract:**

A method of controlling or preventing pest damage in a plant propagation material, a plant, and/or plant organs that grow at a later point in time, which comprises applying on the plant propagation material or locus thereof a compound I or II represented by formula (I) and (II) wherein R1 is represented, for example, by H; R6 is represented, for example, by H; R2 is represented, for example, by halogen; R3 to R5 is represented, for example, by H; and n is either 0 or 2; or an enantiomer, diastereomer, or salt, thereof.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 December 2008 (04.12.2008)

PCT

(10) International Publication Number
WO 2008/145261 A1

(51) International Patent Classification:
A01N 43/80 (2006.01)

(21) International Application Number:
PCT/EP2008/003885

(22) International Filing Date: 15 May 2008 (15.05.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
07010768.5 31 May 2007 (31.05.2007) EP
07014175.9 19 July 2007 (19.07.2007) EP

(71) Applicant (for all designated States except US): **SYNGENTA PARTICIPATIONS AG** [CH/CH]; Schwarzwaldallee 215, CH-4058 Basel (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RENOLD, Peter** [CH/CH]; Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH). **HUETER, Ottmar, Franz** [CH/CH]; Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH). **MAIENFISCH, Peter** [CH/CH]; Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH). **ZAMBACH, Werner** [CH/CH]; Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH). **PITTERNA, Thomas** [CH/CH];

Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH). **GRIMM, Christoph** [CH/CH]; Syngenta Crop Protection Münchwilen AG, Schaffhauserstrasse, CH-4332 Stein (CH).

(74) Agent: **ARUNASALAM, Velautha-Cumaran**; Syngenta Crop Protection Münchwilen AG, Intellectual Property, Schaffhauserstrasse, CH-4332 Stein (CH).

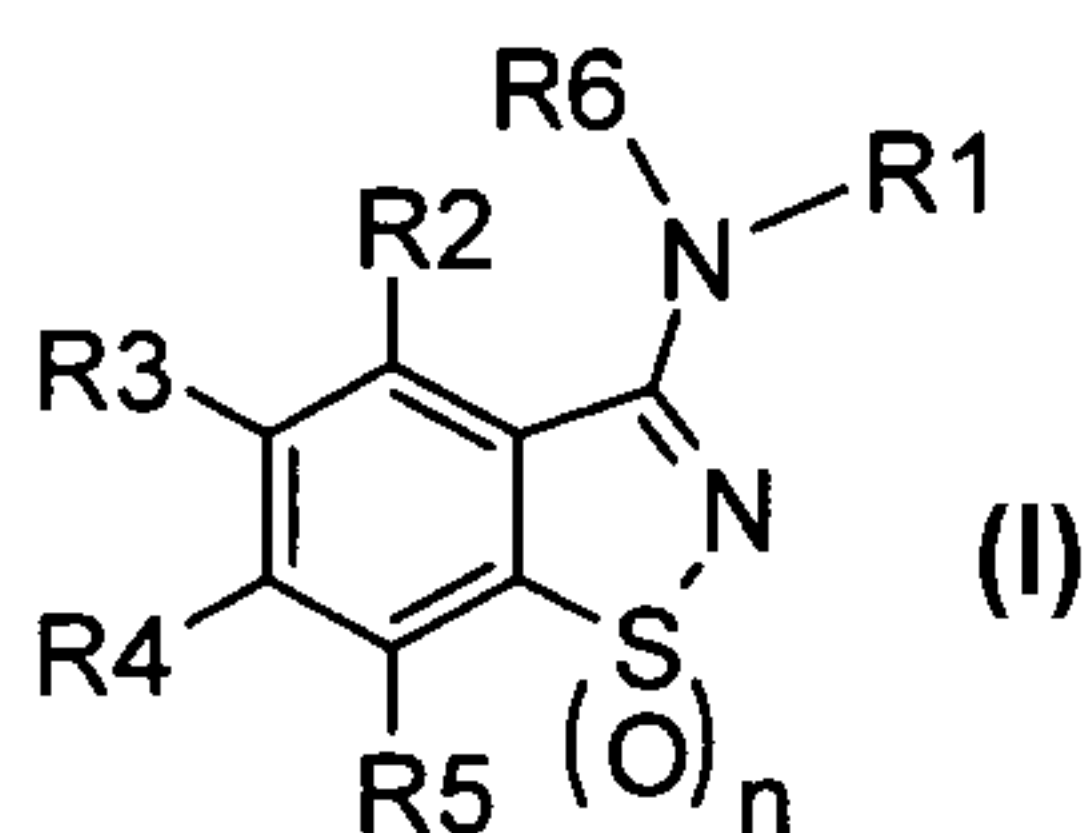
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM,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

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

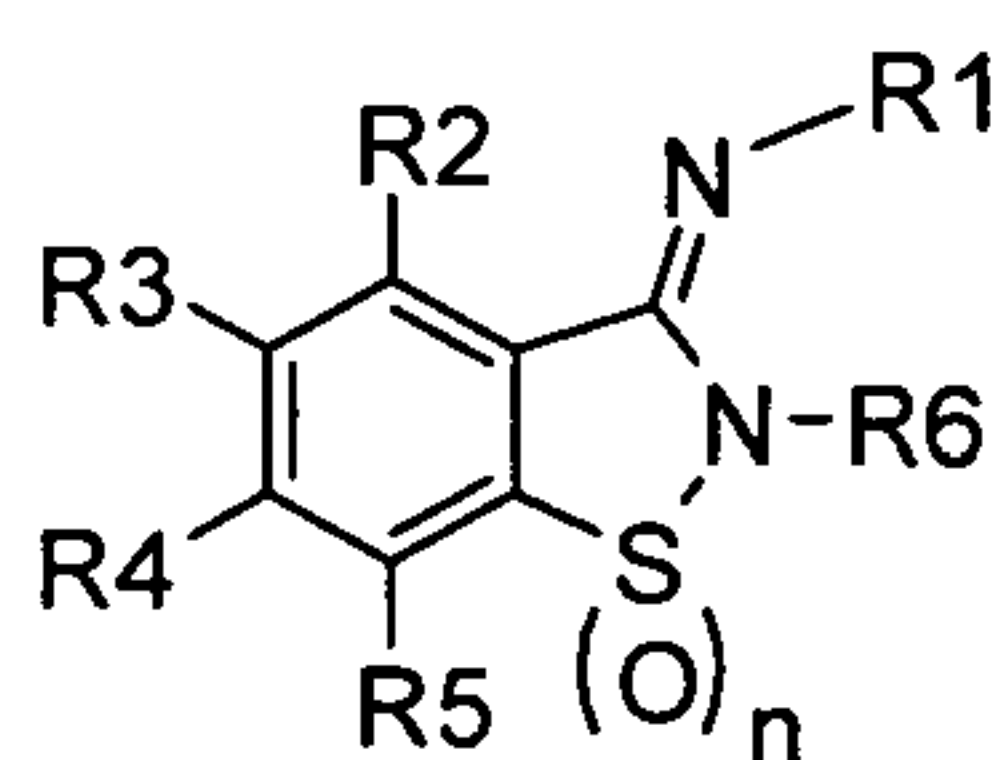
Published:

— with international search report

(54) Title: A METHOD OF PROTECTING A PLANT PROPAGATION MATERIAL, A PLANT, AND/OR PLANT ORGANS



(I)



(II)

and

(57) Abstract: A method of controlling or preventing pest damage in a plant propagation material, a plant, and/or plant organs that grow at a later point in time, which comprises applying on the plant propagation material or locus thereof a compound I or II represented by formula (I) and (II) wherein R1 is represented, for example, by H; R6 is represented, for example, by H; R2 is represented, for example, by halogen; R3 to R5 is represented, for example, by H; and n is either 0 or 2; or an enantiomer, diastereomer, or salt, thereof.

A METHOD OF PROTECTING A PLANT PROPAGATION MATERIAL, A PLANT, AND/OR
PLANT ORGANS

The present invention relates to a method for using a defined compound in the control or prevention of pest damage, in particular in a plant propagation material and plant organs that grow at a later point in time by applying the compound on to the plant propagation material or locus thereof, a plant propagation material composition thereof and a pesticidal combination of such a compound with one or more certain pesticides.

The treatment of plant propagation material is a targeted pesticide application which addresses the need for a reduction of environmental and worker exposure compared to foliar or soil pesticide applications.

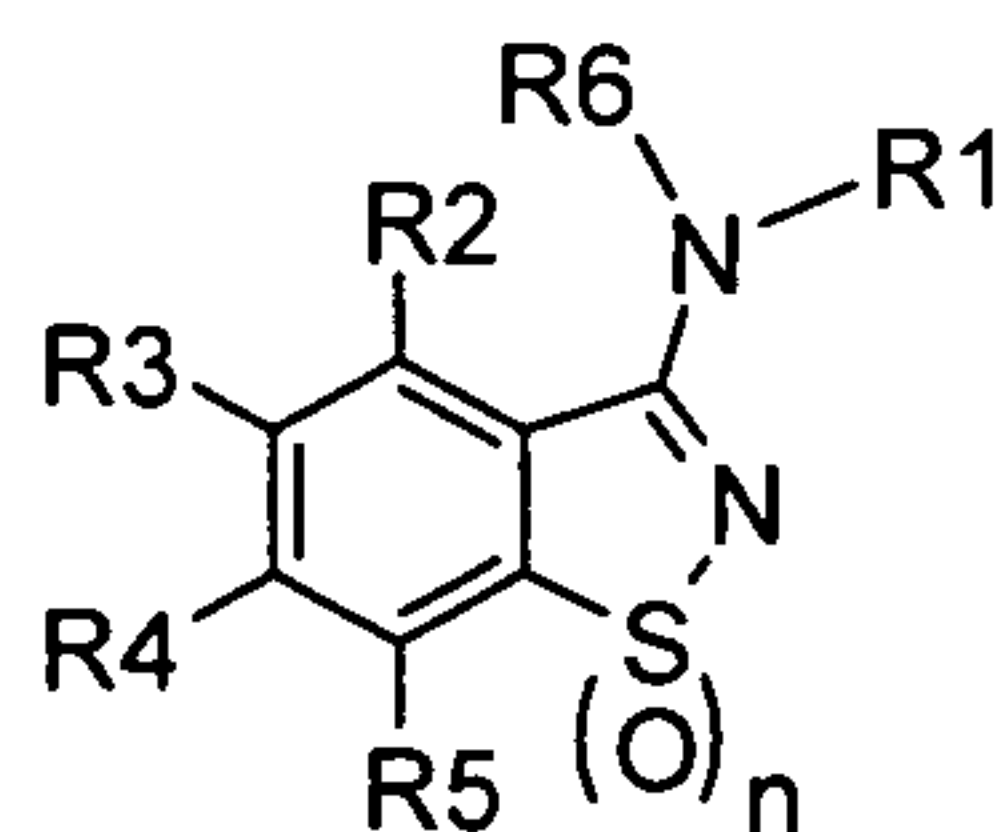
Pesticidal active ingredients and combinations thereof for controlling pathogens and pests in plant propagation materials and plant organs that grow at a later point in time are described in the literature. The biological properties of those known compounds and combinations are not entirely satisfactory in the areas of pest control, phytotoxicity, and environmental and worker exposure, for example. In particular, in the instance a pest has become, or risks becoming resistant to the previously known combinations, improved methods of control or prevention are sought.

There is a continuing need to provide pesticidal compositions, which provide improved, for example, biological properties, especially for controlling pathogens and/or pests.

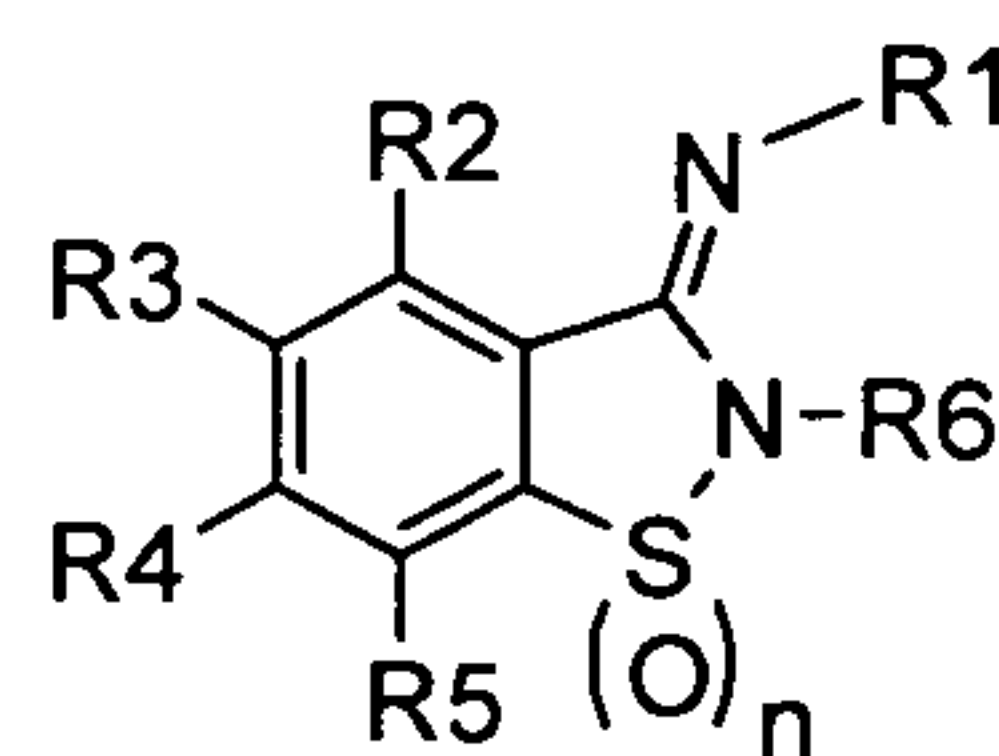
Sulfonyl compounds, in particular benzoisothiazol-S,S-dioxides are known. It has now been found that a certain compounds have unexpectedly good activity when applied onto a plant propagation material or locus thereof. In particular for the control of pests, such as animal pests, particularly those found in agriculture.

Accordingly, in a first aspect, the present invention provides a method of controlling or preventing pest damage in a plant propagation material, a plant, and/or plant organs that grow at a later point in time, which comprises applying on the plant propagation material or locus thereof a compound I or II represented by formula

-2-



I, and



II

wherein

- 5 R1 is H and R6 is represented by (C₁-C₄)alkyl or (C₂-C₄)alkenyl, or R1 is H, (C₁-C₅)alkyl, (C₁-C₄)haloalkyl, (C₁-C₄)hydroxyalkyl, (C₁-C₄)alkoxy, R₇C(O), R₈NHC(O) or R₉R₁₀N and R6 is represented by H or R₇C(O);
- R2 is represented by H, halogen, (C₁-C₅)alkyl, (C₁-C₅)haloalkyl, (C₁-C₅)alkoxy, (C₁-C₅)haloalkoxy, or phenoxy;
- 10 R3 to R5 is, independently of each other, represented by H, halogen, (C₁-C₅)alkyl, (C₁-C₅)alkoxy, (C₁-C₅)haloalkyl, or NO₂;
- R₇ is represented by optionally substituted alkyl (preferably (C₁-C₅)alkyl and (C₁-C₅)haloalkyl), (C₁-C₄)haloalkoxy(C₁-C₄)haloalkyl or optionally substituted phenyl;
- R₈ is represented by optionally substituted phenyl, (C₁-C₄)alkyl, or (C₃-C₇)cycloalkyl;
- 15 R₉ and R₁₀ is, independently of each other, represented by H or (C₁-C₄)alkyl; and
- n is either 0 or 2, preferably 2; provided that when R1 and R6 are each R₇C(O), R2 is a halogen;
- or an enantiomer, diastereomer, or salt, thereof.
- 20 In a second aspect, the present invention provides a method of protecting a plant propagation material, a plant, part of a plant and/or plant organs that grow at a later point in time against pest damage by applying to the plant propagation material or locus thereof a compound defined in the first aspect.
- 25 The invention also relates to a plant propagation material treated with the compound defined in the first aspect.

The present invention also relates to a method which comprises (i) treating a plant propagation material, such as a seed, with a compound as defined in the first aspect, and (ii)

30 planting or sowing the treated propagation material, wherein the compound protects against

-3-

pest damage of the treated plant propagation material, parts of plant, plant organs and/or plant grown from the treated propagation material.

Further, the present invention concerns a method which comprises (i) treating a plant propagation material, such as a seed, with a compound as defined in the first aspect, and (ii) planting or sowing the treated propagation material, and (iii) achieving protection against pest damage of the treated plant propagation material, parts of plant, plant organs and/or plant grown from the treated propagation material.

10 In an embodiment of any aspect of the invention, a stereoisomeric or diastereomeric mixture of compound I or II is applied on the plant propagation material or locus thereof. In a further embodiment, a mixture of compound I and II is applied on the plant propagation material or locus thereof.

15 In each embodiment of the present invention, the application of the compound defined in the first aspect is to a plant propagation material and also to the locus thereof.

According to the instant invention, a "stereoisomeric or diastereomeric mixture" of two stereoisomers or diastereomers or a "stereoisomeric or diastereomeric compound" means a mixture of any two stereoisomers or diastereomers in a ratio from 1:10 to 10:1, preferably 1:5 to 5:1.

Similarly, a mixture of compound I and II is preferably in a ratio from 1:10 to 10:1, preferably 1:5 to 5:1.

25

In a further aspect of the invention, the compound of formula I or II is present in the form of a plant propagation material, preferably seed, treatment composition, wherein the composition optionally further comprises one or more customary formulation auxiliaries.

30 The compounds of formula (I) or (II) may exist in different geometric or optical isomers or tautomeric forms. This invention covers all such isomers and tautomers and mixtures thereof in all proportions. In particular, in the case compounds of the formula I have one or more centers of chirality, they can be present as mixtures of enantiomers or diastereomers.

-4-

Salts of the compounds formulae I or II can be agriculturally acceptable salts.

They can be formed in a customary method, e.g. by reacting the compound with an acid of the anion in question if the compound has a basic functionality or by reacting an acidic compound with a suitable base. Suitable agriculturally useful salts are especially the salts

5 of those cations or the acid addition salts of those acids whose cations and anions, respectively, do not have any adverse effect on the action of the compounds according to the present invention. Suitable agriculturally useful salts are especially the salts of those cations or the acid addition salts of those acids whose cations and anions, respectively, do not have any adverse effect on the action of the compounds according to the present

10 invention, which are useful for combating harmful insects, arachnids and/or nematodes.

Thus, suitable cations are in particular the ions of the alkali metals, preferably lithium, sodium and potassium, of the alkaline earth metals, preferably calcium, magnesium and barium, and of the transition metals, preferably manganese, copper, zinc and iron, and also the ammonium ion which may, if desired, carry one to four C1-C4-alkyl substituents and/or

15 one phenyl or benzyl substituent, preferably diisopropylammonium, tetramethylammonium, tetrabutylammonium, trimethylbenzylammonium, furthermore phosphonium ions, sulfonium ions, preferably tri(C1-C4-alkyl) sulfonium, and sulfoxonium ions, preferably tri (C1-C4- alkyl) sulfoxonium. Anions of useful acid addition salts are primarily chloride, bromide, fluoride,

hydrogen sulfate, sulfate, dihydrogen phosphate, hydride, hydroxide, hydrogen phosphate, phosphate, nitrate, hydrogen carbonate, carbonate, hexafluorosilicate,

20 hexafluorophosphate, benzoate, and the anions of C1-C4-alkanoic acids, preferably formate, acetate, propionate and butyrate. They can be formed by reacting the

compounds of the formula I with an acid of the corresponding anion, preferably of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid or nitric acid. Also

25 suitable salts include adducts of the formula I, such as maleic acid, dimaleic acid, fumaric acid, difumaric acid, and methane sulfonic acid.

"Halogen" is fluorine, chlorine, bromine and iodine, in particular fluorine and chlorine, and "halo" the corresponding substituent.

30 A group substituted with a halo substituent can have 1 to the maximum number of substituents possible for that group.

-5-

Each of alkyl, haloalkyl, alkoxy, haloalkoxy, alkenyl can be straight or branched. In the instance that the alkyl or phenyl group, independently of each other, on R7 and R8 is substituted, suitable substituents include halogen.

5 Preferably, independent of each other,

R1 is H and R6 is represented by (C₁-C₃)alkyl or (C₂-C₃)alkenyl, or R1 is H, (C₁-C₃)alkyl, (C₁-C₃)haloalkyl, (C₁-C₃)hydroxyalkyl, (C₁-C₄)alkoxy, R7C(O), R8NHC(O) or R9R10N and R6 is represented by H or R7C(O);

10 R2 is represented by hydrogen, halogen, (C₁-C₃)alkyl, (C₁-C₃)haloalkyl, (C₁-C₃)alkoxy, (C₁-C₃)haloalkoxy, or phenoxy;

R3 to R5 is, independently of each other, represented by H, halogen, (C₁-C₃)alkyl, (C₁-C₃)alkoxy, (C₁-C₃)haloalkyl, or NO₂;

R7 is represented by optionally substituted alkyl (preferably (C₁-C₃)alkyl), (C₁-C₃)haloalkoxy(C₁-C₃)haloalkyl or optionally substituted phenyl;

15 R8 is represented by optionally substituted phenyl, (C₁-C₃)alkyl, or (C₃-C₅)cycloalkyl;

R9 and R10 is, independently of each other, represented by H or (C₁-C₃)alkyl; and n is 2.

In an embodiment, R1 in formula I is represented by H or R7C(O).

20

In an embodiment, R6 in formula I is represented by H.

In an embodiment, R1 in formula II is represented by H.

25 In an embodiment, R6 in formula II is represented by (C₁-C₄)alkyl.

In an embodiment, R2, independent of formula I or II, is represented by H, (C₁-C₅)alkyl, (C₁-C₅)alkoxy, (C₁-C₅)haloalkoxy, or halogen. Preferably halogen is Cl or F; (C₁-C₅)alkyl is (C₁-C₃)alkyl, such as methyl; preferably (C₁-C₅)haloalkoxy is (C₁-C₃)haloalkoxy, such as OCHF₂; and preferably (C₁-C₅)alkoxy is (C₁-C₃)alkoxy, advantageously OCH₃.

30

In an embodiment, R2 in formula I is represented by H, or (C₁-C₅)alkyl. Preferably (C₁-C₅)alkyl is (C₁-C₃)alkyl, such as methyl.

-6-

In an embodiment, R2 in formula I is represented by halogen. Preferably halogen is Cl or F.

In an embodiment, R3 to R5, independent of formula I or II, is represented by H.

5 In an embodiment, R7 is represented by (C₁ to C₃)alkyl, preferably methyl.

In an embodiment, a compound of formula I is represented by R1 is H or R7C(O) and R6 is represented by H;

R2 is represented by hydrogen, halogen, (C₁-C₃)alkyl, (C₁-C₃)alkoxy, or (C₁-C₃)haloalkoxy;

10 R3 to R5 is represented by H;

R7 is represented by (C₁-C₃)alkyl; and

n is 2.

In an embodiment, a compound of formula II is represented by R1 is H and R6 is represented

15 by (C₁-C₃)alkyl;

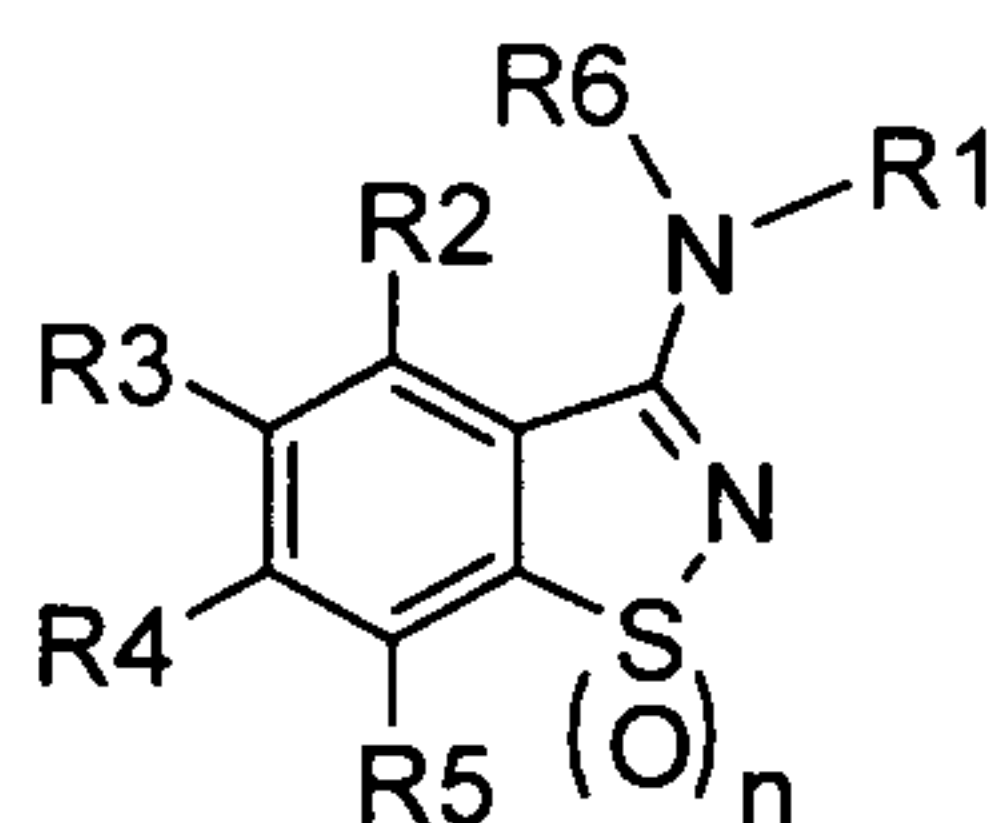
R2 is represented by halogen, or (C₁-C₃)alkyl;

R3 to R5 is represented by H; and

n is 2.

20 Examples of preferred compounds I and II are illustrated in Table 1, 2 and 3:

Table 1 : A compound of formula (I)



(I)

wherein n = 2 and the values for R₁, R₂, R₃, R₄, R₅ and R₆ are as given in the Table:

Line	R ₁	R ₆	R ₂	R ₃	R ₄	R ₅
P1. 1	H	H	OCH ₃	H	H	H
P1. 2	H	H	OCHF ₂	H	H	H
P1. 3	CH ₃ C(=O)	H	OCHF ₂	H	H	H

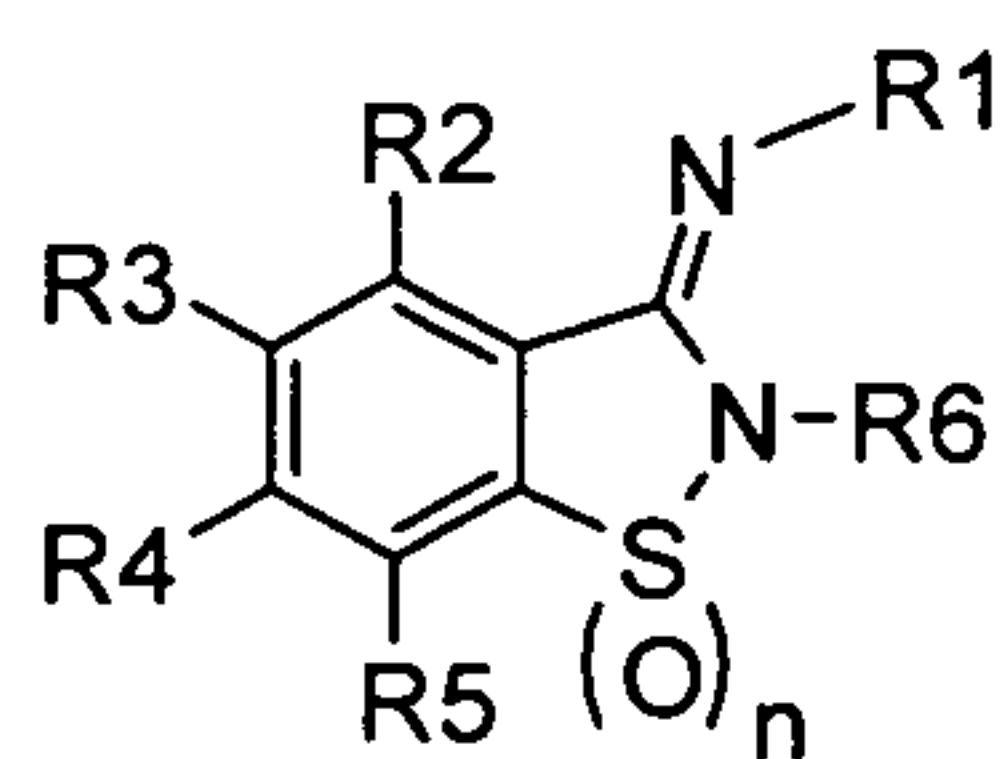
-7-

Line	R ₁	R ₆	R ₂	R ₃	R ₄	R ₅
P1. 4	CH ₃ CH ₂ C(=O)	H	OCHF ₂	H	H	H
P1. 5	H	H	Cl	H	H	H
P1. 6	H	H	F	H	H	H
P1. 7	H	H	CH ₃	H	H	H
P1. 8	CH ₃ C(=O)	H	OCH ₃	H	H	H
P1. 9	H	H	OPh	H	H	H
P1. 10	C ₆ H ₁₁ -NH-C(=O)	H	Cl	H	H	H
P1. 11	Cl-CH ₂ -CH ₂	H	Cl	H	H	H
P1. 12	CH ₃ -NH-C(=O)	H	Cl	H	H	H
P1. 13	CH ₃ -CH ₂ -CH ₂ -CH ₂	H	Cl	H	H	H
P1. 14	OH-CH ₂ -CH(Et)	H	Cl	H	H	H
P1. 15	(CH ₃) ₂ N-	H	Cl	H	H	H
P1. 16	CH ₃ C(=O)	CH ₃ C(=O)	Cl	H	H	H
P1. 17	CH ₃ CH ₂ C(=O)	CH ₃ CH ₂ C(=O)	Cl	H	H	H
P1. 18	CH ₃ CH ₂ CH ₂ C(=O)	CH ₃ CH ₂ CH ₂ C(=O)	Cl	H	H	H
P1. 19	Cl-CH ₂ -C(=O)	Cl-CH ₂ -C(=O)	Cl	H	H	H
P1. 20	CH ₃ C(=O)	CH ₃ C(=O)	F	H	H	H
P1. 21	Cl-CH ₂ -C(=O)	H	H	H	H	H
P1. 22	CH ₃ C(=O)	H	H	H	H	H
P1. 23	CH ₃ CH ₂ C(=O)	H	H	H	H	H
P1. 24	CH ₃ CH ₂ CH ₂ C(=O)	H	H	H	H	H
P1. 25	n-C ₅ H ₁₁ C(=O)	H	H	H	H	H
P1. 26	(CH ₃) ₂ CHC(=O)	H	H	H	H	H
P1. 27	CF ₃ C(=O)	H	H	H	H	H
P1. 28	CF ₃ CF ₂ C(=O)	H	H	H	H	H
P1. 29	CF ₃ CF ₂ CF ₂ C(=O)	H	H	H	H	H

-8-

Line	R ₁	R ₆	R ₂	R ₃	R ₄	R ₅
P1. 30	CCl ₃ C(=O)	H	H	H	H	H
P1. 31	PhC(=O)	H	H	H	H	H
P1. 32	CH ₃ C(=O)	H	Cl	H	H	H
P1. 33	CH ₃ CH ₂ C(=O)	H	Cl	H	H	H
P1. 34	PhC(=O)	H	Cl	H	H	H
P1. 35	Cl-CH ₂ -C(=O)	H	Cl	H	H	H
P1. 36	CH ₃ CH ₂ CH ₂ C(=O)	H	Cl	H	H	H
P1. 37	(CH ₃) ₂ CHC(=O)	H	Cl	H	H	H
P1. 38	n-C ₅ H ₁₁ C(=O)	H	Cl	H	H	H
P1. 39	CF ₃ C(=O)	H	Cl	H	H	H
P1. 40	CF ₃ CF ₂ C(=O)	H	Cl	H	H	H
P1. 41	CF ₃ CF ₂ CF ₂ C(=O)	H	Cl	H	H	H
P1. 42	CCl ₃ C(=O)	H	Cl	H	H	H
P1. 43	CH ₃ C(=O)	H	Cl	Br	H	H
P1. 44	CH ₃ CH ₂ C(=O)	H	Cl	Br	H	H
P1. 45	CH ₃ C(=O)	H	H	CH ₃	H	H
P1. 46	CH ₃ CH ₂ C(=O)	H	Cl	H	H	Cl
P1. 47	CH ₃ C(=O)	H	Cl	H	H	Cl
P1. 48	CH ₃ C(=O)	H	H	H	Cl	H
P1. 49	CH ₃ C(=O)	H	H	H	H	Cl
P1. 50	CH ₃ C(=O)	H	CH ₃	H	H	H
P1. 51	CH ₃ C(=O)	H	F	H	H	H
P1. 52	CH ₃ C(=O)	H	H	Cl	H	OCH ₃
P1. 53	CH ₃ C(=O)	H	Cl	H	H	NO ₂
P1. 54	CH ₃ C(=O)	H	CH ₃	H	CH ₃	CH ₃

-9-

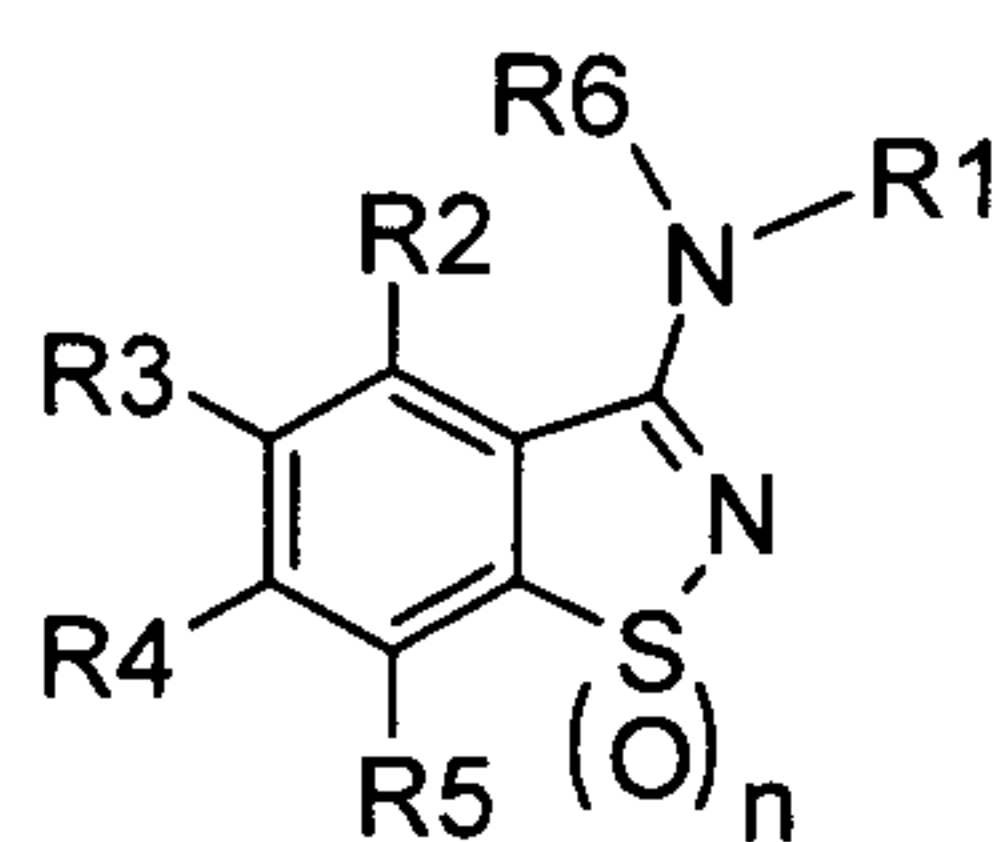
Table 2 : A compound of formula (II)

(II)

wherein $n = 2$, $R_3 = H$, $R_4 = H$, $R_5 = H$ and the values for R_1 , R_2 and R_6 are as given in the Table:

Line	R_1	R_6	R_2
P2. 1	H	CH ₃	Cl
P2. 2	H	CH ₃	F
P2. 3	H	CH ₃	OCH ₃
P2. 4	H	CH ₃ CH ₂	F
P2. 5	H	CH ₂ =CHCH ₂	Cl
P2. 6	H	CH ₂ =CHCH ₂	F
P2. 7	H	CH ₃	CH ₃

5

Table 3 : A compound of formula (I)

(I)

wherein $n = 0$, $R_3 = H$, $R_4 = H$ and the values for R_1 , R_2 , R_5 and R_6 are as given in the Table:

Line	R_1	R_6	R_2	R_5
P3. 1	H	H	H	H
P3. 2	CH ₃ C(=O)	CH ₃ C(=O)	Cl	H
P3. 3	CH ₃ C(=O)	H	Cl	NO ₂

-10-

Line	R ₁	R ₆	R ₂	R ₅
P3. 4	CH ₃ CH ₂ C(=O)	CH ₃ CH ₂ C(=O)	Cl	H
P3. 5	CH ₃ CH ₂ CH ₂ C(=O)	CH ₃ CH ₂ CH ₂ C(=O)	Cl	H
P3. 6	Cl-CH ₂ C(=O)	Cl-CH ₂ C(=O)	Cl	H
P3. 7	CF ₃ C(=O)	H	Cl	H
P3. 8	CF ₃ CF ₂ C(=O)	H	Cl	H
P3. 9	CF ₃ CF ₂ CF ₂ C(=O)	H	Cl	H
P3. 10	CF ₃ -O-CF ₂ CF ₂ C(=O)	H	Cl	H
P3. 11	CF ₃ C(=O)	H	CH ₃	H
P3. 12	CH ₃ C(=O)	H	OCH ₃	H
P3. 13	PhC(=O)	H	Cl	H
P3. 14	PhC(=O)	CH ₃ C(=O)	Cl	H

In a preferred embodiment, compound of formula I is when R₁ is H; R₆ is H or (C₁-C₃)alkyl-C(O); R₂ is halogen; R₃ to R₅ is H; and n is 2.

5 Synthesis of compounds I and II are known in the art, see for example, EP 33984, EP191734, DE3544436, EP138762, EP133418, EP110829, EP207891, JP02006496 and JP01319467. In particular synthesis of compounds P1.1, P1.5 and P1.8 are described in EP33984 and EP191734.

10 In an embodiment of each aspect, a pesticidal combination comprising the compound defined in the first aspect and one or more pesticides are applied on the plant propagation material, in any desired sequence or simultaneously.

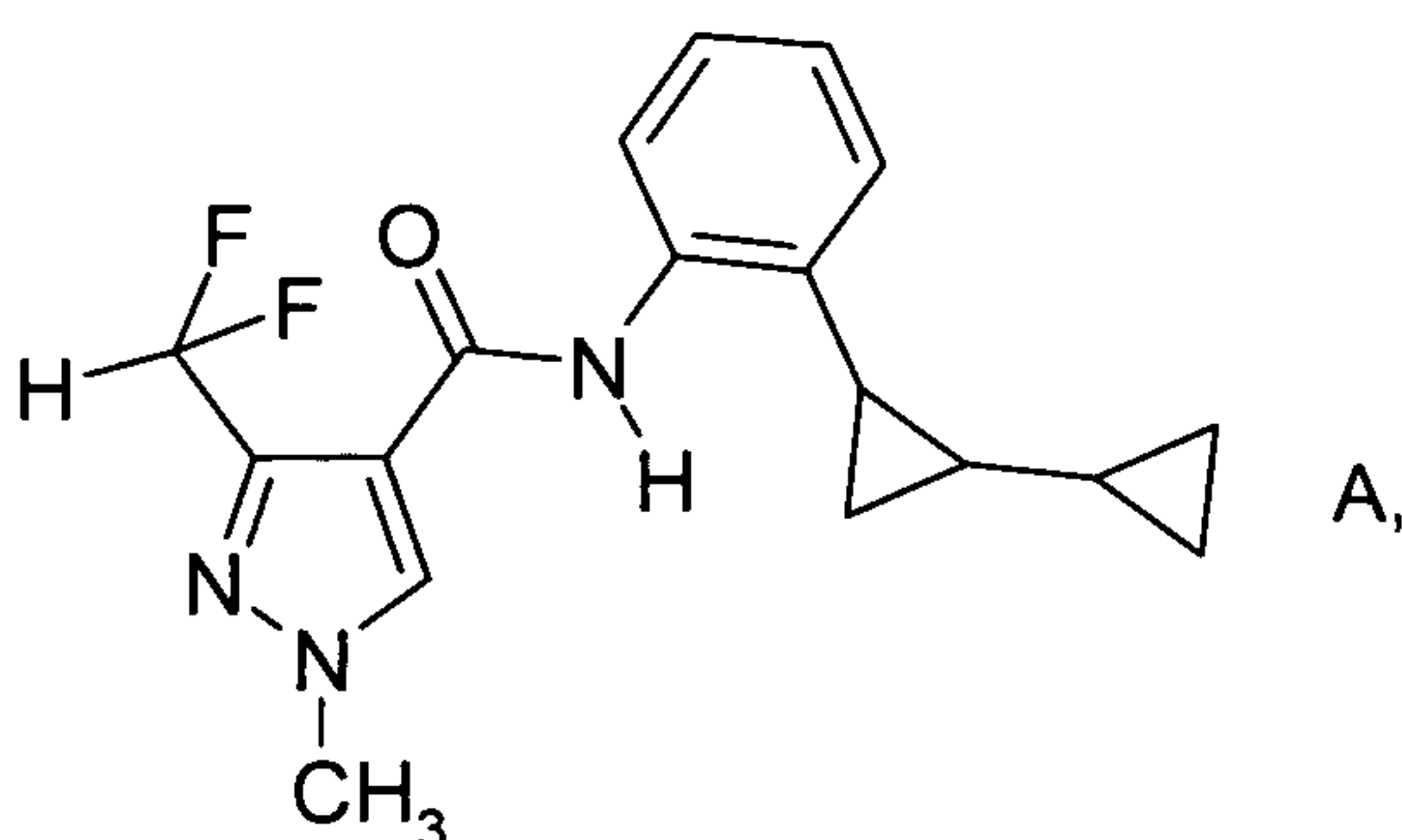
15 In the event a pesticidal combination is used, the compound I or II and one or more pesticides are present in the form of a plant propagation material, preferably seed, treatment composition, wherein the composition optionally further comprises one or more customary formulation auxiliaries.

-11-

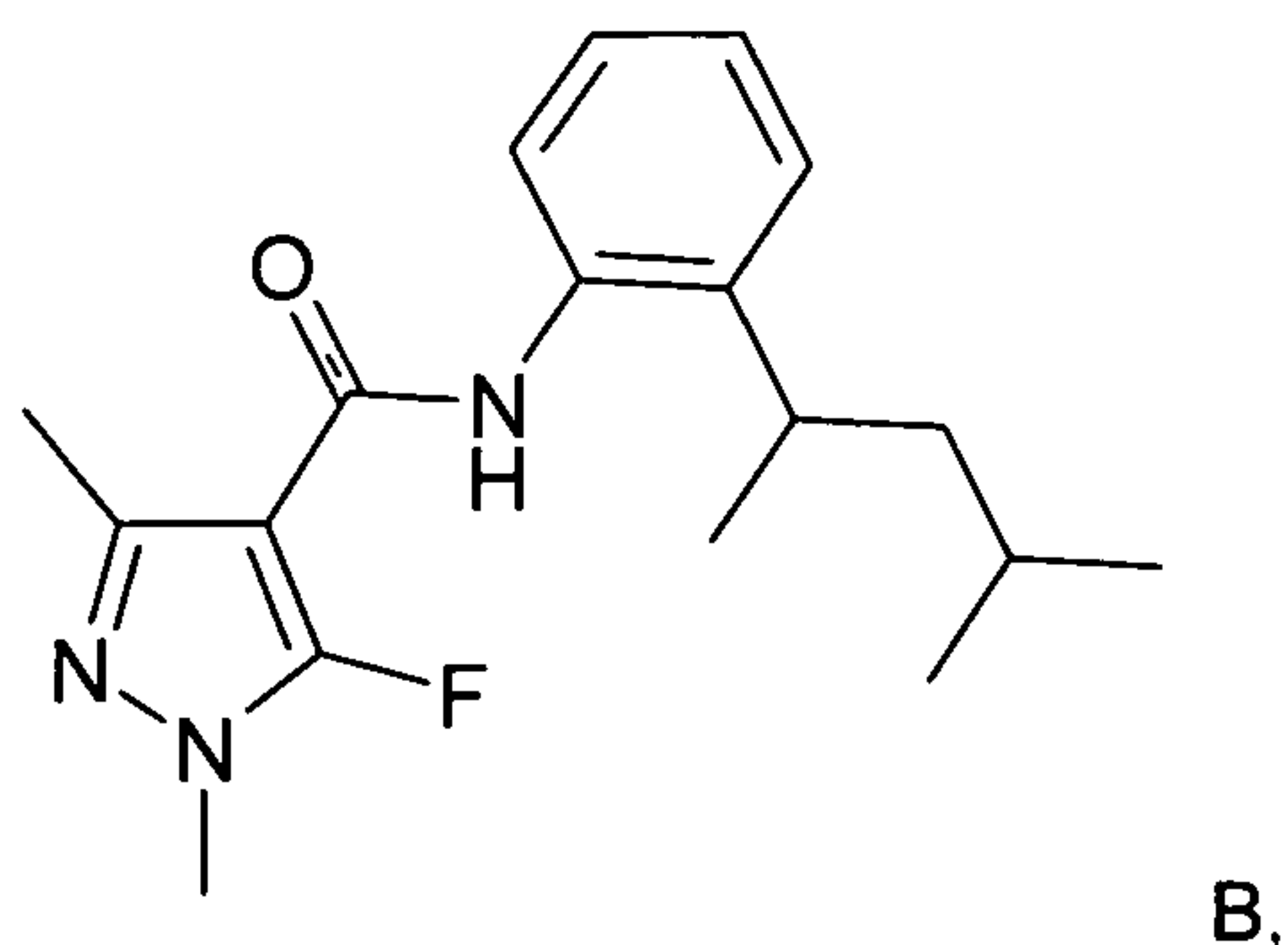
Examples of pesticides include fungicides, bactericides, insecticides, acaricides and nematocides. A preferred pesticide for use in pesticidal combination with the compound I or II is an insecticide, fungicide, acaricides, and/or nematocide.

- 5 Suitable examples of insecticide, acaricide and/or nematocide are thiamethoxam, imidacloprid, clothianidin, lambda-cyhalothrin, tefluthrin, β -cyfluthrin, permethrin, chloranthraniliprole, abamectin, fipronil, and spinosad.

- Suitable examples of fungicides are fludioxonil, penthiopyrad, prothioconazole, flutriafol, difenoconazole, azoxystrobin, captan, cyproconazole, cyprodinil, boscalid, diniconazole, epoxiconazole, fluoxastrobin, trifloxystrobin, metalaxyl, metalaxyl-M (mefenoxam), fluquinconazole, fenarimol, nuarimol, pyrifenox, pyraclostrobin, thiabendazole, tebuconazole, triadimenol, benalaxyl, benalaxyl-M, benomyl, carbendazim, carboxin, flutolanil, fuberizadole, guazatine, myclobutanil, tetraconazole, imazalil, metconazole, bitertanol, cymoxanil, ipconazole, iprodione, prochloraz, pencycuron, propamocarb, silthiofam, thiram, triazoxide, triticonazole, tolylfluanid, a manganese compound (such as mancozeb, maneb), a compound of formula A
- 10
- 15



- 20 or a tautomer of such a compound, and a compound of formula B



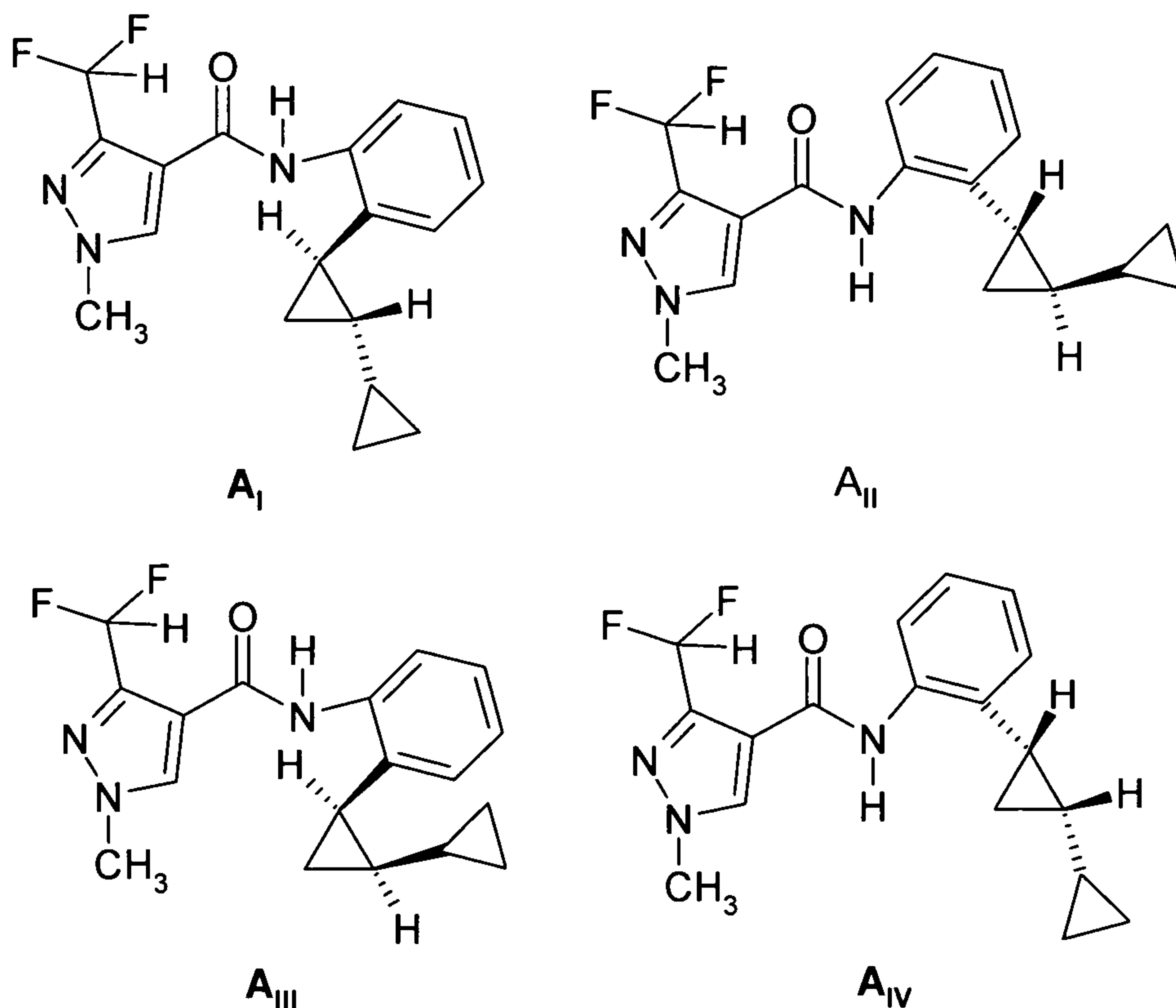
or a tautomer of such a compound.

-12-

In an aspect of the invention, the present invention also provides a pesticidal combination comprising a compound I or II, as defined the first aspect, and one or more defined pesticides. The pesticidal combination is suitable for controlling or preventing pathogenic damage or pest damage in a plant propagation material, a plant, and/or plant organs that grow at a later point in time, which comprises applying on the plant propagation material thereof or locus thereof, the pesticidal combination, in any desired sequence or simultaneously.

In the instance a fungicide is also used in the present invention the biological spectrum of the pesticidal combination is broadened to such an extent that the combination demonstrates activity against damage caused by a pathogens.

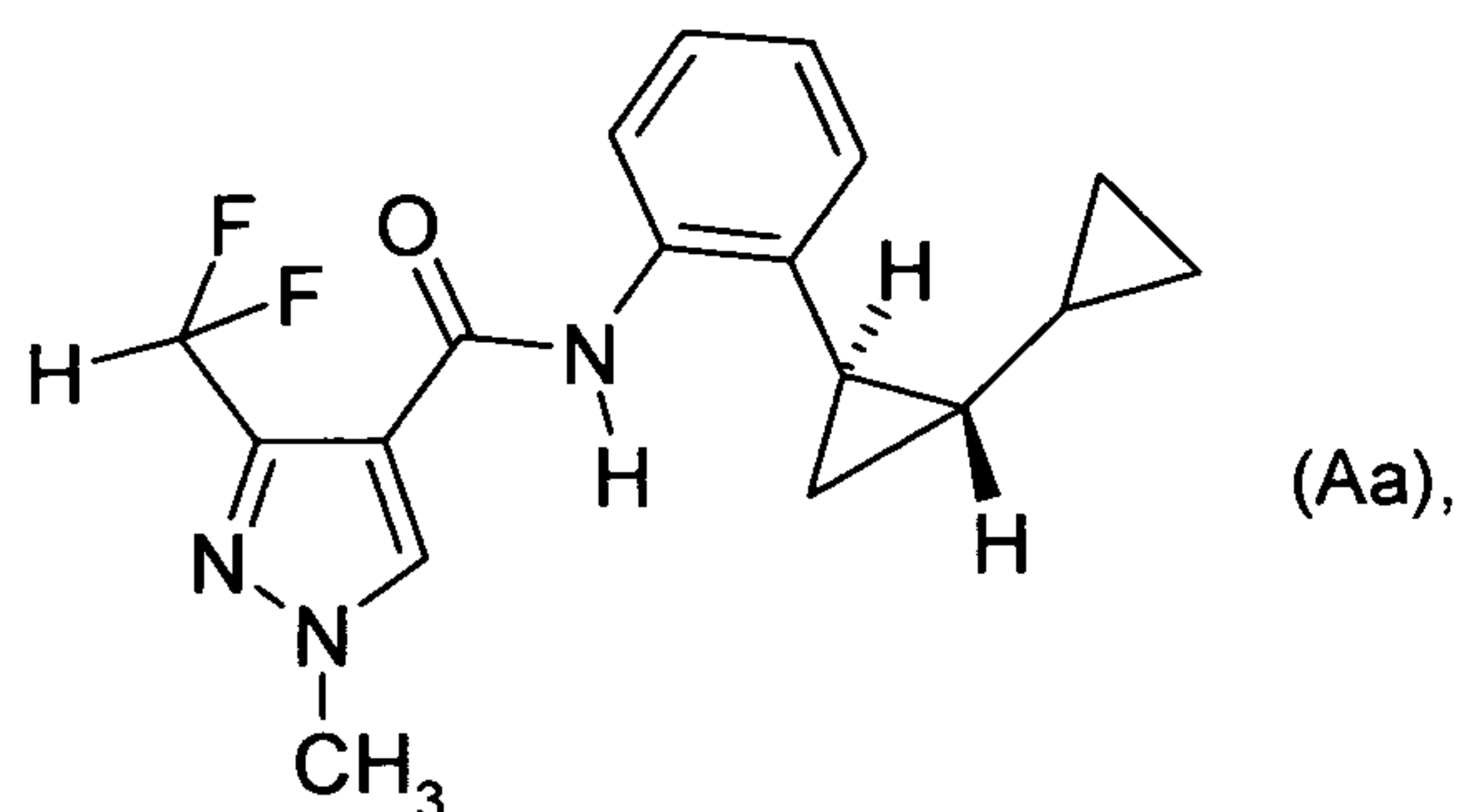
The compound of formula A can occur in different stereoisomeric forms, which are described in formulae A_I, A_{II}, A_{III} and A_{IV}:



The invention covers all such stereoisomers and mixtures thereof in any ratio with a pesticidal combination of compound A.

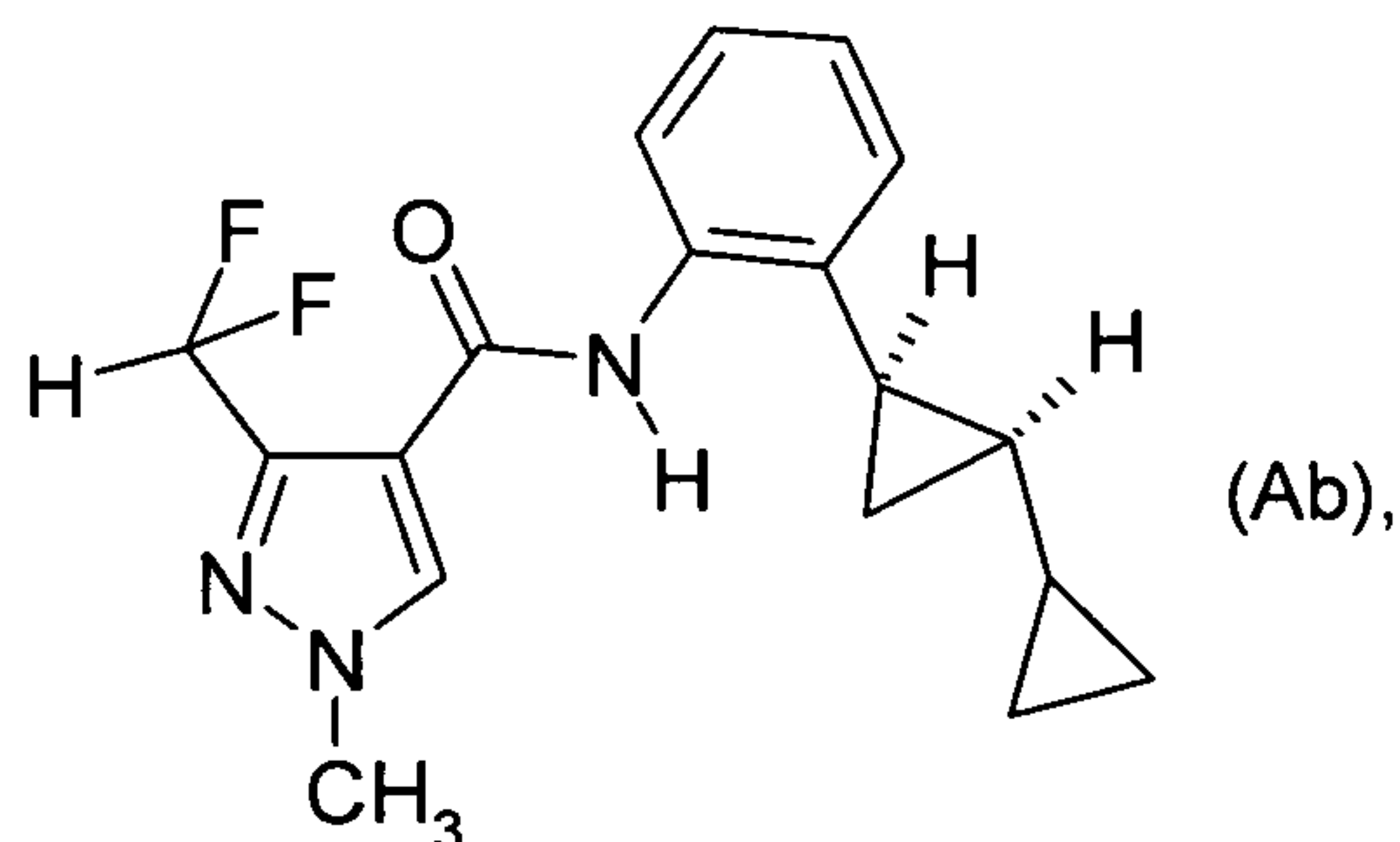
-13-

In an embodiment, compound A is a compound of the formula Aa (trans)



which represents a compound of formula A_I, a compound of formula A_{II} or a mixture in any
5 ratio of a compound of formula A_I and a compound of formula A_{II}.

In an embodiment, compound A is a compound of the formula Ab (cis)



which represents a compound of formula A_{III}, a compound of formula A_{IV} or a mixture in any
10 ratio of a compound of formula A_{III} and a compound of formula A_{IV}.

In a preferred embodiment compound A is a racemic mixture of compound formula A, wherein
the weight ratio of racemic compounds of formula Aa, which represent a racemic mixture of
compounds of formula A_I and compounds of formula A_{II}, to racemic compounds of formula Ab,
15 which represent a racemic mixture of compounds of formula A_{III} and compounds of formula
A_{IV}, is from 1 : 1 to 100. Suitable examples of weight ratios of compound of formula Aa to Ab
in a racemic mixture are 1:1, 2:1, 3:1, 4:1, 5:1, 6:1, 7:1, 8:1, 9:1, 10:1, 20:1, 50:1 or 100 : 1.
Preference is given to ratios from 2:1 to 100:1, more preferably 4:1 to 10:1.

20 In an especially preferred embodiment compound A is a racemic mixture, wherein the content
of racemic compound of formula Aa, which represent a racemic mixture of compounds of
formula A_I and compounds of formula A_{II}, is from 65 to 99 % by weight.

-14-

Details (e.g., structure, chemical name, commercial names, etc) of each of the pesticides with a common name can be found in the e-Pesticide Manual, version 3.1, 13th Edition, Ed. CDC Tomlin, British Crop Protection Council, 2004-05.

5

The compound of formula A (including the different stereoisomeric forms) and its manufacturing processes starting from known and available compounds are described in WO 03/074491.

10 Details of compound of formula B are disclosed in WO 03/010149 and WO 05/58839.

Controlling, preventing or protecting and its inflections, within the context of the present invention, mean reducing any undesired effect, such as

- pathogenic, such as phytopathogenic, especially fungi, infestation or attack of, and
 - 15 - pathogenic damage or pest damage on,
- a plant, part of the plant or plant propagation material to such a level that an improvement is demonstrated.

The compound defined in the first aspect and pesticidal combinations thereof can have very
20 advantageous properties for protecting plant propagation material, parts of plant and/or plant that grows at a later point in time against (i) pest attack or damage, which can result in reduced yield, germination, or susceptibility to attack or damage by other pests and/or pathogens, and/or (ii) pathogenic, such as phytopathogenic, especially fungi, attack or infestation, which can result in a disease and damage to the plant in the instance the pesticidal
25 combination comprises a pesticide that is a fungicide; the present invention can, therefore, control or prevent pest damage and/or pathogenic damage on a plant propagation material, parts of plant and/or plant that grows at a later point in time.

These properties can be for example the unexpected enhanced action resulting in lower
30 pathogenic damage and/or pest damage, lower rates of application, or a longer duration of action. In the instance of agriculture, the enhanced action is found to show an improvement in the growing characteristics of a plant by, for example, higher than expected control of the pathogenic infestation and/or pest damage.

-15-

The improvement in the growing (or growth) characteristics of a plant can manifest in a number of different ways, but ultimately it results in a better product of the plant. It can, for example, manifest in improving the yield and/or vigour of the plant or quality of the harvested product from the plant, which improvement may not be connected to the control of diseases and/or pests.

As used herein the phrase "improving the yield" of a plant relates to an increase in the yield of a product of the plant by a measurable amount over the yield of the same product of the plant produced under the same conditions, but without the application of the subject method. It is preferred that the yield be increased by at least about 0.5%, more preferred that the increase be at least about 1%, even more preferred is about 2%, and yet more preferred is about 4%, or more. Yield can be expressed in terms of an amount by weight or volume of a product of the plant on some basis. The basis can be expressed in terms of time, growing area, weight of plants produced, amount of a raw material used, or the like.

As used herein the phrase "improving the vigour" of a plant relates to an increase or improvement of the vigour rating, or the stand (the number of plants per unit of area), or the plant height, or the plant canopy, or the visual appearance (such as greener leaf colour), or the root rating, or emergence, or protein content, or increased tillering, or bigger leaf blade, or less dead basal leaves, or stronger tillers, or less fertilizer needed, or less seeds needed, or more productive tillers, or earlier flowering, or early grain maturity, or less plant verse (lodging), or increased shoot growth, or earlier germination, or any combination of these factors, or any other advantages familiar to a person skilled in the art, by a measurable or noticeable amount over the same factor of the plant produced under the same conditions, but without the application of the subject method.

When it is said that the present method is capable of "improving the yield and/or vigour" of a plant, the present method results in an increase in either the yield, as described above, or the vigor of the plant, as described above, or both the yield and the vigor of the plant.

Accordingly, the present invention also provides a method of improving the growing characteristics of a plant, which comprises applying to a plant propagation material the compound of the first aspect or a pesticidal combination thereof. In the event a pesticidal

-16-

combination is used, the application of the compound I or II and one or more pesticides can be in in any desired sequence or simultaneously.

5 When the compound I or II is used in combination with one or more pesticides, a synergistically enhanced activity may be observed.

10 Suitable examples of fungicides, insecticides and nematicides include triazole derivatives, strobilurins, carbamate (including thiocarbamate), benzimidazoles (thiabendazole), N-trihalomethylthio compounds (captan), substituted benzenes, carboxamides, phenylamides and phenylpyrroles, and mixtures thereof; and neonicotinoids, avermectins, carbamates and pyrethroids.

15 Accordingly, the invention makes available a combination comprising a compound I and one or more of a pesticide selected from fludioxonil, penthiopyrad, prothioconazole, flutriafol, difenoconazole, azoxystrobin, captan, cyproconazole, cyprodinil, boscalid, diniconazole, epoxiconazole, fluoxastrobin, trifloxystrobin, metalaxyl, metalaxyl-M (mefenoxam), fluquinconazole, fenarimol, nuarimol, pyrifenox, pyraclostrobin, thiabendazole, tebuconazole, triadimenol, benalaxyl, benalaxyl-M, benomyl, carbendazim, carboxin, flutolanil, fuberizadole, guazatine, myclobutanil, tetraconazole, imazalil, metconazole, bitertanol, cymoxanil, 20 ipconazole, iprodione, prochloraz, pencycuron, propamocarb, silthiofam, thiram, triazoxide, triticonazole, tolylfluanid, a manganese compound (such as mancozeb, maneb), a compound of formula A, compound of formula B, thiamethoxam, imidacloprid, clothianidin, lamda-cyhalothrin, tefluthrin, β -cyfluthrin, permethrin, chloranthraniliprole, abamectin, fipronil, and spinosad.

25 Also made available is a available a pesticidal combination comprising a compound II and one or more of a pesticide selected from fludioxonil, penthiopyrad, prothioconazole, flutriafol, difenoconazole, azoxystrobin, captan, cyproconazole, cyprodinil, boscalid, diniconazole, epoxiconazole, fluoxastrobin, trifloxystrobin, metalaxyl, metalaxyl-M (mefenoxam), 30 fluquinconazole, fenarimol, nuarimol, pyrifenox, pyraclostrobin, thiabendazole, tebuconazole, triadimenol, benalaxyl, benalaxyl-M, benomyl, carbendazim, carboxin, flutolanil, fuberizadole, guazatine, myclobutanil, tetraconazole, imazalil, metconazole, bitertanol, cymoxanil, ipconazole, iprodione, prochloraz, pencycuron, propamocarb, silthiofam, thiram, triazoxide, triticonazole, tolylfluanid, a manganese compound (such as mancozeb, maneb), a compound

-17-

of formula A, compound of formula B, thiamethoxam, imidacloprid, clothianidin, lambda-cyhalothrin, tefluthrin, β -cyfluthrin, permethrin, chloranthraniliprole, abamectin, fipronil, and spinosad.

- 5 In an embodiment, a pesticidal combination comprising a compound I and/or II and a compound of formula A; compound I and/or II and a compound of formula B; a compound I and/or II and penthiopyrad; a compound I and/or II and triticonazole; a compound I and/or II and prothioconazole; a compound I and/or II and fluoxastrobin; a compound I and/or II and fluquinconazole; a compound I and/or II and flutriafol, a compound I and/or II and guazatine;
- 10 a compound I and/or II and difenoconazole; a compound I and/or II and fludioxonil; a compound I and/or II and prochloraz; a compound I and/or II and ipconazole; a compound I and/or II and thiamethoxam, a compound I and/or II and imidacloprid, a compound I and/or II and clothianidin; a compound I and/or II and fipronil, a compound I and/or II and abamectin, a compound I and/or II and tefluthrin, a compound I and/or II and lambda cyhalothrin, a
- 15 compound I and/or II and beta-cyfluthrin, a compound I and/or II and cyproconazole; a compound I and/or II and azoxystrobin; a compound I and/or II and metalaxyl; a compound I and/or II and mefenoxam; a compound I and/or II and thiram; a compound I and/or II and captan; a compound I and/or II and spinosad; a compound I and/or II and permethrin; or a compound I and/or II and tebuconazole; is preferred according to the invention.

20

In an embodiment, a pesticidal combination can comprise a compound I, a compound of formula A, and a compound selected from fludioxonil, metalaxyl, mefenoxam, cyprodinil, azoxystrobin, tebuconazole, difenoconazole and thiabendazole.

- 25 In a further embodiment, a pesticidal combination comprising a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin, and beta-cyfluthrin, and boscalid or epoxyconazole or tolylfluanid; a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and azoxystrobin; a compound I,
- 30 an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and fludioxonil, a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and mefenoxam, a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole,

-18-

abamectin, tefluthrin and beta-cyfluthrin, and compound of formula A; a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and prochloraz; a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, 5 abamectin, tefluthrin and beta-cyfluthrin, and prothioconazole; a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and fluoxastrobin; a compound I, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and penthiopyrad; a compound I, an insecticide 10 selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and ipconazole, is advantageous.

In an embodiment, a pesticidal combination can comprise a compound II, a compound of formula A, and a compound selected from fludioxonil, metalaxyl, mefenoxam, cyprodinil, 15 azoxystrobin, tebuconazole, difenoconazole and thiabendazole.

In a further embodiment, a pesticidal combination comprising a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin, and beta-cyfluthrin, and boscalid or epoxyconazole or tolylfluanid; a 20 compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and azoxystrobin; a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and fludioxonil, a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, 25 chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and mefenoxam, a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and compound of formula A; a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and prochloraz; a compound II, 30 an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and prothioconazole; a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and fluoxastrobin; a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil,

-19-

chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and penthiopyrad; a compound II, an insecticide selected from thiamethoxam, imidacloprid, clothianidin, fipronil, chloranthraniliprole, abamectin, tefluthrin and beta-cyfluthrin, and ipconazole, is advantageous.

5

The compound I or II and pesticidal combinations thereof are suitable for control of pests, such as animal pests, such as those anthropodal pests, e.g. arachnids, myriapedes and insects as well as nematodes, i.e. those present in soil and above ground and found in agriculture. Examples of pests include:

10

from the order Lepidoptera, for example, *Acleris* spp., *Adoxophyes* spp., *Aegeria* spp., *Agrotis* spp., *Alabama argillaceae*, *Amylois* spp., *Anticarsia gemmatilis*, *Archips* spp., *Argyrotaenia* spp., *Autographa* spp., *Busseola fusca*, *Cadra cautella*, *Carposina nipponensis*, *Chilo* spp., *Choristoneura* spp., *Clysia ambiguella*, *Cnaphalocrocis* spp., *Cnephasia* spp., *Cochylis* spp.,
 15 *Coleophora* spp., *Crocidolomia* spp., *Cryptophlebia leucotreta*, *Crysodeixis includens*, *Cydia* spp., *Diatraea* spp., *Diparopsis castanea*, *Earias* spp., *Elasmopalpus* spp., *Epehstia* spp., *Eucosma* spp., *Eupoecilia ambiguella*, *Euproctis* spp., *Euxoa* spp., *Grapholita* spp., *Hedya nubiferana*, *Heliothis* spp., *Hellula undalis*, *Hyphantria cunea*, *Keiferia lycopersicella*, *Leucoptera scitella*, *Lithocollethis* spp., *Lobesia botrana*, *Lymantria* spp., *Lyonetia* spp.,
 20 *Malacosoma* spp., *Mamestra brassicae*, *Manduca sexta*, *Operophtera* spp., *Ostrinia nubilalis*, *Pammene* spp., *Pandemis* spp., *Panolis flammea*, *Pectinophora gossypiella*, *Phthorimaea operculella*, *Pieris rapae*, *Pieris* spp., *Plutella xylostella*, *Prays* spp., *Scirpophaga* spp., *Sesamia* spp., *Sparganothis* spp., *Spodoptera* spp., *Synanthedon* spp., *Thaumetopoea* spp., *Tortrix* spp., *Trichoplusia ni* and *Yponomeuta* spp.;

25

from the order Coleoptera, for example, *Agriotes* spp., *Anthonomus* spp., *Atomaria linearis*, *Ceutorhynchus* spp., *Chaetocnema tibialis*, *Cosmopolites* spp., *Curculio* spp., *Dermestes* spp., *Diabrotica* spp., *Epilachna* spp., *Eremnus* spp., *Gonocephalum* spp., *Heteronychus* spp., *Leptinotarsa decemlineata*, *Lissorhoptrus* spp., *Melolontha* spp., *Oryzaephilus* spp., *Otiorhynchus* spp., *Phlyctinus* spp., *Phyllotreta* spp., *Popillia* spp., *Protostrophus* spp.,
 30 *Psylliodes* spp., *Rhizopertha* spp., *Scarabeidae*, *Sitophilus* spp., *Sitotroga* spp., *Tenebrio* spp., *Tribolium* spp. and *Trogoderma* spp.;

from the order Orthoptera, for example, *Blatta* spp., *Blattella* spp., *Gryllotalpa* spp., *Leucophaea maderae*, *Locusta* spp., *Periplaneta* spp. and *Schistocerca* spp.;

from the order Isoptera, for example, *Reticulitermes* spp.;

-20-

from the order Psocoptera, for example, *Liposcelis* spp.;

from the order Anoplura, for example, *Haematopinus* spp., *Linognathus* spp., *Pediculus* spp., *Pemphigus* spp. and *Phylloxera* spp.;

from the order Mallophaga, for example, *Damalinea* spp. and *Trichodectes* spp.;

5 from the order Thysanoptera, for example, *Frankliniella* spp., *Hercinothrips* spp., *Taeniothrips* spp., *Thrips palmi*, *Thrips tabaci* and *Scirtothrips aurantii*;

from the order Heteroptera, for example, *Dichelops melacanthus*, *Distantiella theobroma*, *Dysdercus* spp., *Euchistus* spp., *Eurygaster* spp., *Leptocorisa* spp., *Nezara* spp., *Piesma* spp., *Rhodnius* spp., *Sahlbergella singularis*, *Scotinophara* spp. and *Triatoma* spp.;

10 from the order Homoptera, for example, *Aleurothrixus floccosus*, *Aleyrodes brassicae*, *Aonidiella* spp., *Aphididae*, *Aphis* spp., *Aspidiotus* spp., *Bemisia tabaci*, *Ceroplaster* spp., *Chrysomphalus aonidium*, *Chrysomphalus dictyospermi*, *Coccus hesperidum*, *Empoasca* spp., *Eriosoma larigerum*, *Erythroneura* spp., *Gascardia* spp., *Laodelphax* spp., *Lecanium corni*, *Lepidosaphes* spp., *Macrosiphus* spp., *Myzus* spp., *Nephotettix* spp., *Nilaparvata* spp.,

15 *Paratoria* spp., *Pemphigus* spp., *Planococcus* spp., *Pseudaulacaspis* spp., *Pseudococcus* spp., *Psylla* spp., *Pulvinaria aethiopica*, *Quadraspidotus* spp., *Rhopalosiphum* spp., *Saissetia* spp., *Scaphoideus* spp., *Schizaphis* spp., *Sitobion* spp., *Trialeurodes vaporariorum*, *Trioza erytrae* and *Unaspis citri*;

from the order Hymenoptera, for example, *Acromyrmex*, *Athalia rosae*, *Atta* spp., *Cephus*

20 spp., *Diprion* spp., *Diprionidae*, *Gilpinia polytoma*, *Hoplocampa* spp., *Lasius* spp., *Monomorium pharaonis*, *Neodiprion* spp., *Solenopsis* spp. and *Vespa* spp.;

from the order Diptera, for example, *Antherigona soccata*, *Bibio hortulanus*, , *Ceratitis* spp., *Chrysomyia* spp., *Culex* spp., *Cuterebra* spp., *Dacus* spp., *Delia* spp., *Drosophila melanogaster*, , *Liriomyza* spp., , *Melanagromyza* spp., , *Orseolia* spp., *Oscinella frit*,

25 *Pegomyia hyoscyami*, *Phorbia* spp., *Rhagoletis pomonella*, *Sciara* spp.,;

from the order Acarina, for example, *Acarus siro*, *Aceria sheldoni*, *Aculus schlechtendali*, *Amblyomma* spp., *Argas* spp., , *Brevipalpus* spp., *Bryobia praetiosa*, *Calipitimerus* spp., *Chorioptes* spp., *Dermanyssus gallinae*, *Eotetranychus carpini*, *Eriophyes* spp., *Hyalomma* spp., *Olygonychus pratensis*, *Ornithodoros* spp., *Panonychus* spp., *Phyllocoptruta oleivora*,

30 *Polyphagotarsonemus latus*, *Psoroptes* spp., *Rhipicephalus* spp., *Rhizoglyphus* spp., *Sarcoptes* spp., *Tarsonemus* spp. and *Tetranychus* spp.; and

from the class Nematoda, for example, the species of *Meloidogyne* spp. (for example, *Meloidogyne incognita* and *Meloidogyne javanica*), *Heterodera* spp. (for example, *Heterodera glycines*, *Heterodera schachtii*, *Heterodora avenae* and *Heterodora trifolii*), *Globodera* spp. (for

-21-

- example, *Globodera rostochiensis*), *Radopholus* spp. (for example, *Radopholus similis*), *Rotylenchulus* spp., *Pratylenchus* spp. (for example, *Pratylenchus neglectans* and *Pratylenchus penetrans*), *Aphelenchoides* spp., *Helicotylenchus* spp., *Hoplolaimus* spp., *Paratrichodorus* spp., *Longidorus* spp., *Nacobbus* spp., *Subanguina* spp. *Belonlaimus* spp.,
- 5 *Criconemella* spp., *Criconemoides* spp. *Ditylenchus* spp., *Dolichodorus* spp., *Hemicriconemoides* spp., *Hemicyclophora* spp., *Hirschmaniella* spp., *Hypsoperine* spp., *Macroposthonia* spp., *Melinius* spp., *Punctodera* spp., *Quinisulcius* spp., *Scutellonema* spp., *Xiphinema* spp., and *Tylenchorhynchus* spp.
- 10 Compounds I and II can be particularly suitable for controlling insects, preferably sucking or piercing insects such as insects from the genera Thysanoptera, Hymenoptera, Orthoptera and Homoptera, in particular the following species:
- Thysanoptera (thrips): *Frankliniella fusca*, *Frankliniella occidentalis*, *Frankliniella tritici*, *Scirtothrips citri*, *Thrips oryzae*, *Thrips palmi* and *Thrips tabaci*,
- 15 Hymenoptera: *Athalia rosae*, *Atta cephalotes*, *Atta sexdens*, *Atta texana*, *Hoplocampa minuta*, *Hoplocampa testudinea*, *Monomorium pharaonis*, *Solenopsis geminata* and *Solenopsis invicta*,
- Orthoptera: *Acheta domestica*, *Blatta orientalis*, *Blattella germanica*, *Forficula auricularia*,
- 20 *Gryllotalpa gryllotalpa*, *Locusta migratoria*, *Melanoplus bivittatus*, *Melanoplus femur-rubrum*, *Melanoplus mexicanus*, *Melanoplus sanguinipes*, *Melanoplus spretus*, *Nomadacris septemfasciata*, *Periplaneta americana*, *Schistocerca americana*, *Schistocerca peregrina*, *Stauronotus maroccanus* and *Tachycines asynamorus*;
- 25 Homoptera, in particular aphids: *Acyrtosiphon onobrychis*, *Adelges laricis*, *Aphidula nasturtii*, *Aphis fabae*, *Aphis forbesi*, *Aphis pomi*, *Aphis gossypii*, *Aphis grossulariae*, *Aphis schneideri*, *Aphis spiraecola*, *Aphis sambuci*, *Acyrtosiphon pisum*, *Aulacorthum solani*, *Brachycaudus cardui*, *Brachycaudus helichrysi*, *Brachycaudus persicae*, *Brachycaudus prunicola*, *Brevicoryne brassicae*, *Capitophorus horni*, *Cerosipha gossypii*, *Chaetosiphon fragaefolii*,
- 30 *Cryptomyzus ribis*, *Dreyfusia nordmannianae*, *Dreyfusia piceae*, *Dysaphis radicola*, *Dysaulacorthum pseudosolani*, *Dysaphis plantaginea*, *Dysaphis pyri*, *Empoasca fabae*, *Hyalopterus pruni*, *Hyperomyzus lactucae*, *Macrosiphum avenae*, *Macrosiphum euphorbiae*, *Macrosiphon rosae*, *Megoura viciae*, *Melanaphis pyraeae*, *Metopolophium dirhodum*, *Myzodes persicae*, *Myzus ascalonicus*, *Myzus cerasi*, *Myzus varians*, *Nasonovia ribis-nigri*, *Nilaparvata*

-22-

lugens, Pemphigus bursarius, Perkinsiella saccharicida, Phorodon humuli, Psylla mali, Psylla piri, Rhopalomyzus ascalonicus, Rhopalosiphum maidis, Rhopalosiphum padi, Rhopalosiphum insertum, Sappaphis mala, Sappaphis mali, Schizaphis graminum, Schizoneura lanuginosa, Sitobion avenae, Trialeurodes vaporariorum, Toxoptera aurantiiand, and Viteus vitifolii;

5 Compounds I and II particularly useful for controlling insects of the orders Homoptera and Thysanoptera and more preferably for controlling aphids, in particular Aphis craccivora and Myzus persicae. Compound P1.1, P1.5 and P1.58 ar especially effective seed treatment compounds for controlling aphids.

10 In the event a pesticidal combination of the invention also includes a pesticide such as a fungicide, the combination is effective against phytopathogenic fungi, especially occurring in plants, including seedborne fungi and belong to the following classes: Ascomycetes (e.g. Penicillium, Gaeumannomyces graminis); Basidiomycetes (e.g. the genus Hemileia, Rhizoctonia, Puccinia); Fungi imperfecti (e. g. Botrytis, Helminthosporium, Rhynchosporium, 15 Fusarium, Septoria, Cercospora, Alternaria, Pyricularia and Pseudocercospora herpotrichoides); Oomycetes (e. g. Phytophthora, Peronospora, Bremia, Pythium, Plasmopara); Zygomycetes (e.g., Rhizopus spp.). The compound I and/or II and pesticidal combinations thereof are especially effective against Alternaria spp., Ascochyta spp., Aspergillus spp., Claviceps purpurea, Cochliobolus spp., Colletotrichum spp., Diplodia maydis, 20 Erysiphe graminis, Fusarium spp. (such as Fusarium culmorum, Fusarium oxysporum, Fusarium solani, Fusarium graminearum and Fusarium moniliforme, Fusarium subglutinans), Gaeumannomyces graminis, Giberella fujikuroi, Giberella zeae, Helminthosporium spp. (such as Helminthosporium graminearum, Helminthosporium oryzae, Helminthosporium solani), Monographella nivalis, Penicillium spp., Puccinia spp., Pyrenophora spp. (such as 25 Pyrenophora graminea), Peronosclerospora spp., Peronospora spp., Phakopsora pachyrhizi, Pythium spp., Phoma spp., Phomopsis spp., Rhizoctonia spp. (such as Rhizoctonia cerealis, Rhizoctonia solani), Septoria spp., Pseudocercospora spp., Tilletia spp., Rhizopus spp., Thielaviopsis basicola, Typhula spp., Ustilago spp., Sphacelotheca spp. (e.g. Sphacelotheca reilliani), Thanatephorus cucumeris, and Verticillium spp..

30 The compound I and/or II and pesticidal combinations thereof can be formulated for a particular use. Preferably, the compound I and/or II and pesticidal combination thereof can be formulated for protecting plant propagation materials. Advantageously, the pesticidal combinations are formulated for plant propagation material, preferably seed, treatment

-23-

applications for controlling or preventing damage by pests and/or pathogens, which are found in agriculture and forestry, and can particularly damage the plant in the early stages of its development.

- 5 Further, the present invention also envisages soil application of the compound I and/or II or pesticidal combinations thereof, for example, to control the soil-dwelling pests and/or soil-borne pathogens. Methods of applying to the soil can be via any suitable method, which ensures that the pesticidal combination penetrates the soil, for example, nursery tray application, in furrow application, soil drenching, soil injection, drip irrigation, application
10 through sprinklers or central pivot, incorporation into soil (broad cast or in band) are such methods.

The benefit from the invention can also be achieved either by (i) treating plant propagation material with a compound I and/or II or a combination thereof or (ii) applying to the locus
15 where control is desired, generally the planting site, the compound I and/or II or a combination thereof, or both (i) and (ii).

The term "plant propagation material" is understood to denote all the generative parts of the plant, such as seeds, which can be used for the multiplication of the latter and vegetative plant
20 material such as cuttings and tubers (for example, potatoes). There may be mentioned, e.g., the seeds (in the strict sense), roots, fruits, tubers, bulbs, rhizomes, parts of plants. Germinated plants and young plants, which are to be transplanted after germination or after emergence from the soil, may also be mentioned. These young plants may be protected before transplantation by a total or partial treatment by immersion.

25 Parts of plant and plant organs that grow at later point in time are any sections of a plant that develop from a plant propagation material, such as a seed. Parts of plant, plant organs, and plants can also benefit from the pathogenic and/or pest damage protection achieved by the application of the compound defined in the first aspect or a pesticidal combination thereof on
30 to the plant propagation material. In an embodiment, certain parts of plant and certain plant organs that grow at later point in time can also be considered as plant propagation material, which can themselves be applied (or treated) with the compound defined in the first aspect or a pesticidal combination thereof; and consequently, the plant, further parts of the plant and further plant organs that develop from the treated parts of plant and treated plant organs can

-24-

also benefit from the pathogenic and/or pest damage protection achieved by the application of the compound defined in the first aspect or a pesticidal combination thereof on to the certain parts of plant and certain plant organs.

- 5 Methods for applying or treating pesticidal active ingredients and mixtures thereof on to plant propagation material, especially seeds, are known in the art, and include dressing, coating, pelleting and soaking application methods of the propagation material.

10 The active ingredients can be applied to the seeds using conventional treating techniques and machines, such as fluidized bed techniques, the roller mill method, rotostatic seed treaters, and drum coaters. Other methods, such as spouted beds may also be useful. The seeds may be presized before coating. After coating, the seeds are typically dried and then transferred to a sizing machine for sizing. Such procedures are known in the art.

- 15 In a preferred embodiment, the compound defined in first aspect or a pesticidal combination thereof is applied or treated on to the plant propagation material by a method such that the germination is not induced; generally seed soaking induces germination because the moisture content of the resulting seed is too high. Accordingly, examples of suitable methods for applying (or treating) a plant propagation material, such as a seed, is seed dressing, seed
20 coating or seed pelleting and alike.

It is preferred that the plant propagation material is a seed. Although it is believed that the present method can be applied to a seed in any physiological state, it is preferred that the seed be in a sufficiently durable state that it incurs no damage during the treatment
25 process. Typically, the seed would be a seed that had been harvested from the field; removed from the plant; and separated from any cob, stalk, outer husk, and surrounding pulp or other non-seed plant material. The seed would preferably also be biologically stable to the extent that the treatment would cause no biological damage to the seed. It is believed that the treatment can be applied to the seed at any time between harvest of the
30 seed and sowing of the seed or during the sowing process (seed directed applications). The seed may also be primed either before or after the treatment.

Even distribution of the active ingredients and adherence thereof to the seeds is desired during propagation material treatment. Treatment could vary from a thin film (dressing) of the

-25-

formulation containing the active ingredient(s) on a plant propagation material, such as a seed, where the original size and/or shape are recognizable to an intermediary state (such as a coating) and then to a thicker film (such as pelleting with many layers of different materials (such as carriers, for example, clays; different formulations, such as of other active
5 ingredients; polymers; and colourants) where the original shape and/or size of the seed is no longer recognisable.

The seed treatment occurs to an unsown seed, and the term "unsown seed" is meant to include seed at any period between the harvest of the seed and the sowing of the seed in
10 the ground for the purpose of germination and growth of the plant.

Treatment to an unsown seed is not meant to include those practices in which the active ingredient is applied to the soil but would include any application practice that would target the seed during the planting process.

15

Preferably, the treatment occurs before sowing of the seed so that the sown seed has been pre-treated with the compound defined in the first aspect or a pesticidal combination thereof. In particular, seed coating or seed pelleting are preferred in the treatment of the compound defined in the first aspect and pesticidal combinations thereof. As a result of the
20 treatment, the active ingredients are adhered on to the seed and therefore available for pest and/or disease control.

The treated seeds can be stored, handled, sowed and tilled in the same manner as any other active ingredient treated seed.

25

The compound I and/ or II and a pesticidal combination thereof according to the present invention is suitable for plants of the crops, such as cereals (wheat, barley, rye, oats, corn, rice, sorghum, triticale and related crops); beet (sugar beet and fodder beet); leguminous plants (beans, lentils, peas, soybeans); oil plants (rape, mustard, sunflowers); cucumber
30 plants (marrows, cucumbers, melons); fibre plants (cotton, flax, hemp, jute); vegetables (spinach, lettuce, asparagus, cabbages, carrots, onions, tomatoes, potatoes, paprika); as well as ornamentals (flowers, shrubs, broad-leaved trees and evergreens, such as conifers). Especially suitable are wheat, barley, rye, oats, corn and soybean, triticale.

-26-

Suitable target crops also include transgenic crop plants of the foregoing types. The transgenic crop plants used according to the invention are plants, or propagation material thereof, which are transformed by means of recombinant DNA technology in such a way that they are - for instance - capable of synthesizing selectively acting toxins as are known, for example, from toxin-producing invertebrates, especially of the phylum Arthropoda, as can be obtained from *Bacillus thuringiensis* strains; or as are known from plants, such as lectins; or in the alternative capable of expressing a herbicidal or fungicidal resistance. Examples of such toxins, or transgenic plants which are capable of synthesizing such toxins, have been disclosed, for example, in EP-A-0 374 753, WO 93/07278, WO 95/34656, EP-A-0 427 529 and EP-A-451 878 and are incorporated by reference in the present application.

In the instance of a pesticidal combination, the weight ratio of a compound I and/or II with a pesticide is selected as to give the desired, for example, synergistic, action. In general, the weight ratio would vary depending on the specific pesticide and how many pesticides are present in the combination. Generally, the weight ratio between any two active ingredients is from 100:1 to 1:100, preferably from 75:1 to 1:75, more preferably, 50:1 to 1:50, especially 25:1 to 1:25, advantageously 10:1 to 1:10.

The rates of application (use) of the compound I and/or II alone or in combination with one or more pesticides vary, for example, according to type of use, type of crop, the specific active ingredients in the combination, type of plant propagation material but is such that the active ingredients in the combination is an effective amount to provide the desired enhanced action (such as disease or pest control) and can be determined by trials.

Generally for plant propagation material, such as seed, treatment, application rates can vary from 0.5 to 1000g / 100kg of seeds of active ingredients.

A compound I or II can be applied to a plant propagation material in an amount of 0.01 to 1, preferably 0.02 to 0.6, such as 0.05 to 0.15, mg/seed.

Suitable seed treatment application rates of a compound I or II can be 1 - 200, preferably 2 - 150 more preferably 10-100, g/100kg, of seeds, and if one or more pesticides are also present, then the total rates tend to 1-1000, preferably 2-550, more preferably 10 - 450, g/100kg.

-27-

The plant propagation material treated by a compound I and/or II or pesticidal combination thereof of the present invention are, therefore, resistant to pest damage; accordingly, the present invention also provides a pest resistant plant propagation material which is treated
5 with compound I and/or II or the pesticidal combination thereof and consequently at least the active ingredients thereof are adhered on the propagation material, such a seed.

The seed treatment composition comprising a compound I and/or II or pesticidal combination thereof can also comprise or may be applied together and/or sequentially with further active
10 compounds. These further compounds can be other pesticidal active ingredients, fertilizers or micronutrient donors or other preparations that influence plant growth, such as inoculants and plant inducers.

A single pesticidal active ingredient may have activity in more than area of pest control, for
15 example, a pesticide may have fungicide, insecticide and nematocide activity. Specifically, aldicarb is known for insecticide, acaricide and nematocide activity, while metam is known for insecticide, herbicide, fungicide and nematocide activity, and thiabendazole and captan can provide nematocide and fungicide activity.

20 The pesticidal combination of the present invention may be mixed with other pesticides, such as fungicides, insecticides and nematocides as described above.

The compound of formula I and/or II and the pesticide(s) may be used either in pure form, i.e., as a solid active ingredient, for example, in a specific particle size, or preferably together with
25 at least one of the auxiliary (also known as adjuvants) customary in formulation technology, such as extenders, e.g., solvents or solid carriers, or surface-active compounds (surfactants), in the form of a formulation, in the present invention. Generally, the compound and pesticide(s) are in the form of a formulation composition with one or more of customary formulation auxiliaries.

30

Therefore, a compound I and/or II or pesticidal combination thereof is normally used in the form of formulations. The compound I and/or II and the pesticide(s) making-up the pesticidal combination can be applied to the locus where control is desired either simultaneously or in succession at short interval, for example on the same day, if desired together with further

-28-

carriers, surfactants or other application-promoting adjuvants customarily employed in formulation technology. In a preferred embodiment, the pesticidal combination is applied simultaneously.

- 5 In the event pesticidal combination is applied simultaneously in the present invention, they may be applied as a composition, in which case the compound of formula I and/or II and the pesticide(s) can be obtained from a separate formulation source and mixed together (known as a tank-mix, ready-to-apply, spray broth, or slurry), optionally with other pesticides, or they can be obtained as single formulation mixture source (known as a pre-mix, concentrate,
10 formulated compound (or product)), and optionally mixed together with other pesticides.

In an embodiment, the pesticidal combination of the present invention is applied as a composition.

- 15 In a preferred embodiment of the invention, the composition is a pre-mix composition (or mixture).

Examples of foliar formulation types for pre-mix compositions are:

- GR: Granules
20 WP: wettable powders
WG: water dispersable granules (powders)
SG: water soluble granules
SL: soluble concentrates
EC: emulsifiable concentrate
25 EW: emulsions, oil in water
ME: micro-emulsion
SC: aqueous suspension concentrate
CS: aqueous capsule suspension
OD: oil-based suspension concentrate, and
30 SE: aqueous suspo-emulsion.

Whereas, examples of seed treatment formulation types for pre-mix compositions are:

- WS: wettable powders for seed treatment slurry
LS: solution for seed treatment

-29-

ES: emulsions for seed treatment

FS: suspension concentrate for seed treatment

WG: water dispersible granules, and

CS: aqueous capsule suspension.

5

Examples of formulation types suitable for tank-mix compositions are solutions, dilute emulsions, suspensions, or a mixture thereof, and dusts.

10 As with the nature of the formulations, the methods of application, such as foliar, drench, spraying, atomizing, dusting, scattering, coating or pouring, are chosen in accordance with the intended objectives and the prevailing circumstances.

15 The tank-mix compositions are generally prepared by diluting with a solvent (for example, water) the one or more pre-mix compositions containing different pesticides, and optionally further auxiliaries.

Suitable carriers and adjuvants can be solid or liquid and are the substances ordinarily employed in formulation technology, e.g. natural or regenerated mineral substances, solvents, dispersants, wetting agents, tackifiers, thickeners, binders or fertilizers.

20

The formulations are prepared in known manner, e.g., by homogeneously mixing and/or grinding the active ingredients with extenders, e.g., solvents, solid carriers and, where appropriate, surface-active compounds (surfactants).

25 Suitable solvents are: aromatic hydrocarbons, preferably the fractions containing 8 to 12 carbon atoms, e.g. xylene mixtures or substituted naphthalenes, phthalates, such as dibutyl phthalate or dioctyl phthalate, aliphatic hydrocarbons, such as cyclohexane or paraffins, alcohols and glycols and their ethers and esters, such as ethanol, ethylene glycol, ethylene glycol monomethyl or monoethyl ether, ketones, such as cyclohexanone, strongly polar
30 solvents, such as N-methyl-2-pyrrolidone, dimethyl sulfoxide or dimethylformamide, as well as vegetable oils or epoxidised vegetable oils, such as epoxidised coconut oil or soybean oil; or water.

-30-

The solid carriers used, e.g., for dusts and dispersible powders, are normally natural mineral fillers, such as calcite, talcum, kaolin, montmorillonite or attapulgite. In order to improve the physical properties it is also possible to add highly dispersed silicic acid or highly dispersed absorbent polymers. Suitable granulated adsorptive carriers are porous types, for example pumice, broken brick, sepiolite or bentonite, and suitable nonsorbent carriers are, for example, calcite or sand. In addition, a great number of pregranulated materials of inorganic or organic nature can be used, e.g., especially dolomite or pulverized plant residues.

Depending upon the nature of the active ingredient compounds to be formulated, suitable surface-active compounds are non-ionic, cationic and/or anionic surfactants having good emulsifying, dispersing and wetting properties. The term "surfactants" will also be understood as comprising mixtures of surfactants.

Particularly advantageous application-promoting adjuvants are also natural or synthetic phospholipids of the cephalin and lecithin series, e.g., phosphatidylethanolamine, phosphatidylserine, phosphatidylglycerol and lysolecithin.

Generally, a tank-mix formulation for soil application comprises 0.1 to 20%, especially 0.1 to 15 %, active ingredient compounds, and 99.9 to 80 %, especially 99.9 to 85 %, of a solid or liquid auxiliaries (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 20 %, especially 0.1 to 15 %, based on the tank-mix formulation.

Typically, a pre-mix formulation for soil application comprises 0.1 to 99.9 %, especially 1 to 95 %, active ingredient compounds, and 99.9 to 0.1 %, especially 99 to 5 %, of a solid or liquid adjuvant (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 50 %, especially 0.5 to 40 %, based on the pre-mix formulation.

Normally, a tank-mix formulation for seed treatment application comprises 0.25 to 80%, especially 1 to 75 %, active ingredient compounds, and 99.75 to 20 %, especially 99 to 25 %, of a solid or liquid auxiliaries (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 40 %, especially 0.5 to 30 %, based on the tank-mix formulation.

-31-

Typically, a pre-mix formulation for seed treatment application comprises 0.5 to 99.9 %, especially 1 to 95 %, active ingredient compounds, and 99.5 to 0.1 %, especially 99 to 5 %, of a solid or liquid adjuvant (including, for example, a solvent such as water), where the auxiliaries can be a surfactant in an amount of 0 to 50 %, especially 0.5 to 40 %, based on the pre-mix formulation.

Whereas commercial products will preferably be formulated as concentrates (e.g., pre-mix composition (formulation)), the end user will normally employ dilute formulations (e.g., tank mix composition).

Preferred seed treatment pre-mix formulations are aqueous suspension concentrates. The formulation can be applied to the seeds using conventional treating techniques and machines, such as fluidized bed techniques, the roller mill method, rotostatic seed treaters, and drum coaters. Other methods, such as spouted beds may also be useful. The seeds may be presized before coating. After coating, the seeds are typically dried and then transferred to a sizing machine for sizing. Such procedures are known in the art.

The Examples which follow serve to illustrate formulations according to the invention, "active ingredient" denoting a compound I and/or II or a combination thereof with another pesticide(s).

Formulation Examples

Wettable powders

	a)	b)	c)
active ingredient	25 %	50 %	75 %
sodium lignosulfonate	5 %	5 %	-
sodium lauryl sulfate	3 %	-	5 %
sodium diisobutyl-naphthalenesulfonate	-	6 %	10 %
phenol polyethylene glycol ether (7-8 mol of ethylene oxide)	-	2 %	-
highly dispersed silicic acid	5 %	10 %	10 %
Kaolin	62 %	27 %	-

-32-

The active ingredient is thoroughly mixed with the adjuvants and the mixture is thoroughly ground in a suitable mill, affording wettable powders that can be diluted with water to give suspensions of the desired concentration.

Powders for dry seed treatment

	a)	b)	c)
active ingredient	25 %	50 %	75 %
light mineral oil	5 %	5 %	5 %
highly dispersed silicic acid	5 %	5 %	-
Kaolin	65 %	40 %	-
Talcum	-		20

- 5 The active ingredient is thoroughly mixed with the adjuvants and the mixture is thoroughly ground in a suitable mill, affording powders that can be used directly for seed treatment.

Emulsifiable concentrate

active ingredient	10 %
octylphenol polyethylene glycol ether (4-5 mol of ethylene oxide)	3 %
calcium dodecylbenzenesulfonate	3 %
castor oil polyglycol ether (35 mol of ethylene oxide)	4 %
Cyclohexanone	30 %
xylene mixture	50 %

Emulsions of any required dilution, which can be used in plant protection, can be obtained from this concentrate by dilution with water.

10

Dusts

	a)	b)	c)
Active ingredient	5 %	6 %	4 %
Talcum	95 %	-	-
Kaolin	-	94 %	-
mineral filler	-	-	96 %

Ready-for-use dusts are obtained by mixing the active ingredient with the carrier and grinding the mixture in a suitable mill. Such powders can also be used for dry dressings for seed.

Extruder granules

-33-

Active ingredient	15 %
sodium lignosulfonate	2 %
carboxymethylcellulose	1 %
Kaolin	82 %

The active ingredient is mixed and ground with the adjuvants, and the mixture is moistened with water. The mixture is extruded and then dried in a stream of air.

Coated granules

Active ingredient	8 %
polyethylene glycol (mol. wt. 200)	3 %
Kaolin	89 %

5 The finely ground active ingredient is uniformly applied, in a mixer, to the kaolin moistened with polyethylene glycol. Non-dusty coated granules are obtained in this manner.

Suspension concentrate

active ingredient	40 %
propylene glycol	10 %
nonylphenol polyethylene glycol ether (15 mol of ethylene oxide)	6 %
Sodium lignosulfonate	10 %
Carboxymethylcellulose	1 %
silicone oil (in the form of a 75 % emulsion in water)	1 %
Water	32 %

10 The finely ground active ingredient is intimately mixed with the adjuvants, giving a suspension concentrate from which suspensions of any desired dilution can be obtained by dilution with water. Using such dilutions, living plants as well as plant propagation material can be treated and protected against infestation by microorganisms, by spraying, pouring or immersion.

Flowable concentrate for seed treatment

active ingredient	40 %
propylene glycol	5 %
copolymer butanol PO/EO	2 %
tristyrenephenole with 10-20 moles EO	2 %
1,2-benzisothiazolin-3-one (in the form of a 20% solution in	0.5 %

-34-

water)

monoazo-pigment calcium salt	5 %
Silicone oil (in the form of a 75 % emulsion in water)	0.2 %
Water	45.3 %

The finely ground active ingredient is intimately mixed with the adjuvants, giving a suspension concentrate from which suspensions of any desired dilution can be obtained by dilution with water. Using such dilutions, living plants as well as plant propagation material can be treated and protected against infestation by microorganisms, by spraying, pouring or immersion.

5

In a preferred embodiment, each of the pesticidal combination of the present invention is a plant propagation material, preferably seed, treating composition.

Using such formulations either straight or diluted plant propagation material can be treated and protected against damage, for example, from pathogen(s), by, for example, spraying, pouring or immersing.

10

The compound I and/or II and pesticidal combinations thereof are distinguished by the fact that they are especially well tolerated by plants and are environmentally friendly.

15

The present invention relates to an enantiomer, diastereomer, or salt, thereof of each compound described herein.

In each aspect and embodiment of the invention, "consisting essentially" and inflections thereof are a preferred embodiment of "comprising" and its inflections, and "consisting of" and inflections thereof are a preferred embodiment of "consisting essentially of" and its inflections.

20

The following Examples are given by way of illustration and not by way of limitation of the invention.

25

Examples

1. Preparation of 3-Amino-4-chlorobenzo[d]isothiazole-1,1-dioxide (compound P1.5):

12.5 ml of a 25% ammonia is added at approx 60°C to a solution of 11.8 g of 2-cyano-3-chlorobenzenesulfonylchloride in 20 ml of dioxane. After heating on a steam bath for 30

30

-35-

minutes the reaction mixture is cooled and diluted with water. The resulting crystalline product is sucked off, washed with water and dried. After recrystallisation from ethanol, the product melts at 261-263°C.

- 5 3-Amino-4-methoxybenzo[d]isothiazole-1,1-dioxide (m.p. 270°C) is prepared in corresponding manner (compound P1.1).

2. Preparation of 3-Acetylamino-4-methoxybenzo[d]isothiazole-1,1-dioxide (compound P1.8):

- 10 6.66 g 3-acetylamino-4-methoxybenzo[d]isothiazole is suspended in 150 ml chloroform. 10.35 g m-chloroperbenzoic acid is added to the mixture at 20-30°C in portions. The reaction mixture is stirred overnight, solids are filtered off and the filtrate is concentrated. The crude product is purified by column chromatography (SiO₂, methylenechloride-isopropanol). 3-Acetylamino-4-methoxybenzo[d]isothiazole-1,1-dioxide is obtained as colorless crystals with a m.p. of 242-245°C.

15

Comparative Example 1

Compounds α , β and χ disclosed in WO07/057407 (specifically identified in Table C, Nos. 7, 15 and 23 respectively) are compared for biological efficacy against compounds P1.1, P1.5, P1.6 and P1.32 of the present invention.

20

B1: *Myzus persicae* (green peach aphid) (mixed population, sachet test)

Each well of a 24-well microtiter plate is filled with 0.6ml 30% sucrose solution, containing 12.5 ppm of the test compounds. For producing the sachets, the wells are covered with stretched parafilm and infested with a mixed population of *Myzus persicae*. 6 days after the infestation, samples are checked for mortality (feeding activity).

25

Compounds β and χ did not show activity, whereas compound α gives 80% control of *Myzus persicae*. In contrast, compounds P1.1, P1.5 and P1.6 give 100% control of *Myzus persicae*.

- 30 B2: *Myzus persicae* (green peach aphid) (mixed population, systemic/feeding activity, curative)

Roots of pea seedlings, infested with an aphid population of mixed ages, are placed directly in the test solutions of 6 ppm. 6 days after introduction, samples are checked for mortality and special effects on the plant.

-36-

Compound α gives 50% control of *Myzus persicae*. In contrast, compound P1.32 gives 80% control, and compounds P1.1, P1.5 and P1.6 give 100% control, of *Myzus persicae*.

Example 1

5

Sugarbeet seeds are treated with P1.1, P1.5, P1.6, P1.8, P1.32 or P1.38 at rates of 0.1, 0.3 and 0.6 mg a.i. /seed. The seeds are sown into 9-cm pots filled with 280 mL of soil. After placing the seeds on the soil surface they are covered with 50 mL of soil. Before and during the bioassays, the plants are grown in greenhouse chambers at 25 °C during daytime, 23 °C during night, 50-60 % rH, a 14-hour photoperiod and artificial lighting when natural light fell below 20 kLux. After sowing, the pots are transferred to the greenhouse chambers, set up in a random fashion and are irrigated as necessary from above. After 14 days, the plants are infested with African bean aphid (*Aphis craccivora*) by placing one infested pea seedling containing approximately 150 aphids of a population of mixed developmental stages onto each plant. Seven days after infestation, the number of aphids is counted per plant. Each treatment group is replicated 10 times. Each replicate contains 1 plant. The table below shows the reduction of aphids compared to the untreated control plants.

Table: Reduction of African bean aphid exposed to sugarbeet plants grown from seeds treated with compounds P1.1, P1.5, P1.6, P1.8, P1.32 or P1.38

mg/seed	Efficacy, % P1.1	Efficacy, % P1.5	Efficacy, % P1.6	Efficacy, % P1.8	Efficacy, % P1.32	Efficacy, % P1.38
0.1	41	87	83	8	93	67
0.3	69			72	99	96
0.6	92			95	98	98

20

Example 2

Chinese cabbage seeds are treated with P1.1, P1.5, P1.6, P1.8, P1.32 or P1.38 at rates of 0.3 and 0.6 mg a.i. /seed. The seeds are sown into 9-cm pots filled with 280 mL of soil. After placing the seeds on the soil surface they are covered with 50 mL of soil. Before and during the bioassays, the plants are grown in greenhouse chambers at 25 °C during daytime, 23 °C during night, 50-60 % rH, a 14-hour photoperiod and artificial lighting when natural light fell below 20 kLux. After sowing, the pots are transferred to the greenhouse chambers, set up in a random fashion and are irrigated as necessary from above. After 14 days, the plants are

25

-37-

infested with cabbage aphid (*Myzus persicae*) by placing one infested pea seedling containing approximately 150 aphids of a population of mixed developmental stages onto each plant. Seven days after infestation, the number of aphids is counted per plant. Each treatment group is replicated 10 times. Each replicate contains 1 plant. The table below shows the reduction of aphids compared to the untreated control plants.

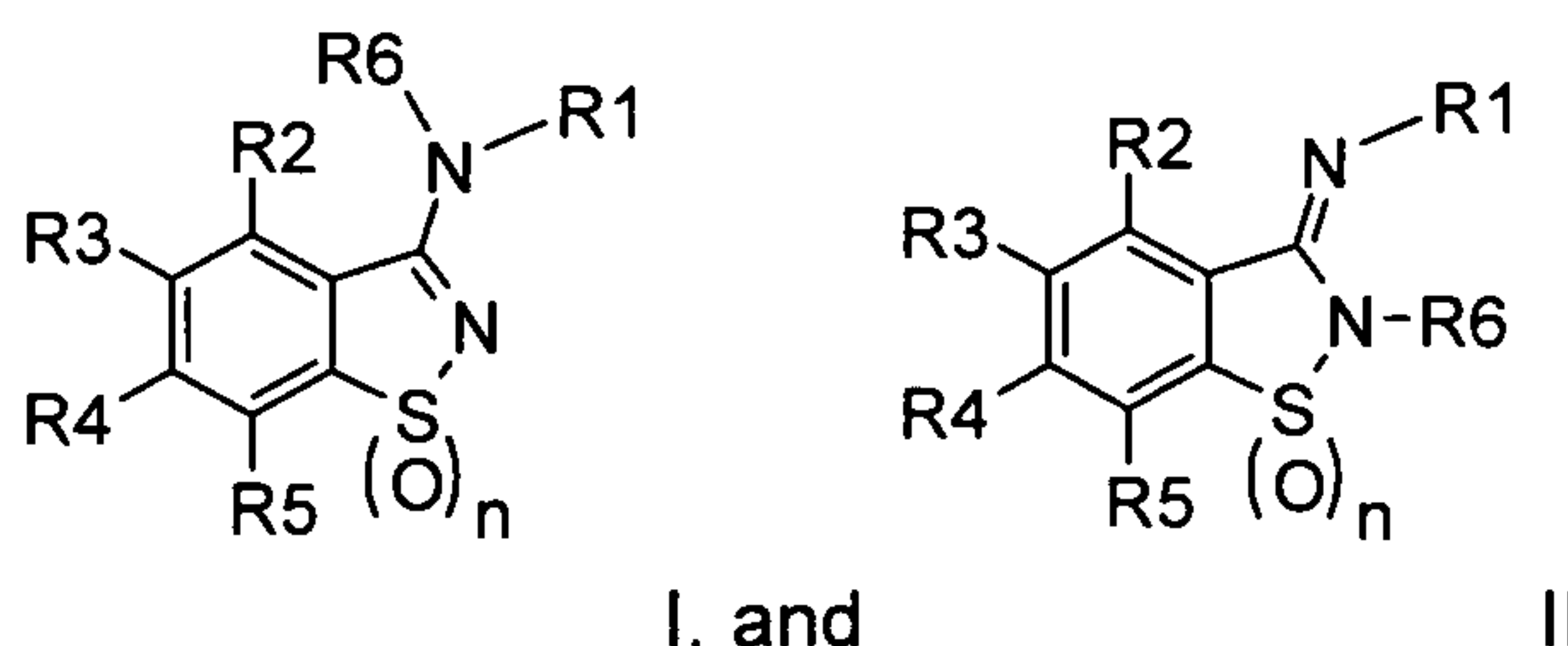
Table: Reduction of cabbage aphid exposed to Chinese cabbage plants grown from seeds treated with compounds P1.1, P1.5, P1.6, P1.8, P1.32 or P1.38

mg/seed	Efficacy, % P1.1	Efficacy, % P1.5	Efficacy, % P1.6	Efficacy, % P1.8	Efficacy, % P1.32	Efficacy, % P1.38
0.3	10	11	17	0	5	0
0.6	45	64	69	28	52	20

-38-

CLAIMS

1. A method of controlling or preventing pest damage in a plant propagation material, a plant, and/or plant organs that grow at a later point in time, which comprises applying on the
 5 plant propagation material or locus thereof a compound I or II represented by formula



wherein

10 R1 is H and R6 is represented by (C₁-C₄)alkyl or (C₂-C₄)alkenyl, or R1 is H, (C₁-C₅)alkyl, (C₁-C₄)haloalkyl, (C₁-C₄)hydroxyalkyl, (C₁-C₄)alkoxy, R₇C(O), R₈NHC(O) or R₉R₁₀N and R6 is represented by H or R₇C(O);

R2 is represented by H, halogen, (C₁-C₅)alkyl, (C₁-C₅)haloalkyl, (C₁-C₅)alkoxy, (C₁-C₅)haloalkoxy, or phenoxy;

15 R3 to R5 is, independently of each other, represented by H, halogen, (C₁-C₅)alkyl, (C₁-C₅)alkoxy, (C₁-C₅)haloalkyl, or NO₂;

R7 is represented by optionally substituted alkyl (preferably (C₁-C₅)alkyl and (C₁-C₅)haloalkyl), (C₁-C₄)haloalkoxy(C₁-C₄)haloalkyl or optionally substituted phenyl;

R8 is represented by optionally substituted phenyl, (C₁-C₄)alkyl, or (C₃-C₇)cycloalkyl;

20 R9 and R10 is, independently of each other, represented by H or (C₁-C₄)alkyl; and

n is either 0 or 2, preferably 2; provided that when R1 and R6 are each R₇C(O), R2 is a halogen;

or an enantiomer, diastereomer, or salt, thereof.

25 2. The method according to claim 1 wherein in formula I R1 is represented by H or R₇CO and R6 is represented by H.

3. The method according to either claim 1 wherein in formula II R1 is represented by H and R6 is represented by (C₁-C₄)alkyl.

-39-

4. The method according to any one of claims 1 to 3 wherein R2 is represented by hydrogen, halogen, (C₁-C₅)alkyl, (C₁-C₅)alkoxy, or (C₁-C₅)haloalkoxy.

5. The method according to any one of claims 1 to 4 wherein R3 to R5 are each H.

6. The method according to claim 2 wherein R7 is (C₁ to C₃)alkyl.

7. The method according to any one of claims 1 to 6 wherein the compound is applied on the plant propagation material before planting or sowing thereof.

8. The method according to any one of claims 1 to 7 wherein the pest is selected from one or representatives of the class Insecta, class Arachnida and class Nematoda.

9. A method of protecting a plant propagation material, a plant, and/or plant organs that grow at a later point in time against pest damage by applying to the plant propagation material or locus thereof a compound of formula I or II defined in any one of claims 1 to 6.

10. A method of improving the growing characteristics of a plant, which comprises applying to a plant propagation material or locus thereof a compound of formula I or II defined in any one of claims 1 to 6.

11. The method according to any one of claim 1 to 10 wherein one or more pesticides, selected from fludioxonil, penthiopyrad, prothioconazole, flutriafol, difenoconazole, azoxystrobin, captan, cyproconazole, cyprodinil, boscalid, diniconazole, epoxiconazole, fluoxastrobin, trifloxystrobin, metalaxyl, metalaxyl-M (mefenoxam), fluquinconazole, fenarimol, nuarimol, pyrifenox, pyraclostrobin, thiabendazole, tebuconazole, triadimenol, benalaxyl, benalaxyl-M, benomyl, carbendazim, carboxin, flutolanil, fuberizadole, guazatine, myclobutanil, tetraconazole, imazalil, metconazole, bitertanol, cymoxanil, ipconazole, iprodione, prochloraz, pencycuron, propamocarb, silthiofam, thiram, triazoxide, triticonazole, tolylfluanid, a manganese compound (such as mancozeb, maneb), a compound of formula A, compound of formula B, thiamethoxam, imidacloprid, clothianidin, lamda-cyhalothrin, tefluthrin, β -cyfluthrin, permethrin, chloranthraniliprole, abamectin, fipronil, and spinosad, is/are also applied on the plant propagation material in a combination with the compound I or II defined in any one of claims 1 to 6, in any desired sequence or simultaneously.

-40-

12. The method according to claim 11 wherein the combination is in the form of a composition.

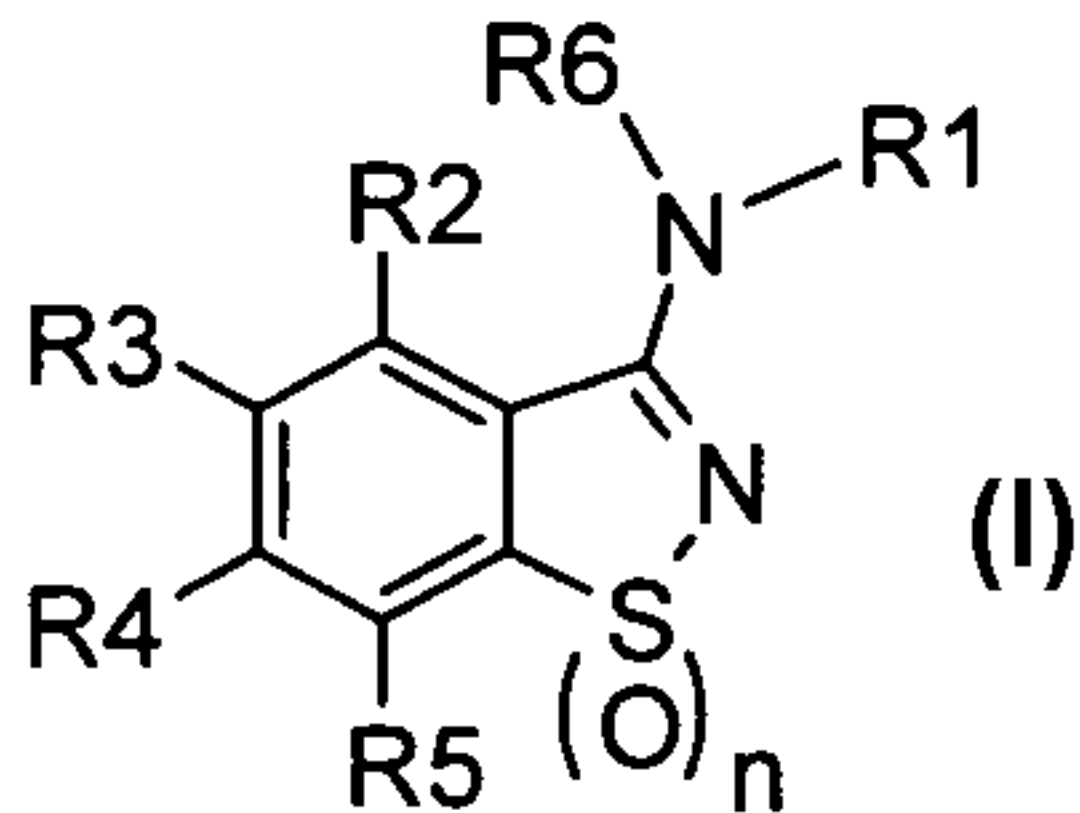
5 13. The method according to either claim 11 or 12, wherein if the pesticide is a fungicide, then the method controls or prevents pathogenic damage and pest damage.

14. The method according to any one of claims 1 to 13, wherein the plant propagation material is a seed.

10

15. A plant propagation material treatment composition comprising a compound I or II defined in any one of claims 1 to 6 or a pesticidal combination defined in either claim 11 or 12, and optionally one or more customary formulation auxiliaries.

15 16. A plant propagation material treated with the composition defined in claim 15.



and

