

Subject: pesticides may be harming salmon

August 10 2010

Submission to the Cohen Commission

Thank You for your investigation into the decline of sockeye salmon.

The following is a list of pesticides that are in our environment. I found this extensive list of pesticides on a website that is selling a patent process that allows someone to identify pesticide residue. The article is called: Method For Determining Pesticide Residues in Soil or Plant Material. I have never before seen one list of pesticides that can be found in our environment. I hope the Commissioner will consider the impact of drowning our planet with chemicals - not as scientists but a human inhabitant of planet Earth. I think we can recognize this list as a big problem facing salmon.

Based on chemical classes, pesticides include in particular acylalanine fungicides, acylamino acid fungicides, aliphatic amide organothiophosphate insecticides, aliphatic nitrogen fungicides, aliphatic organothiophosphate insecticides, amide fungicides, amide herbicides, anilide fungicides, anilide herbicides, antiauxins, antibiotic acaricides, antibiotic fungicides, antibiotic herbicides, antibiotic insecticides, antibiotic nematicides, aromatic acid herbicides, aromatic fungicides, arsenical herbicides, arsenical insecticides, arylalanine herbicides, aryloxyphenoxypropionic herbicides, auxins, avermectin acaricides, avermectin insecticides, benzamide fungicides, benzanilide fungicides, benzimidazole fungicides, benzimidazole precursor fungicides, benzimidazolylcarbamate fungicides, benzofuranyl alkylsulfonate herbicides, benzofuranyl methylcarbamate insecticides, benzoic acid herbicides, benzothiazole fungicides, benzothiopyran organothiophosphate insecticides, benzotriazine organothiophosphate insecticides, benzoylcyclohexanedione herbicides, bipyridylum herbicides, botanical insecticides, botanical rodenticides, bridged diphenyl acaricides, bridged diphenyl fungicides, carbamate acaricides, carbamate fungicides, carbamate herbicides, carbamate insecticides, carbamate nematicides, carbanilate fungicides, carbanilate herbicides, chitin synthesis inhibitors, chloroacetanilide herbicides, chloronicotinyl insecticides, chloropyridine herbicides, chlorotriazine herbicides, conazole fungicides, copper fungicides, coumarin rodenticides, cyclic dithiocarbamate fungicides, cyclodiene insecticides, cyclohexene oxime herbicides, cyclopropylisoxazole herbicides, cytokinins, defoliants, diacylhydrazine insecticides, dicarboximide fungicides, dicarboximide herbicides, dichlorophenyl dicarboximide fungicides, dimethylcarbamate insecticides, dinitroaniline herbicides, dinitrophenol acaricides, dinitrophenol fungicides, dinitrophenol herbicides, dinitrophenol insecticides, diphenyl ether herbicides, dithiocarbamate fungicides, dithiocarbamate herbicides, ethylene releasers, fluorine insecticides, formamidine acaricides, formamidine insecticides, fumigant insecticides, furamide fungicides, furanilide fungicides, gibberellins, growth inhibitors, growth retardants, growth stimulators, halogenated aliphatic herbicides, heterocyclic organothiophosphate insecticides, imidazole fungicides, imidazolinone herbicides, indandione rodenticides, inorganic fungicides, inorganic herbicides, inorganic insecticides, inorganic mercury fungicides, inorganic rodenticides, insect growth regulators, isoindole organothiophosphate insecticides, isoxazole organothiophosphate insecticides, juvenile hormone mimics, juvenile hormones,

macrocyclic lactone acaricides, macrocyclic lactone insecticides, mercury fungicides, methoxytriazine herbicides, methylthiotriazine herbicides, milbemycin acaricides, milbemycin insecticides, mite growth regulators, morphactins, morpholine fungicides, moulting hormone agonists, moulting hormones, moulting inhibitors, nereistoxin analogue insecticides, nicotinoid insecticides, nitrile herbicides, nitroguanidine insecticides, nitromethylene insecticides, nitrophenyl ether herbicides, organochlorine acaricides, organochlorine insecticides, organochlorine rodenticides, organomercury fungicides, organophosphate acaricides, organophosphate insecticides, organophosphate nematocides, organophosphorus acaricides, organophosphorus fungicides, organophosphorus herbicides, organophosphorus insecticides, organophosphorus nematocides, organophosphorus rodenticides, organothiophosphate acaricides, organothiophosphate insecticides, organothiophosphate nematocides, organotin acaricides, organotin fungicides, oxadiazine insecticides, oxathiin fungicides, oxazole fungicides, oxime carbamate acaricides, oxime carbamate insecticides, oxime carbamate nematocides, oxime organothiophosphate insecticides, phenoxy herbicides, phenoxyacetic herbicides, phenoxybutyric herbicides, phenoxypropionic herbicides, phenyl ethylphosphonothioate insecticides, phenyl methylcarbamate insecticides, phenyl organothiophosphate insecticides, phenyl phenylphosphonothioate insecticides, phenylenediamine herbicides, phenyl pyrazolyl ketone herbicides, phenylsulfamide acaricides, phenylsulfamide fungicides, phenylurea herbicides, phosphonate acaricides, phosphonate insecticides, phosphonothioate insecticides, phosphoramidate insecticides, phosphoramidothioate acaricides, phosphoramidothioate insecticides, phosphorodiamide acaricides, phosphorodiamide insecticides, phthalic acid herbicides, phthalimide acaricides, phthalimide fungicides, phthalimide insecticides, picolinic acid herbicides, polymeric dithiocarbamate fungicides, polysulfide fungicides, precocenes, pyrazole acaricides, pyrazole fungicides, pyrazole insecticides, pyrazolopyrimidine organothiophosphate insecticides, pyrazolyloxyacetophenone herbicides, pyrazolylphenyl herbicides, pyrethroid acaricides, pyrethroid ester acaricides, pyrethroid ester insecticides, pyrethroid ether acaricides, pyrethroid ether insecticides, pyrethroid insecticides, pyridazine herbicides, pyridazinone herbicides, pyridine fungicides, pyridine herbicides, pyridine organothiophosphate insecticides, pyridylmethanamine insecticides, pyrimidinamine acaricides, pyrimidinamine insecticides, pyrimidinamine rodenticides, pyrimidine fungicides, pyrimidine organothiophosphate insecticides, pyrimidinediamine herbicides, pyrimidinylbenzoic acid herbicides, pyrimidinylsulfonamide herbicides, pyrimidinylthiobenzoic acid herbicides, pyrrole acaricides, pyrrole fungicides, pyrrole insecticides, quaternary ammonium herbicides, quinoline fungicides, quinolinecarboxylic acid herbicides, quinone fungicides, quinoxaline acaricides, quinoxaline fungicides, quinoxaline organothiophosphate insecticides, strobilurin fungicides, sulfite ester acaricides, sulfonamide fungicides, sulfonamide herbicides, sulfonanilide fungicides, sulfonanilide herbicides, sulfonamide herbicides, tetrazine acaricides, tetronic acid acaricides, tetronic acid insecticides, thiadiazole organothiophosphate insecticides, thiadiazolylurea herbicides, thiazole fungicides, thiocarbamate acaricides, thiocarbamate fungicides, thiocarbamate herbicides, thiocarbonate herbicides, thiophene fungicides, thiourea acaricides, thiourea herbicides, thiourea rodenticides, triazine fungicides, triazine herbicides, triazinone herbicides, triazinylsulfonamide herbicides, triazole fungicides, triazole herbicides, triazole organothiophosphate insecticides, triazolone herbicides,

triazolopyrimidine herbicides, uracil herbicides, urea fungicides, urea herbicides, urea insecticides, urea rodenticides, valinamide fungicides, xylylalanine fungicides.

Herbicides include, amide herbicides, such as allidochlor, beflubutamid, benzadox, benzipram, bromobutide, cafenstrole, CDEA, chlorthiamid, cyprazole, dimethenamid, dimethenamid-P, diphenamid, epronaz, etnipromid, fentrazamide, flupoxam, fomesafen, halosafen, isocarbamid, isoxaben, napropamide, naptalam, pethoxamid, propyzamide, quinonamid, tebutam; especially anilide herbicides, such as chloranocryl, cisanilide, clomeprop, cypromid, diflufenican, etobenzanid, fenasulam, flufenacet, flufenican, mefenacet, mefluidide, metamifop, monalide, naproanilide, pentanochlor, picolinafen, propanil; in particular arylalanine herbicides, such as benzoylprop, flamprop, flamprop-M; chloroacetanilide herbicides, such as acetochlor, alachlor, butachlor, butenachlor, delachlor, diethatyl, dimethachlor, metazachlor, metolachlor, S-metolachlor, pretilachlor, propachlor, propisochlor, prynachlor, terbuchlor, thenylchlor, xylachlor; and sulfonanilide herbicides, such as benzofluor, cloransulam, diclosulam, florasulam, flumetsulam, metosulam, perfluidone, pyrimisulfan, profluazol; and sulfonamide herbicides, such as asulam, carbasulam, fenasulam, oryzalin, penoxsulam; antibiotic herbicides, such as bilanafos; aromatic acid herbicides; especially benzoic acid herbicides, such as chloramben, dicamba, 2,3,6-TBA, tricamba; in particular pyrimidinylxybenzoic acid herbicides, such as bispyribac, pyriminobac; and pyrimidinylthiobenzoic acid herbicides, such as pyriithiobac; phthalic acid herbicides, such as chlorthal; picolinic acid herbicides, such as aminopyralid, clopyralid, picloram; and quinolinecarboxylic acid herbicides, such as quinclorac, quinmerac; arsenical herbicides, such as cacodylic acid, CMA, DSMA, hexaflurate, MAA, MAMA, MSMA, potassium arsenite, sodium arsenite; benzoylcyclohexanedione herbicides, such as mesotrione, sulcotrione; benzofuranyl alkylsulfonate herbicides, such as benfuresate, ethofumesate; carbamate herbicides, such as asulam, carboxazole, chlorprocarb, dichlormate, fenasulam, karbutilate, terbucarb; carbanilate herbicides, such as barban, BCPC, carbasulam, carbetamide, CEPC, chlorbufam, chlorpropham, CPPC, desmedipham, phenisopham, phenmedipham, phenmedipham-ethyl, propham, swep; cyclohexene oxime herbicides, such as alloxymid, butoxydim, clethodim, cloproxydim, cycloxydim, profoxydim, sethoxydim, tepraloxymid, tralkoxydim; cyclopropylisoxazole herbicides, such as isoxachlortole, isoxaflutole; dicarboximide herbicides, such as benzfendizone, cinidon-ethyl, flumezin, flumiclorac, flumioxazin, flumipropyn; dinitroaniline herbicides, such as benfluralin, butralin, dinitramine, ethalfluralin, fluchloralin, isopropalin, methalpropalin, nitralin, oryzalin, pendimethalin, prodiamine, profluralin, trifluralin; dinitrophenol herbicides, such as dinofenate, dinoprop, dinosam, dinoseb, dinoterb, DNOC, etinofen, medinoterb; diphenyl ether herbicides, such as ethoxyfen; especially nitrophenyl ether herbicides, such as acifluorfen, aclonifen, bifenox, chlomethoxyfen, chlornitrofen, etnipromid, fluorodifen, fluoroglycofen, fluoronitrofen, fomesafen, furyloxyfen, halosafen, lactofen, nitrofen, nitrofluorfen, oxyfluorfen; dithiocarbamate herbicides, such as dazomet, metam; halogenated aliphatic herbicides, such as alorac, chloropon, dalapon, flupropanate, hexachloroacetone, iodomethane, methyl bromide, monochloroacetic acid, SMA, TCA; imidazolinone herbicides, such as imazamethabenz, imazamox, imazapic, imazapyr, imazaquin, imazethapyr; inorganic herbicides, such as ammonium sulfamate, borax, calcium chlorate, copper sulfate, ferrous sulfate, potassium azide, potassium cyanate, sodium azide, sodium

chlorate, sulfuric acid; nitrile herbicides, such as bromobonil, bromoxynil, chloroxynil, dichlobenil, iodobonil, ioxynil, pyraclonil; organophosphorus herbicides, such as amiprofos-methyl, anilofos, bensulide, bilanafos, butamifos, 2,4-DEP, DMPA, EBEP, fosamine, glufosinate, glyphosate, piperophos; phenoxy herbicides, such as bromofenoxim, clomeprop, 2,4-DEB, 2,4-DEP, difenopenten, disul, erbon, etnipromid, fenteracol, trifopsime; especially phenoxyacetic herbicides, such as 4-CPA, 2,4-D, 3,4-DA, MCPA, MCPA-thioethyl, 2,4,5-T; phenoxybutyric herbicides, such as 4-CPB, 2,4-DB, 3,4-DB, MCPB, 2,4,5-TB; and phenoxypropionic herbicides, such as cloprop, 4-CPP, dichlorprop, dichlorprop-P, 3,4-DP, fenoprop, mecoprop, mecoprop-P; in particular aryloxyphenoxypropionic herbicides, such as chlorazifop, clodinafop, clofop, cyhalofop, diclofop, fenoxaprop, fenoxaprop-P, fenthiaprop, fluazifop, fluazifop-P, haloxyfop, haloxyfop-P, isoxapyrifop, metamifop, propaquizafop, quizalofop, quizalofop-P, trifop; phenylenediamine herbicides, such as dinitramine, prodiamine; phenyl pyrazolyl ketone herbicides, such as benzofenap, pyrazolynate, pyrazoxyfen, topramezone; pyrazolylphenyl herbicides, such as fluazolate, pyraflufen; pyridazine herbicides, such as credazine, pyridafol, pyridate; pyridazinone herbicides, such as brompyrazon, chloridazon, dimidazon, flufenpyr, mefflurazon, norflurazon, oxapyrazon, pydanon; pyridine herbicides, such as aminopyralid, cliodinate, clopyralid, dithiopyr, fluoroxypr, haloxydine, picloram, picolinafen, pyriclor, thiazopyr, triclopyr; pyrimidinediamine herbicides, such as iprymidam, tioclorim; quaternary ammonium herbicides, such as cyperquat, diethamquat, difenzoquat, diquat, morfamquat, paraquat; thiocarbamate herbicides, such as butylate, cycloate, di-allate, EPTC, esprocarb, ethiolate, isopolinate, methiobencarb, molinate, orbencarb, pebulate, prosulfocarb, pyributicarb, sulfallate, thiobencarb, tiocarbazil, tri-allate, vernolate; thiocarbonate herbicides, such as dimexano, EXD, proxan; thiourea herbicides, such as methiuron; triazine herbicides, such as dipropetryn, triaziflam, trihydroxytriazine; especially chlorotriazine herbicides, such as atrazine, chlorazine, cyanazine, cyprazine, eglinazone, ipazine, mesoprazine, procyazine, proglinazone, propazine, sebuthylazine, simazine, terbuthylazine, trietazine; methoxytriazine herbicides, such as atraton, methometon, prometon, sebumeton, simeton, terbumeton; and methylthiotriazine herbicides, such as ametryn, aziprotryne, cyanatryn, desmetryn, dimethametryn, methoprotryne, prometryn, simetryn, terbutryn; triazinone herbicides, such as ametridione, amibuzin, hexazinone, isomethiozin, metamitron, metribuzin; triazole herbicides, such as amitrole, cafenstrole, epronaz, flupoxam; triazolone herbicides, such as amicarbazone, carfentrazone, flucarbazone, propoxycarbazone, sulfentrazone; triazolopyrimidine herbicides, such as cloransulam, diclosulam, florasulam, flumetsulam, metosulam, penoxsulam; uracil herbicides, such as butafenacil, bromacil, flupropacil, isocil, lenacil, terbacil; urea herbicides, such as benzthiazuron, cumyluron, cycluron, dichloralurea, diflufenzopyr, isonoruron, isouron, methabenzthiazuron, monisouron, noruron; especially phenylurea herbicides, such as anisuron, buturon, chlorbromuron, chloreturon, chlorotoluron, chloroxuron, daimuron, difenoxuron, dimefuron, diuron, fenuron, fluometuron, fluothiuron, isoproturon, linuron, methiuron, methylodymron, metobenzuron, metobromuron, metoxuron, monolinuron, monuron, neburon, parafluoron, phenobenzuron, siduron, tetrafluoron, thidiazuron; sulfonylurea herbicides; in particular pyrimidinylsulfonylurea herbicides, such as amidosulfuron, azimsulfuron, bensulfuron, chlorimuron, cyclosulfamuron, ethoxysulfuron, flzasulfuron, flucetosulfuron, flupyrulfuron, foramsulfuron, halosulfuron, imazosulfuron, mesosulfuron, nicosulfuron, orthosulfamuron, oxasulfuron,

primisulfuron, pyrazosulfuron, rimsulfuron, sulfometuron, sulfosulfuron, trifloxysulfuron; and triazinylsulfonylurea herbicides, such as chlorsulfuron, cinosulfuron, ethametsulfuron, iodosulfuron, metsulfuron, prosulfuron, thifensulfuron, triasulfuron, tribenuron, triflusulfuron, tritosulfuron; and thiadiazolylurea herbicides, such as buthiuron, ethidimuron, tebuthiuron, thiazafluron, thidiazuron; and unclassified herbicides, such as acrolein, allyl alcohol, azafenidin, benazolin, bentazone, benzobicyclon, buthidazole, calcium cyanamide, cambendichlor, chlorfenac, chlorfenprop, chlorflurazole, chlorflurenol, cinmethylin, clomazone, CPMF, cresol, ortho-dichlorobenzene, dimepiperate, endothal, fluoromidine, fluridone, fluorochloridone, flurtamone, fluthiacet, indanofan, methazole, methyl isothiocyanate, nipyraclufen, OCH, oxadiargyl, oxadiazon, oxaziclomefone, pentachlorophenol, pentoxazone, phenylmercury acetate, pinoxaden, prosulfalin, pyribenzoxim, pyriftalid, quinoclamine, rhodethanil, sulglycapin, thidiazimin, tridiphane, trimeturon, tripropindan, tritac.

herbicides include: 1,3,4-thiadiazoles, such as buthidazole and cyprazole; amides, such as allidochlor, benzoylprop-ethyl, bromobutide, chlorthiamid, dimepiperate, dimethenamid, diphenamid, etobenzanid, flamprop, flamprop-methyl, fosamine, isoxaben, metazachlor, monalide, naptalam, pronamide, propanil, propyzamide, quinonamid; aminotriazoles, such as amitrole, anilides, such as anilofos, mefenacet, pentanochlor; aryloxyalkanoic acids, such as 2,4-D, 2,4-DB, clomeprop, dichlorprop, dichlorprop-P, fenoprop, fluoroxypyr, MCPA, MCPB, mecoprop, mecoprop-P, napropamide, napropanilide, triclopyr; benzoic acids, such as chloramben, dicamba; benzothiadiazinones, such as bentazone; bleachers, such as clomazone, diflufenican, fluorochloridone, flupoxam, fluridone, karbutilate, pyrazolate, sulcotrione, mesotrione; carbamates, such as asulam, carbetamide, chlorbufam, chlorpropham, desmedipham, phenmedipham, vernolate; quinolinic acids, such as quinclorac, quinmerac; dichloropropionic acids, such as dalapon; dihydrobenzofurans, such as ethofumesate; dihydrofuran-3-ones, such as flurtamone; dinitroanilines, such as benefin, butralin, dinitramine, ethalfluralin, fluchloralin, isopropalin, nitralin, oryzalin, pendimethalin, prodiamine, profluralin, trifluralin; dinitrophenols, such as bromofenoxim, dinoseb, dinoseb-acetate, dinoterb, DNOC, minoterb-acetate; diphenyl ethers, such as acifluorfen, acifluorfen-sodium, aclonifen, bifenox, chlornitrofen, difenoxuran, ethoxyfen, fluorodifen, fluoroglycofen-ethyl, fomesafen, furyloxyfen, lactofen, nitrofen, nitrofluorfen, oxyfluorfen; ureas, such as benzthiazuron, DCU, diflufenzopyr, methabenzthiazuron; imidazolinones, such as imazamethapyr, imazapyr, imazaquin, imazethabenz-methyl, imazethapyr, imazapic, imazamox; oxadiazoles, such as methazole, oxadiargyl, oxadiazon; oxiranes, such as tridiphane; phenols, such as bromoxynil, ioxynil; phenoxyphenoxypropionic acid esters, such as clodinafop, cyhalofop-butyl, diclofop-methyl, fenoxaprop-ethyl, fenoxaprop-p-ethyl, fenthiaprop-ethyl, fluazifop-butyl, fluazifop-p-butyl, haloxyfop-ethoxyethyl, haloxyfop-methyl, haloxyfop-p-methyl, isoxapyrifop, propaquizafop, quizalofop-ethyl, quizalofop-p-ethyl, quizalofop-tefuryl; phenylacetic acids, such as chlorfenac; phenylureas, such as buturon, chlorotoluron, chlorbromuron, chloroxuron, dimefuron, diuron, fenuron, isoproturon, linuron, monolinuron, monuron, metobenzuron, metobromuron, metoxuron, neburon; phenylpropionic acids, such as chlorophenprop-methyl; ppi-active compounds, such as benzofenap, flumiclorac, flumiclorac-pentyl, flumioxazine, flumipropyn, flupropacil, pyrazoxyfen, sulfentrazone, thidiazimin; pyrazoles, such as nipyraclufen; pyridoxines, such as chloridazon, maleic

hydrazide, norflurazon, pyridate; pyridinecarboxylic acids, such as clopyralid, dithiopyr, picloram, thiazopyr; pyrimidyl ethers, such as pyriithiobac-acid, pyriithiobac-sodium, KIH-2023, KIH-6127; sulfonamides, such as flumetsulam, metosulam; sulfonylureas, such as amidosulfuron, azimsulfuron, bensulfuron-methyl, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethoxysulfuron, ethametsulfuron-methyl, flazasulfuron, flupyralsulfuron-methyl, foramsulfuron, halosulfuron-methyl, imazosulfuron, iodosulfuron, metsulfuron-methyl, nicosulfuron, oxasulfuron, primisulfuron, prosulfuron, pyrazosulfuron-ethyl, rimsulfuron, sulfometuron-methyl, sulfosulfuron, thifensulfuron-methyl, triasulfuron, tribenuron-methyl, triflurosulfuron-methyl, tritosulfuron; thiadiazolylureas, such as ethidimuron, tebutiuron, thiazafluron; triazines, such as ametryn, atrazine, atraton, cyanazine, cyprazine, desmetryn, dipropetryn, isomethiozin, propazine, prometryn, prometon, sebuthylazine, secbumethon, simazine, tebutryn, terbumeton, terbuthylazine, trietazine; triazolecarboxamides, such as triazofenamide; uracils, such as bromacil, butafenacil, lenacil, terbacil; furthermore azafenidin, aziprotryne, bromuron, benazolin, benfuresate, bensulide, benzofluor, bentazon, bromofenoxim, butamifos, cafenstrole, chlorthal-dimethyl, cinmethylin, cinidon-ethyl, defenuron, dichlobenil, endothall, fluorbentranyl, fluthiacet-methyl, inxynil, isoxaflutole, mefluidide, methazole, metribuzin, metramitron, perfluidone, piperophos, topramezone; crop protection agents of the cyclohexenone type, such as alloxymid, clethodim, cloproxydim, cycloxydim, sethoxydim and tralkoxydim. Particularly preferred herbicidally active compounds of the cyclohexenone type are: tepraloxymid (cf. AGROW, No. 243, 11.3.95, page 21, caloxydim) and 2-(1-[2-{4-chlorophenoxy}-propyloxyimino]butyl)-3-hydroxy-5-(2H-tetrahydr- othiopyran-3-yl)-2-cyclohexen-1-one, and a particularly preferred herbicidally active compound of the sulfonylurea type is: N-((4-methoxy-6-[trifluoromethyl]-1,3,5-triazin-2-yl)amino)carbonyl)-2-(trifluoromethyl)benzenesulfonamide.

Fungicides include, aliphatic nitrogen fungicides, such as butylamine, cymoxanil, dodicyn, dodine, guazatine, iminoctadine; amide fungicides, such as carpropamid, chloraniformethan, cyflufenamid, diclocymet, ethaboxam, fenoxanil, flumetover, furametpyr, mandipropamid, penthiopyrad, prochloraz, quinazamid, silthiofam, triforine; especially acylamino acid fungicides, such as benalaxyl, benalaxyl-M, furalaxyl, metalaxyl, metalaxyl-M, pefurazoate; anilide fungicides, such as benalaxyl, benalaxyl-M, boscalid, carboxin, fenhexamid, metalaxyl, metalaxyl-M, metsulfovax, ofurace, oxadixyl, oxycarboxin, pyracarbolid, thifluzamide, tiadinil; in particular benzanilide fungicides, such as benodanil, flutolanil, mebenil, mepronil, salicylanilide, tecloftalam; furanilide fungicides, such as fenfuram, furalaxyl, furcarbanil, methfuroxam; and sulfonanilide fungicides, such as flusulfamide; benzamide fungicides, such as benzohydroxamic acid, fluopicolide, tioxymid, trichlamide, zarilamid, zoxamide; furamide fungicides, such as cyclafuramid, furmecyclox; phenylsulfamide fungicides, such as dichlofluanid, tolylfluanid; sulfonamide fungicides, such as cyazofamid; and valinamide fungicides, such as benthiavalicarb, iprovalicarb; antibiotic fungicides, such as aureofungin, blasticidin-S, cycloheximide, griseofulvin, kasugamycin, natamycin, polyoxins, polyoxorim, streptomycin, validamycin; especially strobilurin fungicides, such as azoxystrobin, dimoxystrobin, fluoxastrobin, kresoxim-methyl, metominostrobin, orysastrobin, picoxystrobin, pyraclostrobin, trifloxystrobin; aromatic fungicides, such as biphenyl, chlorodinitronaphthalene, chloroneb, chlorothalonil, cresol, dicloran, hexachlorobenzene, pentachlorophenol, quintozone, sodium pentachlorophenoxide,

tecnazene; benzimidazole fungicides, such as benomyl, carbendazim, chlorfenazole, cypendazole, debacarb, fuberidazole, mecarbinzid, rabenzazole, thiabendazole; benzimidazole precursor fungicides, such as furophanate, thiophanate, thiophanate-methyl; benzothiazole fungicides, such as bentaluron, chlobenthiazone, TCMTB; bridged diphenyl fungicides, such as bithionol, dichlorophen, diphenylamine; carbamate fungicides, such as benthiavalicarb, furophanate, iprovalicarb, propamocarb, thiophanate, thiophanate-methyl; especially benzimidazolylcarbamate fungicides, such as benomyl, carbendazim, cypendazole, debacarb, mecarbinzid; and carbanilate fungicides, such as diethofencarb; conazole fungicides; especially conazole fungicides (imidazoles), such as climbazole, clotrimazole, imazalil, oxpoconazole, prochloraz, triflumizole; and conazole fungicides (triazoles), such as azaconazole, bromuconazole, cyproconazole, diclobutrazol, difenoconazole, diniconazole, diniconazole-M, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, furconazole, furconazole-cis, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, penconazole, propiconazole, prothioconazole, quinconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, uniconazole, uniconazole-P; copper fungicides, such as Bordeaux mixture, Burgundy mixture, Cheshunt mixture, copper acetate, copper carbonate, basic, copper hydroxide, copper naphthenate, copper oleate, copper oxychloride, copper sulfate, copper sulfate, basic, copper zinc chromate, cufraneb, cuprobam, cuprous oxide, mancopper, oxine copper; dicarboximide fungicides, such as famoxadone, fluoroimide; especially dichlorophenyl dicarboximide fungicides, such as chlozolate, dichlozoline, iprodione, isovaledione, myclozolin, procymidone, vinclozolin; and phthalimide fungicides, such as captafol, captan, ditalimfos, folpet, thiochlorfenphim; dinitrophenol fungicides, such as binapacryl, dinobuton, dinocap, dinocap-4, dinocap-6, dinocron, dinopenton, dinosulfon, dinoterbon, DNOC; dithiocarbamate fungicides, such as azithiram, carbamorph, cufraneb, cuprobam, disulfuram, ferbam, metam, nabam, tecoram, thiram, ziram; especially cyclic dithiocarbamate fungicides, such as dazomet, etem, milneb; and polymeric dithiocarbamate fungicides, such as mancopper, mancozeb, maneb, metiram, polycarbamate, propineb, zineb; imidazole fungicides, such as cyazofamid, fenamidone, fenapanil, glyodin, iprodione, isovaledione, pefurazoate, triazoxide; inorganic fungicides, such as potassium azide, potassium thiocyanate, sodium azide, sulfur; mercury fungicides; especially inorganic mercury fungicides, such as mercuric chloride, mercuric oxide, mercurous chloride; and organomercury fungicides, such as (3-ethoxypropyl)mercury bromide, ethylmercury acetate, ethylmercury bromide, ethylmercury chloride, ethylmercury 2,3-dihydroxypropyl mercaptide, ethylmercury phosphate, N-(ethylmercury)-p-toluenesulphonanilide, hydrargaphen, 2-methoxyethylmercury chloride, methylmercury benzoate, methylmercury dicyandiamide, methylmercury pentachlorophenoxide, 8-phenylmercurioxyquinoline, phenylmercuriurea, phenylmercury acetate, phenylmercury chloride, phenylmercury derivative of pyrocatechol, phenylmercury nitrate, phenylmercury salicylate, thiomersal, tolylmercury acetate; morpholine fungicides, such as aldimorph, benzamorf, carbamorph, dimethomorph, dodemorph, fenpropimorph, flumorph, tridemorph; organophosphorus fungicides, such as ampropylfos, ditalimfos, edifenfos, fosetyl, hexylthiofos, iprobenfos, phosdiphen, pyrazophos, tolclufos-methyl, triamiphos; organotin fungicides, such as decafentin, fentin, tributyltin oxide; oxathiin fungicides, such as carboxin, oxycarboxin; oxazole fungicides, such as chlozolate, dichlozoline, drazoxolon, famoxadone, hymexazol, metazoxolon, myclozolin, oxadixyl, vinclozolin; polysulfide fungicides, such as

barium polysulfide, calcium polysulfide, potassium polysulfide, sodium polysulfide; pyrazole fungicides, such as furametpyr, penthiopyrad; pyridine fungicides, such as boscalid, buthiobate, dipyrithione, fluazinam, fluopicolide, pyridinitril, pyrifenox, pyroxychlor, pyroxyfur; pyrimidine fungicides, such as bupirimate, cyprodinil, diflumetorim, dimethirimol, ethirimol, fenarimol, ferimzone, mepanipyrim, nuarimol, pyrimethanil, triarimol; pyrrole fungicides, such as fenpiclonil, fludioxonil, fluoroimide; quinoline fungicides, such as ethoxyquin, halacrinat, 8-hydroxyquinoline sulfate, quinacetol, quinoxyfen; quinone fungicides, such as benquinox, chloranil, dichlone, dithianon; quinoxaline fungicides, such as chinomethionat, chlorquinox, thioquinox; thiazole fungicides, such as ethaboxam, etridiazole, metsulfovax, octhilinone, thiabendazole, thiadifluor, thifluzamide; thiocarbamate fungicides, such as methasulfocarb, prothiocarb; thiophene fungicides, such as ethaboxam, silthiofam; triazine fungicides, such as anilazine; triazole fungicides, such as bitertanol, fluotrimazole, triazbutil; urea fungicides, such as bentalaron, pencycuron, quinazamid; unclassified fungicides, such as acibenzolar, acypetacs, allyl alcohol, benzalkonium chloride, benzamacril, bethoxazin, carvone, chloropicrin, DBCP, dehydroacetic acid, diclomezine, diethyl pyrocarbonate, fenaminosulf, fenitropan, fenpropidin, formaldehyde, furfural, hexachlorobutadiene, iodomethane, isoprothiolane, methyl bromide, methyl isothiocyanate, metrafenone, nitrostyrene, nitrothal-isopropyl, OCH, 2-phenylphenol, phthalide, piperalin, probenazole, proquinazid, pyroquilon, sodium orthophenylphenoxide, spiroxamine, sultropen, thicyofen, tricyclazole, zinc naphthenate.

Fungicides include: acylalanines, such as benalaxyl, metalaxyl, ofurace, oxadixyl; amine derivatives, such as aldimorph, dodine, dodemorph, fenpropimorph, fenpropidin, guazatine, iminoctadine, spiroxamine, tridemorph; anilinopyrimidines, such as pyrimethanil, mepanipyrim or cyprodinil; antibiotics, such as cycloheximide, griseofulvin, kasugamycin, natamycin, polyoxin and streptomycin; azoles: azaconazole, bitertanol, bromoconazole, cyproconazole, dichlobutrazole, difenoconazole, dinitroconazole, epoxiconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, ketoconazole, hexaconazole, metconazole, myclobutanil, penconazole, propiconazole, prothioconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triflumizole, triticonazole; dicarboximides, such as iprodione, myclobutol, procymidone, vinclozolin; dithiocarbamates: ferbam, nabam, maneb, mancozeb, metam, metiram, propineb, polycarbamate, thiram, ziram, zineb; heterocyclic compounds, such as anilazine, benomyl, boscalid, carbendazim, carboxin, oxycarboxin, cyazofamid, dazomet, dithianon, famoxadone, fenamidone, fenarimol, fuberidazole, flutolanil, furametpyr, isoprothiolane, mepronil, nuarimol, probenazole, proquinazid, pyrifenox, pyroquilon, quinoxyfen, silthiofam, thiabendazole, thifluzamide, thiophenat-methyl, tiadinil, tricyclazole, triforine; nitrophenyl derivatives, such as binapacryl, dinocap, dinobuton, nitroththal-isopropyl; phenylpyrroles, such as fenpiclonil and also fludioxonil; 2-methoxybenzophenones as described in EP-A 897904 by the general formula I, for example metrafenone; fungicides not belonging to any of the other classes, such as acibenzolar-S-methyl, benthiavalicarb, carpropamid, chlorothalonil, cyflufenamid, cymoxanil, diclomezine, diclocymet, diethofencarb, edifenphos, ethaboxam, fenhexamid, fentin-acetate, fenoxanil, ferimzone, fluazinam, fosetyl, foestyl-aluminum, iprovalicarb, hexachlorobenzol, metrafenone, pencycuron, propamocarb, phthalide, toloclofos-methyl, quintozone, zoxamide; strobilurins as described in WO 03/075663 by the general formula I, for example: azoxystrobin, dimoxystrobin,

fluoxastrobin, kresoxim-methyl, metominostrobin, oryastrobin, picoxystrobin, pyraclostrobin and trifloxystrobin; sulfenic acid derivatives, such as captafol, captan, dichlofluanid, folpet, tolylfluanid; cinnamides and analogs thereof, such as dimethomorph, flumetover, flumorph; 6-aryl-[1,2,4]triazolo[1,5-a]pyrimidines as described, for example, in WO 98/46608, WO 99/41255 or WO 03/004465 in each case by the general formula I, for example 5-chloro-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(4-methylpiperazin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(morpholin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(piperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(morpholin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(isopropylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(cyclopentylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(2,2,2-trifluoroethylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(1,1,1-trifluoropropan-2-ylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(3,3-dimethylbutan-2-ylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(cyclohexylmethyl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(cyclohexyl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(2-methylbutan-3-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(3-methylpropan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(4-methylcyclohexan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(hexan-3-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(2-methylbutan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-chloro-7-(3-methylbutan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(4-methylpiperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(4-methylpiperazin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(morpholin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(piperidin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(morpholin-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(isopropylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(cyclopentylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(2,2,2-trifluoroethylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(1,1,1-trifluoropropan-2-ylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(3,3-dimethylbutan-2-ylamino)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(cyclohexylmethyl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(cyclohexyl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(2-methylbutan-3-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(3-methylpropan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(4-methylcyclohexan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(hexan-3-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(2-methylbutan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine, 5-methyl-7-(3-methylbutan-1-yl)-6-(2,4,6-trifluorophenyl)-[1,2,4]triazolo[1,5-a]pyrimidine and 5-methyl-7-

(1-methylpropan-1-yl)-6-(2,4,6-trifluorophenyl)-[1, 2,4]triazolo[1,5-a]pyrimidine; amide fungicides, such as cyclofenamid, and also (Z)-N-[(cyclopropylmethoxy-imino)-2,3-difluoro-6-(difluoromethoxy-)benzyl]-2-phenylacetamide.

Insecticides include, for instance antibiotic insecticides, such as allosamidin, thuringiensin; especially macrocyclic lactone insecticides, such as spinosad; in particular avermectin insecticides, such as abamectin, doramectin, emamectin, eprinomectin, ivermectin, selamectin; and milbemycin insecticides, such as lepimectin, milbemectin, milbemycin oxime, moxidectin; arsenical insecticides, such as calcium arsenate, copper acetoarsenite, copper arsenate, lead arsenate, potassium arsenite, sodium arsenite; botanical insecticides, such as anabasine, azadirachtin, d-limonene, nicotine, pyrethrins, cinerins, cinerin I, cinerin II, jasmolin I, jasmolin II, pyrethrin I, pyrethrin II, quassia, rotenone, ryania, sabadilla; carbamate insecticides, such as bendiocarb, carbaryl; especially benzofuranyl methylcarbamate insecticides, such as benfuracarb, carbofuran, carbosulfan, decarbofuran, furathiocarb; dimethylcarbamate insecticides, such as dimetan, dimetilan, hyquincarb, pirimicarb; oxime carbamate insecticides, such as alanycarb, aldicarb, aldoxycarb, butocarboxim, butoxycarboxim, methomyl, nitrilacarb, oxamyl, tazimcarb, thiocarboxime, thiodicarb, thiofanox; and phenyl methylcarbamate insecticides, such as allyxycarb, aminocarb, bufencarb, butacarb, carbanolate, cloethocarb, dicresyl, dioxacarb, EMPC, ethiofencarb, fenethacarb, fenobucarb, isoprocarb, methiocarb, metolcarb, mexacarbate, promacyl, promecarb, propoxur, trimethacarb, XMC, xylylcarb; dinitrophenol insecticides, such as dinex, dinoprop, dinosam, DNOC; fluorine insecticides, such as barium hexafluorosilicate, cryolite, sodium fluoride, sodium hexafluorosilicate, sulfluramid; formamidine insecticides, such as amitraz, chlordimeform, formetanate, formparanate; fumigant insecticides, such as acrylonitrile, carbon disulfide, carbon tetrachloride, chloroform, chloropicrin, para-dichlorobenzene, 1,2-dichloropropane, ethyl formate, ethylene dibromide, ethylene dichloride, ethylene oxide, hydrogen cyanide, iodomethane, methyl bromide, methylchloroform, methylene chloride, naphthalene, phosphine, sulfuryl fluoride, tetrachloroethane; inorganic insecticides, such as borax, calcium polysulfide, copper oleate, mercurous chloride, potassium thiocyanate, sodium thiocyanate; insect growth regulators; especially chitin synthesis inhibitors, such as bistrifluoron, buprofezin, chlorfluazuron, cyromazine, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, noviflumuron, penfluron, teflubenzuron, triflumuron; juvenile hormone mimics, such as epofenonane, fenoxycarb, hydroprene, kinoprene, methoprene, pyriproxyfen, triprene; juvenile hormones, such as juvenile hormone I, juvenile hormone II, juvenile hormone III; moulting hormone agonists, such as chromafenozide, halofenozide, methoxyfenozide, tebufenozide; moulting hormones, such as β -ecdysone, ecdysterone; moulting inhibitors, such as diofenolan; precocenes, such as precocene I, precocene II, precocene II; and unclassified insect growth regulators, such as dicyclanil; nereistoxin analogue insecticides, such as bensultap, cartap, thiocyclam, thiosultap; nicotinoid insecticides, such as flonicamid; especially nitroguanidine insecticides, such as clothianidin, dinotefuran, imidacloprid, thiamethoxam; nitromethylene insecticides, such as nitenpyram, nithiazine; and pyridylmethanamine insecticides, such as acetamiprid, imidacloprid, nitenpyram, thiacloprid; organochlorine insecticides, such as bromo-DDT, camphechlor, DDT, pp'-DDT, ethyl-DDD, HCH, gamma-HCH, lindane, methoxychlor, pentachlorophenol, TDE; especially cyclodiene insecticides, such as aldrin, bromocyclen,

chlorbicyclen, chlordane, chlordecone, dieldrin, dilor, endosulfan, endrin, HEOD, heptachlor, HHDN, isobenzan, isodrin, kelevan, mirex; organophosphorus insecticides; especially organophosphate insecticides, such as bromfeninfos, chlorfenvinfos, crotoxyfos, dichlorvos, dicrotophos, dimethylvinfos, fospirate, heptenophos, methocrotophos, mevinfos, monocrotophos, naled, naftalofos, phosphamidon, propafos, TEPP, tetrachlorvinfos; organothiophosphate insecticides, such as dioxabenzofos, fosmethilan, phenthoate; in particular aliphatic organothiophosphate insecticides, such as acethion, amiton, cadusafos, chlorethoxyfos, chlormepfos, demephion, demephion-O, demephion-S, demeton, demeton-O, demeton-S, demeton-methyl, demeton-O-methyl, demeton-S-methyl, demeton-S-methylsulphon, disulfoton, ethion, ethoprophos, IPSP, isothioate, malathion, methacrifos, oxydemeton-methyl, oxydeprofos, oxydisulfoton, phorate, sulfotep, terbufos, thiometon; more particularly aliphatic amide organothiophosphate insecticides, such as amidithion, cyanthoate, dimethoate, ethoate-methyl, formothion, mecarbam, omethoate, prothoate, sophamide, vamidothion; and oxime organothiophosphate insecticides, such as chlorphoxim, phoxim, phoxim-methyl; heterocyclic organothiophosphate insecticides, such as azamethifos, coumaphos, coumithoate, dioxathion, endothion, menazon, morphothion, phosalone, pyraclofos, pyridaphenthion, quinothion; more particularly benzothiopyran organothiophosphate insecticides, such as dithicrofos, thicrofos; benzotriazine organothiophosphate insecticides, such as azinphos-ethyl, azinphos-methyl; isoindole organothiophosphate insecticides, such as dialifos, phosmet; isoxazole organothiophosphate insecticides, such as isoxathion, zolapropfos; pyrazolopyrimidine organothiophosphate insecticides, such as chlorprazofos, pyrazofos; pyridine organothiophosphate insecticides, such as chlorpyrifos, chlorpyrifos-methyl; pyrimidine organothiophosphate insecticides, such as butathiofos, diazinon, etrimfos, lirimfos, pirimiphos-ethyl, pirimiphos-methyl, primidophos, pyrimitate, tebupirimfos; quinoxaline organothiophosphate insecticides, such as quinalfos, quinalfos-methyl; thiadiazole organothiophosphate insecticides, such as athidathion, lythidathion, methidathion, prothidathion; and triazole organothiophosphate insecticides, such as isazofos, triazofos; and phenyl organothiophosphate insecticides, such as azothoate, bromophos, bromophos-ethyl, carbophenothion, chlorthiophos, cyanophos, cythioate, dicaphton, dichlofenthion, etaphos, famphur, fenchlorfos, fenitrothion, fensulfothion, fenthion, fenthion-ethyl, heterophos, jodfenfos, mesulfenfos, parathion, parathion-methyl, phenkapton, phosnichlor, profenofos, prothiofos, sulprofos, temepfos, trichlormetaphos-3, trifenofos; phosphonate insecticides, such as butonate, trichlorfon; phosphonothioate insecticides, such as mecarphon; in particular phenyl ethylphosphonothioate insecticides, such as fonofos, trichloronat; and phenyl phenylphosphonothioate insecticides, such as cyanofenfos, EPN, leptofos; phosphoramidate insecticides, such as crufomate, fenamifos, fosthietan, mepfosfolan, fosfolan, pirimetaphos; phosphoramidothioate insecticides, such as acephate, isocarbophos, isofenfos, methamidophos, propetamphos; and phosphorodiamide insecticides, such as dimefox, mazidox, mipafox, schradan; oxadiazine insecticides, such as indoxacarb; phthalimide insecticides, such as dialifos, phosmet, tetramethrin; pyrazole insecticides, such as acetoprole, ethiprole, fipronil, pyrafluprole, pyriprole, tebufenpyrad, tolfenpyrad, vaniliprole; pyrethroid insecticides; especially pyrethroid ester insecticides, such as acrinathrin, allethrin, bioallethrin, barthrin, bifenthrin, bioethanomethrin, cyclothrin, cycloprothrin, cyfluthrin, beta-cyfluthrin, cyhalothrin, gamma-cyhalothrin, lambda-cyhalothrin, cypermethrin, alpha-cypermethrin, beta-cypermethrin, theta-cypermethrin, zeta-

cypermethrin, cyphenothrin, deltamethrin, dimefluthrin, dimethrin, empenethrin, fenfluthrin, fenpirithrin, fenpropathrin, fenvalerate, esfenvalerate, flucythrinate, fluvalinate, tau-fluvalinate, furethrin, imiprothrin, metofluthrin, permethrin, biopermethrin, transpermethrin, phenothrin, prallethrin, profluthrin, pyresmethrin, resmethrin, bioresmethrin, cismethrin, tefluthrin, terallethrin, tetramethrin, tralomethrin, transfluthrin; and pyrethroid ether insecticides, such as etofenprox, flufenprox, halfenprox, protrifenbute, silafluofen; pyrimidinamine insecticides, such as flufenerim, pyrimidifen; pyrrole insecticides, such as chlorfenapyr; tetrionic acid insecticides, such as spiromesifen; thiourea insecticides, such as diafenthiuron; urea insecticides, such as flucofuron, sulcofuron; unclassified insecticides, such as closantel, crotamiton, EXD, fenazaflor, fenoxacrim, flubendiamide, hydramethylnon, isoprothiolane, malonoben, metaflumizone, metoxadiazone, nifluridide, pyridaben, pyridalyl, rafoxanide, triarathene, triazamate.

insecticides include: organophosphates, such as azinphos-methyl, azinphos-ethyl, chlorpyrifos, chlorpyrifos-methyl, chlorfenvinphos, diazinon, dimethylvinphos, dioxabenzofos, disulfoton, ethion, EPN, fenitrothion, fenthion, heptenophos, isoxathion, malathion, methidathion, methyl-parathion, paraoxon, parathion, phenthoate, phosalone, phosmet, phorate, phoxim, pirimiphos-methyl, profenofos, prothiofos, primiphos-ethyl, pyraclofos, pyridaphenthion, sulprofos, triazophos, trichlorfon, tetrachlorvinphos, vamidothion; carbamates, such as alanycarb, benfuracarb, bendiocarb, carbaryl, carbofuran, carbosulfan, fenoxycarb, furathiocarb, indoxacarb, methiocarb, pirimicarb, propoxur, thiodicarb, triazamate; pyrethroids, such as bifenthrin, cyfluthrin, cycloprothrin, cypermethrin, deltamethrin, esfenvalerate, ethofenprox, fenpropathrin, fenvalerate, cyhalothrin, lambda-cyhalothrin, permethrin, silafluofen, tau-fluvalinate, tefluthrin, tralomethrin, alpha-cypermethrin, permethrin; arthropod growth regulators: a) chitin synthesis inhibitors, for example benzoylureas, such as chlorfluazuron, diflubenzuron, flucycloxuron, flufenoxuron, hexaflumuron, lufenuron, novaluron, teflubenzuron, triflumuron; buprofezin, diofenolan, hexythiazox, etoxazole, clofentazine; b) ecdysone antagonists, such as halofenozide, methoxyfenozide, tebufenozide; c) juvenoids, such as pyriproxyfen, methoprene; d) lipid biosynthesis inhibitors, such as spiroadiclofen; neonicotinoids, such as flonicamid, clothianidin, dinotefuran, imidacloprid, thiamethoxam, nithiazine, acetamiprid, thiacloprid; further insecticides which do not belong to the above classes, such as abamectin, acequinocyl, acetamiprid, amitraz, azadirachtin, bensultap, bifenazate, cartap, chlorfenapyr, chlordimeform, diafenthiuron, dinotefuran, diofenolan, emamectin, endosulfan, ethiprole, fenazaquin, fipronil, formetanate, formetanate hydrochloride, gamma-HCH, hydramethylnon, imidacloprid, indoxacarb, isoprocarb, metolcarb, pyridaben, pymetrozine, spinosad, tebufenpyrad, thiamethoxam, XMC and xylylcarb and N-phenylsemicarbazones as described in EP-A 462 456 by the formula I, in particular compounds of the general formula IV

in which R11 and R12 independently of one another are hydrogen, halogen, CN, C1-C4-alkyl, C1-C4-alkoxy, C1-C4-haloalkyl or C1-C4-haloalkoxy and R13 is C1-C4-alkoxy, C1-C4-haloalkyl or C1-C4-haloalkoxy, for example compounds IV in which R11 is 3-CF₃ and R12 is 4-CN and R13 is 4-OCF₃;

pesticide can be a neutral or ionic (anionic or cationic) compound, an acidic or basic compound, optionally in the form an acid or base addition salt, a polar or a polar compound.

Particular pesticides are selected from the group consisting of phenoxyacetic herbicides and plant growth regulators such as (2,4-dichlorophenoxy)acetic acid;

nitrophenyl ether herbicides such as 5-(2-chloro-?,?,?-trifluoro-p-tolyloxy)-2-nitrobenzoic acid; pyrethroid ester acaricides and insecticides such as the racemate comprising (R)-?-cyano-3-phenoxybenzyl (1S,3S)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (S)-?-cyano-3-phenoxybenzyl (1R,3R)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate, the racemate comprising (R)-?-cyano-3-phenoxybenzyl (1S)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate and (S)-?-cyano-3-phenoxybenzyl (1R)-cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate; further herbicides such as 3-isopropyl-1H-2,1,3-benzothiadiazin-4(3H)-one 2,2-dioxide; anilide fungicides and pyridine fungicides such as 2-chloro-N-(4'-chlorobiphenyl-2-yl)nicotinamide; benzimidazole fungicides and benzimidazolylcarbamate fungicides such as methyl benzimidazol-2-ylcarbamate; pyrrole acaricides and insecticides such as 4-bromo-2-(4-chlorophenyl)-1-ethoxymethyl-5-(trifluoromethyl)pyrrole-3-carbonitrile; organophosphate acaricides and insecticides such as (EZ)-2-chloro-1-(2,4-dichlorophenyl)vinyl diethyl phosphate; pyridazinone herbicides such as 5-amino-4-chloro-2-phenylpyridazin-3(2H)-one; plant growth regulators such as 2-chloroethyl trimethylammonium; dicarboximide herbicides such as ethyl (Z)-2-chloro-3-[2-chloro-5-(cyclohex-1-ene-1,2-dicarboximido)phenyl-]acrylate; herbicides such as (1RS,2SR, 4SR)-1,4-epoxy-p-menth-2-yl 2-methylbenzyl ether; bird repellents and copper fungicides such as dicopper chloride trihydroxide; chlorotriazine herbicides such as 2-(4-chloro-6-ethylamino-1,3,5-triazin-2-ylamino)-2-methylpropionitrile; pyrimidinylsulfonyleurea herbicides such as 1-[2-(cyclopropylcarbonyl)anilinosulfonyl]-3-(4,6-dimethoxypyrimidin-2-yl-)urea; cyclohexene oxime herbicides such as (RS)-(EZ)-2-[1-(ethoxyimino)butyl]-3-hydroxy-5-thian-3-ylcyclohex-2-en-1- one; cyclic dithiocarbamate fungicides, dithiocarbamate herbicides and nematicides such as 3,5-dimethyl-1,3,5-thiadiazinane-2-thione, tetrahydro-3,5-dimethyl-1,3,5-thiadiazine-2-thione; benzoic acid herbicides and plant growth regulators such as 3,6-dichloro-o-anisic acid; phenoxypropionic herbicides and plant growth regulators such as (RS)-2-(2,4-dichlorophenoxy)propionic acid; quaternary ammonium herbicides such as 1,2-dimethyl-3,5-diphenylpyrazolium; urea herbicides such as 2-{1-[4-(3,5-difluorophenyl)semicarbazono]ethyl}nicotinic acid; amide

herbicides such as (S)-2-chloro-N-(2,4-dimethyl-3-thienyl)-N-(2-methoxy-1-methylethyl)acetamide; organothiophosphate acaricides, aliphatic amide organothiophosphate insecticides and nematicides such as O,O-dimethyl S-methylcarbamoylmethyl phosphoro dithioate, 2-dimethoxyphosphinothioylthio-N-methylacetamide; morpholine fungicides such as (EZ)-4-[3-(4-chlorophenyl)-3-(3,4-dimethoxyphenyl)acryloyl]morpholine; strobilurin fungicides such as (E)-2-(methoxyimino)-N-methyl-2-[-(2,5-xilyloxy)-o-tolyl]acetamide; quinone fungicides such as 5,10-dihydro-5,10-dioxonaphtho[2,3-b]-1,4-dithi-in-2,3-dicarbonitrile; morpholine fungicides such as 4-cyclododecyl-2,6-dimethylmorpholine; conazole fungicides such as (2RS,3SR)-1-[3-(2-chlorophenyl)-2,3-epoxy-2-(4-fluorophenyl)propyl]-1H-1,2,4-triazole; pyrazole insecticides such as 5-amino-1-(2,6-dichloro-?,?,?-trifluoro-p-tolyl)-4-ethy-

lsulfinylpyrazole-3-carbonitrile; organotin acaricides such as bis[tris(2-methyl-2-phenylpropyl)tin]oxide; amide fungicides such as a mixture of 85% (R)-N-[(RS)-1-cyano-1,2-dimethylpropyl]-2-(2,4-dichlorophenoxy)propionamide and 15% (S)-N-[(RS)-1-cyano-1,2-dimethylpropyl]-2-(2,4-dichlorophenoxy)propionamide; morpholine fungicides such as (RS)-cis-4-[3-(4-tert-butylphenyl)-2-methylpropyl]-2,6-dimethylmorpholine; pyrazole acaricides and insecticides such as 5-amino-1-(2,6-dichloro-?,?,?-trifluoro-p-tolyl)-4-trifluoromethylsulfinylpyrazole-3-carbonitrile; arylalanine herbicides such as N-benzoyl-N-(3-chloro-4-fluorophenyl)-D-alanine; coumarin rodenticides such as 4-hydroxy-3-[1,2,3,4-tetrahydro-3-[4-(4-trifluoromethylbenzyloxy)-phenyl]-1-naphthyl]coumarin (e.g. mixture of cis- to trans-isomers in the ratio range 60:40 to 40:60); pyrethroid ester acaricides and insecticides such as (RS)-?-cyano-3-phenoxybenzyl(S)-2-(4-difluoromethoxyphenyl)-3-methylbutyrate; mite growth regulators and insecticides such as 1-[4-(2-chloro-?,?,?-trifluoro-p-tolyloxy)-2-fluorophenyl]-3-(2,6-difluorobenzoyl)urea; nitrophenyl ether herbicides such as O-[5-(2-chloro-?,?,?-trifluoro-p-tolyloxy)-2-nitrobenzoyl]glycolic acid; organophosphorus herbicides such as N-(phosphonomethyl)glycine; insecticides moulting hormone agonists such as N-tert-butyl-N'-(4-chlorobenzoyl)benzohydrazide; mite growth regulators and acaricides such as (4RS,5RS)-5-(4-chlorophenyl)-N-cyclohexyl-4-methyl-2-oxo-1,3-thiazolidine-3-carboxamide; insecticides such as 5,5-dimethylperhydropyrimidin-2-one 4-trifluoromethyl-?(4-trifluoromethylstyryl)-cinnamylidenehydrazonone; imidazolinone herbicides such as a reaction mixture of (RS)-6-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-m-toluic acid and (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-p-toluic acid; imidazolinone herbicides such as (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methoxymethylnicotinic acid, (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methylnicotinic acid, (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid, (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)quinoline-3-carboxylic acid, (RS)-5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid; dichlorophenyl dicarboximide fungicides and imidazole fungicides such as 3-(3,5-dichlorophenyl)-N-isopropyl-2,4-dioxoimidazolidine-1-carboxamide; strobilurin fungicides such as methyl(E)-methoxyimino[?(o-tolyloxy)-o-tolyl]acetate; growth inhibitors such as 1,1-dimethylpiperidinium; insecticides such as (EZ)-2'-[2-(4-cyanophenyl)-1-(?,?,?-trifluoro-m-tolyl)ethylidene]-4-(trifluoromethoxy)carbanilohydrazide; dithiocarbamate fungicides, herbicides and nematocides such as methyl dithiocarbamic acid; chloroacetanilide herbicides; conazole fungicides such as (1RS,5RS; 1RS,5SR)-5-(4-chlorobenzyl)-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol; zinc ammoniate ethylenebis(dithiocarbamate)-poly(ethylenethiuramdisulfide); phenylurea herbicides such as 3-(4-bromophenyl)-1-methoxy-1-methylurea; phenylurea herbicides and plant growth regulators such as 3-(3-chloro-4-methoxyphenyl)-1,1-dimethylurea; fungicides such as 3'-bromo-2,3,4,6'-tetramethoxy-2',6'-dimethylbenzophenone; fungicides such as di-isopropyl 5-nitroisophthalate; strobilurin fungicides such as (2E)-2-(methoxyimino)-2-{2-[(3E,5E,6E)-5-(methoxyimino)-4,6-dimethyl-2,8-dioxo-3,7-diazanona-3,6-dien-1-yl]phenyl}-N-methylacetamide; dinitroaniline herbicides such as N-(1-ethylpropyl)-2,6-dinitro-3,4-xylidine; organothiophosphate acaricides, aliphatic amide organothiophosphate insecticides and nematocides such as O,O-diethyl S-ethylthiomethyl phosphorodithioate; anilide herbicides and pyridine herbicides such as 4'-fluoro-6-(?,?,?-trifluoro-m-tolyloxy)pyridine-2-carboxanilide; amide fungicides and conazole fungicides such as N-propyl-N-[2-(2,4,6-trichloro

phenoxy)ethyl]imidazole-1-carboxamide, 1-{N-propyl-N-[2-(2,4,6-trichlorophenoxy)ethyl]}carbamoylimidazole; cyclohexene oxime herbicides such as 2-{(EZ)-1-[(2RS)-2-(4-chlorophenoxy)propoxyimino]butyl}-3-hydroxy-5-(thia-n-3-yl)cyclohex-2-en-1-one; plant growth regulators such as 3,5-dioxo-4-propionylcyclohexanecarboxylic acid; strobilurin fungicides such as methyl N-{2-[1-(4-chlorophenyl)-1H-pyrazol-3-yloxymethyl]phenyl}(N-methoxy)carbamate; acaricides and insecticides such as 2-tert-butyl-5-(4-tert-butylbenzylthio)-4-chloropyridazin-3(2H)-one; pyrimidine fungicides such as N-(4,6-dimethylpyrimidin-2-yl)aniline; quinolinecarboxylic acid herbicides such as 3,7-dichloroquinoline-8-carboxylic acid, 7-chloro-3-methylquinoline-8-carboxylic acid; cyclohexene oxime herbicides such as (RS)-(EZ)-2-(1-ethoxyiminobutyl)-5-[2-(ethylthio)propyl]-3-hydroxycyclohex-2-en-1-one, pyrazole acaricides and insecticides such as N-(4-tert-butylbenzyl)-4-chloro-3-ethyl-1-methylpyrazole-5-carboxamide; insecticides and chitin synthesis inhibitors such as 1-(3,5-dichloro-2,4-difluorophenyl)-3-(2,6-difluorobenzoyl)urea; phenyl organothiophosphate insecticides such as O,O,O',O'-tetramethyl O,O'-thiodi-p-phenylene bis(phosphorothioate), O,O,O',O'-tetramethyl O,O'-thiodi-p-phenylene diphosphorothioate; cyclohexene oxime herbicides such as (RS)-(EZ)-2-{1-[(2E)-3-chloroallyloxyimino]propyl}-3-hydroxy-5-pyrhydropyran-4-ylcyclohex-2-en-1-one; aliphatic organothiophosphate insecticides and nematicides such as S-tert-butylthiomethyl O,O-diethyl phosphoro dithioate; benzimidazole precursor fungicides and carbamate fungicides such as dimethyl 4,4'-(o-phenylene)bis(3-thioallophanate); phenyl pyrazolyl ketone herbicides such as [3-(4,5-dihydro-1,2-oxazol-3-yl)-4-mesyl-o-tolyl](5-hydroxy-1-methyl-1H-pyrazol-4-yl)methanone; insecticides such as ethyl (3-tert-butyl-1-dimethylcarbamoyl-1H-1,2,4-triazol-5-ylthio)acetate; morpholine fungicides such as a reaction mixture of 4-alkyl-2,6-dimethylmorpholines, where "alkyl" is mixture of C11-C14 homologues of which 60-70% is tridecyl; amide fungicides such as N,N'-(piperazine-1,4-diyl)bis[(trichloromethyl)methylene]di-formamide, 1,1'-piperazine-1,4-diyl-di-[N-(2,2,2-trichloroethyl)formamide]; conazole fungicides such as (RS)-(E)-5-(4-chlorobenzylidene)-2,2-dimethyl-1-(1H-1,2,4-triazol-1-ylmethyl)cyclopentanol; triazinylsulfonylurea herbicides such as 1-[4-methoxy-6-(trifluoromethyl)-1,3,5-triazin-2-yl]-3-[2-trifluoromethyl]benzenesulfonylurea; dichlorophenyl dicarboximide fungicides; oxazole fungicides such as (RS)-3-(3,5-dichlorophenyl)-5-methyl-5-vinyl-1,3-oxazolidine-2,4-dione.

Pesticides can undergo environmental transformation. This includes biological transformation such as metabolization (aerobic or anaerobic) and chemical (including photochemical) transformation, e.g. chemical reactions such as hydrolysis, oxidation and isomerization. Transformation means conversion to other organic compounds. Thus, transformation products of pesticides include in particular metabolization products (metabolites) as well as reaction products of the pesticide, metabolites and reaction products.

Physicochemical properties such as solubility, partition coefficient and stability data, as well as information regarding the environmental fate (half-life, DT50, metabolites) can be taken from standard handbooks such The Pesticide Manual, British Crop Protection Council, e.g. the 12th edition 2000.

Priscilla Judd