

Commercially used invertebrate biocontrol agents in the EPPO region - ref. Epso standard PM 6/3 - Appendix I

Red text = organism registered in Norway (<http://mattilsynet.no/planter/plantevernmidler/preparatlister>)

Green text = organism recorded naturally in Norway (<http://artskart.artsdatabanken.no/FaneArtSok.aspx>)

\* = Not re-registered in Norway \*\* = Application rejected in Norway (in 2001)

Updated August 2021

New organisms listed in 2017-2019 = 4 stk

New organisms listed in 2020-2021 = 4 stk

Scientific name	English/ Norwegian Name	Taxonomy	Target pests (ENG)	Target pests (NO)	Origin	Distribution	Introduced	Used in EPPO countries	Use	Optimal climate	Manufacturers	Norwegian importer	Norwegian evaluation
<i>Adalia bipunctata</i> **	Two spot ladybird/ To-prikket marihøne	Coccinellidae	Aphididae	Bladlus	Palaeartic?	Widespread	1998	Belgium, Denmark, Germany, Italy, Netherlands, Portugal, Slovenia, Switzerland	Indoors	19-27 °C	KOPPERT B.V. Biobest NV Borregaard	-	Recorded naturally in Norway. Agronomic efficacy not sufficiently documented + risk of genetic mixing (and infection of micro-organisms)
<i>Aleochara bilineata</i>	Egg-eating rove beetle	Staphylinidae	<i>Delia antiqua</i> , <i>Delia radicum</i> (= <i>Delia brassicae</i> )	Løklue og kållue	Northern and Middle Europe, Canada and USA	Widespread	1997 (in Netherlands)	Netherlands, some other European countries	Outdoors	20°C, 60 % RF, >16 hours day (LD)		-	Recorded naturally in Norway
<i>Atheta coriaria</i>	Greenhouse Rove Beetle	Staphylinidae (rove beetles)	Thripidae, Sciaridae, Ephyrididae (shore flies)	Trips, hærmygg, vannfluer	Europe, Northern Asia, North America, Oceania	Widespread in EPPO region	2002 (Biobest)	Belgium, France, Germany, Netherlands, Poland, Spain, Switzerland, United Kingdom	Indoors	> 8°C >85% RH?	Biobest NV Bioline AgroSciences	-	Recorded naturally in Norway. Applied for approval in Norway in 2019. Efficacy evaluation was conducted November 2019.
<i>Chilocorus baileyi</i>	Scale predator beetle	Coccinellidae	Diaspididae	Panserskjoldlus	Australia	Not established	1985	Belgium, France, Netherlands	Indoors			-	
<i>Chilocorus bipustulatus</i>	Heather ladybird	Coccinellidae	Diaspididae, Coccidae ( <i>Saissetia oleae</i> )	Panserskjoldlus, skallskjoldlus	South Palaeartic	Widespread (South and Central)	1959	Belgium, France, Greece, Israel, Italy, Netherlands, Turkey	Outdoors/ indoors	>12 °C		-	Recorded naturally in Norway
<i>Chilocorus circumdatus</i>	Scale predator beetle	Coccinellidae	Diaspididae	Panserskjoldlus	S. E. Asia	Not established	1985	Belgium, France, Netherlands	Indoors			-	
<i>Chilocorus nigrita</i>	-	Coccinellidae	Diaspididae, Asterolecaniidae	Panserskjoldlus, o.a. skjoldlus	South Asia	Not established	1985	Belgium, Denmark, France, Germany, Netherlands, UK	Indoors	>12 °C		-	
<i>Coccinella septempunctata</i>	Seven spot ladybird/ sjuprikket marihøne	Coccinellidae	Aphididae	Bladlus	Palaeartic	Widespread	1980	France, Germany, Portugal, Slovenia	Outdoors	>11 °C		-	Recorded naturally in Norway
<i>Cryptolaemus montrouzieri</i>	Australian ladybird beetle	Coccinellidae	<i>Planococcus citri</i>	"Sitrus ull-lus"	Australia	Mediterranean area	1985	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, Switzerland, Tunisia, UK	Outdoors/ indoors	>16 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS	Used before 2000. Registered 2001 and 2007
<i>Delphastus catalinae</i>	Whitefly ladybeetle	Coccinellidae	Aleyrodidae ( <i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i> )	Mellus	Nearctic/ Neotropic	Widespread in C/S- Europe, America, E-Asia	1993	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Jordan, Netherlands, Poland, Russia, Spain, Tunisia, UK (restricted under license)	Indoors	> 20°C	KOPPERT B.V. Biobest NV Borregaard	-	
<i>Propylea quatuordecimpunctata</i>	Fourteen-spotted ladybeetle/ Sjakkbrettmarihøne	Coccinellidae	Aphids belonging to the superfamily of Aphidoidea	Bladlus	Palaearctic region	Widespread	2018	Belgium, Italy, Luxembourg, the Netherlands, Spain, UK and Benelux	Indoors/ outdoors	>14 °C		-	
<i>Rhizobius lophanthae</i>	Lady beetle scale destroyer	Coccinellidae	Diaspididae ( <i>Pseudolacaspis pentagona</i> ), <i>Quadraspidiatus perniciosus</i> , <i>Chrysomphalus</i>	Panserskjoldlus	Australia	Mediterranean, Russia	1980	Belgium, Denmark, Germany, Greece, Israel, Italy, Netherlands, Portugal, Switzerland, Turkey	Indoors			-	
<i>Rodolia cardinalis</i>	Vedalia beetle	Coccinellidae	<i>Icerya purchasi</i>	Sitruskjoldlus	Australia	Mediterranean area, CIS	1980?	Belgium, Netherlands	Outdoors/ indoors			-	

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<i>Scymnus rubromaculatus</i>	-	Coccinellidae	Aphididae	Bladlus	Central-Europa	Finland, Estonia, Lithuania	1990	Belgium, France, Netherlands, Portugal	Indoors			-	
<i>Stethorus punctillum</i>	Spider mite destroyer	Coccinellidae	<i>Panonychus ulmi</i>	Fruktremidd	Palaeartic	Widespread	1995	Belgium, France, Germany, Netherlands, Portugal, Spain, Sweden.	Indoors			-	Recorded naturally in Norway
<i>Aphidoletes aphidimyza</i>	Aphid predator/ Aphid gall-midge/ Bladlusgallmygg	Cecidomyiidae	Aphididae ( <i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>Macrosiphum</i> , <i>Aulacorthum</i> )	Bladlus	Central Europe, Palaeartic	Widespread	1985	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Spain, Slovakia, Slovenia, Sweden, Switzerland, Tunisia, UK	Outdoors/ Indoors	18-28 °C > 16 °C at night RF > 60%	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS Bombus Natur AS	Used before 2000. Registered 2001 and 2007
<i>Episyrrhus balteatus</i>	dobbeltbåndet blomsterflue	Syrphidae	Aphididae	Bladlus	Europa	Widespread	1995	Belgium, Denmark, Germany, Italy, Netherlands, Portugal, Slovenia	Outdoors/ indoors		KOPPERT B.V. BioProduction ApS	-	Recorded naturally in Norway
<i>Eupeodes corollae</i>	Vanlig markblomsterflue	Syrphidae	Aphididae	Bladlus	Palaeartic and southern Afrotropical regions	Widespread	2020	Belgium, Latvia, the Netherlands, Spain, UK	Indoors/ outdoors	15 to 25 °C	Biobest NV	-	Recorded naturally in Norway
<i>Feltiella acarisuga</i>	Red spider mite gall midge predator/ Middgallmygg	Cecidomyiidae	<i>Tetranychus urticae</i> , <i>T. cinnabarinus</i>	Spinnmidd	W. Europe/ Mediterranean	Widespread	1995	Belgium, Czechia, Denmark, Finland, France, Germany, Guernsey, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Spain, (Sweden), Switzerland, UK	Indoors	> 15 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS	Occur naturally, but not recorded. Used before 2000. Registered 2001 and 2007
<i>Sphaerophoria rueppellii</i>	Steppekulehaleflue	Syrphidae	Aphididae but also whiteflies, thrips and spider mites	Bladlus, trips, mellus og spinnmidd	Palaeartic and Afrotropical regions	Mediterranean region	2012	Spain	Indoors/ outdoors	25 - 35°C Larvae need moist microclimate	Biobest NV	-	Recorded naturally in Norway
<i>Anthocoris nemoralis</i>	Flower bug	Anthocoridae	Psyllidae (orchards)	Plantesugere	Palaeartic	Widespread	?	Belgium, Denmark, Germany, Israel, Netherlands, Slovenia	Outdoors	> 10 °C	BioProduction ApS Bioline AgroSciences Borregaard	-	Recorded naturally in Norway
<i>Anthocoris nemorum</i>	Common flowerbug/ Vanlig nebbtge	Anthocoridae	<i>Cacopsylla pyri</i> , thrips	Pæresuger, trips	Palaeartic	Widespread	1992	Belgium, Denmark, France, Italy, Jersey, Netherlands, Slovenia, UK	Outdoors	> 10 °C		-	Recorded naturally in Norway
<i>Macrolophus pygmeus</i> ( <i>syn. M. caliginosus</i> )	Capsid bug/ Bladtege	Miridae	Aleyrodidae	Veksthusmellus og bomullsmellus. Den kan også bekjempe sommerfuglegg, bladlus, spinnmidd, trips og minèrfluelarver	Palaeartic	Widespread	1990	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jordan, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK (restricted under license)	Indoors (Not cherry tomato and Gerbera)	> 15 °C (10- 27 °C )	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS Bombus Natur AS	Used before 2000. Registered 2001 and 2007
<i>Orius albidipennis</i>	Minute pirate bug/ rovtege	Anthocoridae	Thrips	Trips	Mediterranean, palaeartic	Mediterranean	1991	Belgium, France, Israel, Italy, Netherlands, Spain	Indoors			-	
<i>Orius laevigatus</i> *	Minute pirate bug/ rovtege	Anthocoridae	Thripidae ( <i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i> )	Trips (amerikansk blomstertrips, nelliktrips)	Palaeartic (except north)	Widespread (except north)	1991	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Israel, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Poland, Portugal, Slovakia, Spain, Switzerland, Tunisia, UK	Indoors	15-30 °C	KOPPERT B.V. BioProduction ApS Bioline AgroSciences Borregaard	-	Used before 2000. Risk of establishment.

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<i>Orius majusculus</i>	Minute pirate bug/ rovtege	Anthoridae	Thripidae ( <i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i> )	Trips (amerikansk blomsterrips, nellikrips)	Palearctic	Widespread	1991	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Israel, Italy, Jersey, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, (Sweden), Switzerland, UK	Indoors	>16 hours day (LD) 16-25 °C 50-80% RF	BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRØ AS VEKSTMILJØ AS	Recorded. Used before 2000. Registered 2001 and 2007
<i>Picromerus bidens</i>	Spiked Shieldbug/ Breitege	Pentatomidae	Lepidoptera	Sommerfugler	Palearctic (also established in Nearctic)	Widespread	1990	CIS countries (Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, and Uzbekistan), Germany, Poland, Russia, Slovenia,	Outdoors/ Indoors			-	Recorded naturally in Norway
<i>Podisus maculiventris</i> **	Spined soldier bug	Pentatomidae	Lepidoptera, <i>Leptinotarsa decemlineata</i>	Sommerfugler og Coloradobille	North and South America	Not established	1996	Belgium, Bulgaria, Denmark, Finland, France, Greece, Italy, Netherlands, Russia, Spain	Outdoors/ Indoors		Biobest NV	-	Risk of genetic mixing and establishment in Norway + the agronomic efficacy is not sufficiently documented
<i>Acerophagus maculipennis</i> (syn. <i>Pseudaphycus maculipennis</i> )	-	Encyrtidae	Pseudococcidae ( <i>Pseudococcus affinis</i> = <i>P. viburni</i> )	Ull-lus (Veksthus-ullskjoldlus)	Palearctic	Widespread (south)	1980	Belgium, France, Germany, Netherlands, Spain	Indoors		ENTOCARE (KOPPERT?)	-	
<i>Anagrus atomus</i>	Leafhopper predator	Mymaridae	Cicadellidae	Sikader	Palearctic	?	1994	Belgium, France, Germany, Guernsey, Jersey, Netherlands, Spain, UK	Indoors			-	
<i>Anagrus fusciventris</i>	Long-tailed mealybug parasitoid	Encyrtidae	Pseudococcidae	Ull-lus	Australia	Not present	1990	Belgium, Denmark, France, Germany, Netherlands, Spain	Indoors			-	
<i>Anagrus vladimiri</i> (Syn. <i>A. pseudococci</i> )	Citrus mealybug parasitoid	Encyrtidae	Pseudococcidae	Ull-lus	Mediterranean	Not present	1995	France, Czechia, Greece, Italy, Netherlands, Portugal, Spain	Indoors/ outdoors		KOPPERT B.V.	-	
<i>Anastatus bifasciatus</i>	Stink bug parasitoid	Eupelmidae	Heteroptera ( <i>Halyomorpha halys</i> )	Breiteger (brunmarmorert breitege)	Europe	Widespread (See CABI distribution map)	2019	Italy	Outdoors	15 to 32 °C		-	-
<i>Aphelinus abdominalis</i> *	Aphid parasitic wasp	Aphelinidae	Aphididae ( <i>Macrosiphum euphorbiae</i> , <i>Aulacorthum solani</i> )	Bladlus (potetbladlus, grønnflekke veksthusbladlus)	Europe	Widespread	1992	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Jordan, Netherlands, Poland, Spain, (Sweden), Switzerland, Tunisia, UK	Indoors	20-30 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences	-	Recorded. Used before 2000. Risk of genetic mixing and establishment in Norway
<i>Aphidius colemani</i>	Aphid parasitic wasp	Braconidae	Aphididae ( <i>Aphis gossypii</i> , <i>Myzus persicae</i> , <i>M. nicotianae</i> )	Bladlus (agurkbladlus, ferskenbladlus)	North Africa, Middle East, India	Mediterranean area	1992	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK	Indoors	>13 °C < 30 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRØ AS VEKSTMILJØ AS Bombus Natur AS	Recorded, and used before 2000 and registered 2001 and 2007
<i>Aphidius ervi</i>	Aphid parasitic wasp	Braconidae	Aphididae ( <i>Aulacorthum solani</i> , <i>Macrosiphum euphorbiae</i> )	Bladlus (potetbladlus, grønnflekke veksthusbladlus)	Palearctic	Widespread	1995	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK	Indoors/ outdoors	>10 °C < 30 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRØ AS VEKSTMILJØ AS Bombus Natur AS	Recorded, used before 2000 and registered 2001 and 2007
<i>Aphidius matricariae</i>	Aphid parasitic wasp	Braconidae	<i>Myzus persicae</i>	Ferskenbladlus	Holarctic	Widespread in temperate regions	1990	Austria, Belgium, Germany, Guernsey, Jersey, Netherlands, Poland, Portugal, Slovakia, Slovenia, UK	Indoors		KOPPERT B.V. Bioline AgroSciences Biobest NV Borregaard	-	Recorded and used before 2000

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<i>Aphytis diaspidis</i>		Aphelinidae	Diaspididae, <i>Quadraspidiotus perniciosus</i> , <i>Pseudaulacaspis pentagona</i>	Panserskjoldlus (San José skjoldlus, m.fl.)	California	Mediterranean	?	Netherlands	Indoors			-	
<i>Aphytis holoxanthus</i>	Red scale parasitoid	Aphelinidae	Diaspididae	Panserskjoldlus	Asia	Mediterranean	1996	Belgium, Czechia, France, Netherlands, Spain	Indoors			-	
<i>Aphytis lingnanensis</i>	Red scale parasitoid	Aphelinidae	<i>Aonidiella aurantii</i> , <i>Chrysomphalus dictyospermi</i>	Skjoldlus	Probably eastern Asia (widely established elsewhere)	Mediterranean	?	Greece, Italy, Spain	Indoors/ outdoors			-	
<i>Aphytis melinus</i>	Red scale parasitoid	Aphelinidae	<i>Aonidiella aurantii</i>	Skjoldlus	India/ Pakistan	Mediterranean	1985	Belgium, Czechia, Denmark, France, Greece, Italy, Portugal, Spain	Indoors/ outdoors			-	
<i>Aprostocetus hagenowii</i>	Cockroach wasp	Eulophidae	Blattidae ( <i>Periplaneta spp.</i> )	Kakerlakker	?	Romania	1993	Belgium, France, Germany, Netherlands, Spain	Indoors			-	
<i>Bracon hebetor</i>	grain moth parasitoid	Braconidae	Lepidoptera (on stored products)	Sommerfugllarver (på matvarer på lager)	India, New England	Mediterranean area (mostly Eastern)	1980	Many (including Germany, Portugal)	Indoors			-	
<i>Coccophagus lycimnia</i>	-	Aphelinidae	Coccidae	Skallskjoldlus	Cosmopolitan	Mediterranean	1988	Belgium, Denmark, France, Germany, Netherlands, Portugal, Spain, (Sweden)	Indoors			-	
<i>Coccophagus rusti</i>	-	Aphelinidae	Coccidae	Skallskjoldlus	Cosmopolitan	Mediterranean	1988	Belgium, France, Netherlands, Spain	Indoors			-	
<i>Coccophagus scutellaris</i>	-	Aphelinidae	Coccidae	Skallskjoldlus	Cosmopolitan	Widespread	1986	Belgium, France, Netherlands, Portugal, Spain	Indoors			-	
<i>Comperiella bifasciata</i>	-	Encyrtidae	Diaspididae ( <i>Chrysomphalus aonidum</i> , <i>Aonidiella aurantii</i> )	Panserskjoldlus	California/ South China	Mediterranean	1985	Belgium, Greece, Netherlands	Indoors/ outdoors			-	
<i>Cotesia marginiventris</i>	-	Braconidae	Lepidoptera (Noctuidae)	Sommerfugler (natlfly)	America	?	1993	Belgium, France, Netherlands, Spain	Indoors			-	
<i>Dacnusa sibirica</i>	Leaf miner parasitoid/ Minerflue-snylteveps	Braconidae	Agromyzidae ( <i>Liriomyza spp.</i> )	Minerfluer	Palaearctic, Europe	Widespread, temperate regions	1981	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Guernsey, Italy, Jersey, Jordan, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, UK	Indoors/ outdoors (celery, lettuce)	10- 25 °C	KOPPERT B.V. BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS	Used before 2000. Registered 2001 and 2007
<i>Diglyphus isaea</i>	Leaf miner parasitoid/ Minerflue-snylteveps	Eulophidae	Agromyzidae ( <i>Liriomyza spp.</i> )	Minerfluer	Palaearctic	Widespread	1984	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Hungary, Italy, Jordan, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK	Indoors/ outdoors	>18 °C + LD	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS	Used before 2000. Registered 2001 and 2007
<i>Encarsia citrina</i>	-	Aphelinidae	Diaspididae	Panserskjoldlus	Cosmopolitan	Mediterranean	1984	Belgium, France, Germany, Netherlands, Spain	Indoors			-	
<i>Encarsia formosa</i>	Glasshouse whitefly parasitoid/ Mellus-snylteveps	Aphelinidae	Aleyrodidae ( <i>Trialetrodes vaporariorum</i> , <i>Bemisia tabaci</i> )	Mellus	Southern nearctic	Widespread	1930	Austria, Belgium, Bulgaria, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK	Indoors	> 16- 17 °C	KOPPERT B.V. Biobest NV Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMILJØ AS Bombus Natur AS	Used before 2000. Registered 2001 and 2007
<i>Encyrtus aurantii</i>	-	Encyrtidae	Coccidae	Skallskjoldlus	Palaearctic	Widespread (south)	1980	Belgium, France, Germany, Netherlands, Spain	Indoors			-	
<i>Encyrtus infelix</i>	-	Encyrtidae	Coccidae	Skallskjoldlus	Afrotropical region	Israel	1992	Belgium, Denmark, France, Netherlands, Spain	Indoors			-	Used before 2000

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<i>Ephedrus cerasicola</i>	-	Braconidae	Aphididae ( <i>Aphis frangulae</i> , <i>A. gossypii</i> , <i>Aulacorthum circumflexum</i> , <i>Aulacorthum solani</i> , <i>Myzus cerasi</i> , <i>M. nicotinae</i> , <i>M. ornatus</i> , <i>M. persicae</i> , <i>Nasonovia ribisnigri</i> , m.fl)	Bladlus	Naturally throughout Europe	Widespread	1999	Belgium, Denmark, Finland, France, Germany, Netherlands, UK	Indoors		Finnes i Bladlusnylteveps-MIX preparater fra f.eks. KOPPERT og BioProduction	-	Recorded naturally in Norway
<i>Eretmocerus eremicus</i>	Whitefly parasitoid/ Mellus-snylteveps	Aphelinidae	<i>Bemisia tabaci</i>	Bomullsmellus	Southern nearctic	Mediterranean	1994	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Italy, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey	Indoors	> 19- 20 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS <sup>1)</sup> NORGRO AS VEKSTMILJØ AS Bombus Natur AS	Used before 2000. Registered 2001 and 2007
<i>Eretmocerus mundus</i>	Whitefly parasitoid/ Mellus-snylteveps	Aphelinidae	<i>Bemisia tabaci</i>	Bomullsmellus	South Europe	Mediterranean	1996	Denmark, Germany, Italy, Netherlands, Portugal, Spain	Indoors	> 14 °C	Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	-	
<i>Gyranoisidea litura</i>	-	Encyrtidae	<i>Pseudococcus longispinus</i>	"Langfrynset ull-lus"	Africa	France, Spain	1990	Belgium, France, Netherlands	Indoors			-	
<i>Leptomastidea abnormis</i>	-	Encyrtidae	Pseudococcidae	Ull-lus	Palaeartic	Widespread	1984	Austria, Belgium, Denmark, Germany, Guernsey, Israel, Italy, Jersey, Netherlands, Spain, Switzerland, Turkey, UK	Indoors			-	
<i>Leptomastix dactylopii</i> *	-	Encyrtidae	<i>Planococcus citri</i>	"Sitrus ull-lus"	Neothropic	Mediterranean	1992	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Spain, UK	Indoors/ outdoors		KOPPERT B.V. BioProduction ApS Borregaard	-	Used before 2000. Application not submitted
<i>Leptomastix epona</i>	-	Encyrtidae	Pseudococcidae ( <i>Pseudococcus viburni</i> )	Ull-lus (veksthus ull-lus)	Palaeartic	Widespread (south)	1992	Belgium, Denmark, France, Germany, Guernsey, Jersey, Netherlands, Spain, UK	Indoors			-	
<i>Metaphycus flavus</i>	-	Encyrtidae	Coccidae, ( <i>Saissetia oleae</i> , <i>Coccus hesperidum</i> )	Skallskjoldlus	Nearctic	Mediterranean	1999	Germany, Netherlands, Switzerland	Indoors			-	
<i>Metaphycus helvolus</i>	-	Encyrtidae	Coccidae ( <i>Saissetia oleae</i> , <i>Coccus hesperidum</i> )	Skallskjoldlus	South Africa (also established in Nearctic)	Greece, Italy	1992	Austria, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Netherlands, Spain, Switzerland	Indoors/ outdoors			-	
<i>Metaphycus lounsburyi</i>	-	Encyrtidae	Coccidae ( <i>Saissetia oleae</i> )	Skallskjoldlus	California, Australia, Hawaii, South Africa	Mediterranean	1997	Denmark, France, Italy, Netherlands	Indoors/ outdoors			-	
<i>Metaphycus swirskii</i>	-	Encyrtidae	Coccidae	Skallskjoldlus	East Africa?	France, Greece (Crete), Israel, Italy (probably Mediterranean region)	1992	Belgium, France, Netherlands, Spain	Indoors			-	
<i>Microterys nietneri</i>	-	Encyrtidae	Coccidae ( <i>Saissetia oleae</i> )	Skallskjoldlus	California, Pakistan	Italy	1987	Belgium, Denmark, France, Germany, Greece, Israel, Netherlands, Spain, former-Yugoslavia	Indoors/ outdoors			-	
<i>Opius pallipes</i>	-	Braconidae	<i>Liriomyza bryoniae</i>	"Tomatminerflue"	Palaeartic?	Widespread	1980	Belgium, Czechia, Denmark, France, Germany, Greece, Guernsey, Jersey, Lithuania, Netherlands, Poland, Spain, UK	Indoors			-	
<i>Praon volucre</i>	-	Braconidae	Aphididae	Bladlus	Palaeartic	Widespread	?	Belgium, Guernsey, Jersey, Netherlands, Slovenia, UK	Indoors			-	Recorded naturally in Norway
<i>Scutellista caerulea</i>	-	Pteromalidae	Coccidae ( <i>Saissetia oleae</i> , <i>S. coffeae</i> , <i>Ceroplastes rusci</i> )	Skallskjoldlus	Africa	Mediterranean	1990	Belgium, Denmark, France, Netherlands, Switzerland	Indoors			-	

MAKROorganismer mot SKADEDYR

Scientific name	English/ Norwegian Name	Taxonomy	Target pests (ENG)	Target pests (NO)	Origin	Distribution	Introduced	Used in EPPO countries	Use	Optimal climate	Manufacturers	Norwegian importer	Norwegian evaluation
<i>Tetracnemoidea peregrina</i>	-	Encyrtidae	Pseudococcidae	Ull-lus	North America	Israel	1992	Belgium, France, Israel, Netherlands, Spain	Indoors/ outdoors			-	
<i>Tetracnemoidea brevicornis</i>	-	Encyrtidae	Pseudococcidae	Ull-lus	?	Italy	1992	Belgium, France, Netherlands, Spain	Indoors			-	
<i>Thripobius javae</i>	Glasshouse thrips parasitoid	Eulophidae	Thysanoptera ( <i>Heliethrips</i> spp.)	Trips	Tropical and subtropical areas of Africa, Asia and Australia	Israel	1995	Belgium, Denmark, France, Germany, Netherlands	Indoors			-	
<i>Trichogramma brassicae</i> *	Lepidopteran egg parasitoid	Hymenoptera	Lepidoptera ( <i>Ostrinia nubilalis</i> )	Sommerfugler	Europe	Widespread	1980	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Italy, Jersey, Jordan, Netherlands, Slovakia, Spain, Switzerland, UK	Indoors/ outdoors	13-21 °C , 50- 80 % RF	BioProduction ApS Bioline AgroSciences Borregaard	-	Used before 2000. Risk of establishment + unclear systematics + can attack endangered species.
<i>Trichogramma cacoeciae</i>	-	Trichogrammatidae	Lepidoptera	Sommerfugler	Europe	Widespread	1980	Denmark, France, Germany, Hungary	Outdoors			-	
<i>Trichogramma cordubensis</i>	-	Trichogrammatidae	Lepidoptera	Sommerfugler ( <i>Autographa gamma</i> , <i>Chrysodeixis chalcites</i> , <i>Phlogophora meticulosa</i> , <i>Peridroma saucia</i> , <i>Xestia c-nigrum</i> and <i>Noctua pronuba</i> )	Mediterranean (Algeria, Egypt, France, Iran, Morocco, Portugal, Spain)	Widespread	1980	France	Indoors/ outdoors	9-36 °C (optimalt: 21-26 °C og 60-70 % RF )		-	
<i>Trichogramma dendrolimi</i>	-	Trichogrammatidae	Lepidoptera	Sommerfugler	Europe	Widespread	1985	Germany, Slovakia	Outdoors			-	
<i>Trichogramma evanescens</i>	Moth egg parasitoid	Trichogrammatidae	Lepidoptera (including stored products)	Sommerfugler	Europe	Widespread	1993	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Italy, Jersey, Jordan, Netherlands, Portugal, Slovakia, Spain, Tunisia, UK	Indoors/ outdoors			-	
<i>Trichogramma pintoi</i>	-	Trichogrammatidae	Lepidoptera ( <i>Ostrinia nubilalis</i> , <i>Helicoverpa armigera</i> , <i>Cydia nigricana</i> , <i>Cydia pomonella</i> , <i>Cydia funebrana</i> , <i>Plutella xylostella</i> , <i>Mamestra brassicae</i> , <i>Lacanobia oleracea</i> )	Sommerfugler	Palearctic, Near East, Nearctic, Neotropical- & Oriental region,	Widespread	2002 (Hungary)	Belarus, Czech Republic, Hungary, Moldova, Poland, Russia, Slovakia, Ukraine, Uzbekistan	Indoors/ outdoors			-	
<i>Trichopria drosophilae</i>	-	Diapriidae	Pupal parasitoid of <i>Drosophila suzukii</i>	Pupper av <i>Drosophila suzukii</i>	Worldwide, mainly in tropical/ Mediterranean/ warmer temperate climatic areas	France, Germany, Greece, Israel, Italy, Morocco, the Netherlands, Spain	2015 (Italy)	Italy (by 2015), Spain (2017) and Switzerland (2017)	Outdoors/ Indoors		Biplanet		
<i>Chrysoperla carnea</i> *	Green lacewing/ Vintergulløye Vanlig gulløye	Chrysopidae	Aphididae etc.	Bladlus, m.fl.	Cosmopolitan	Widespread	1987	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK	Outdoors/ indoors	12- 35 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMIJLØ AS Bombus Natur AS	Recorded. Used before 2000. Applied in 2001 but not registered because of risk of genetic mixing and unclear systematics. Applied 2nd time in 2012. Conducted a survey of the species in Norway in 2013-2014, and had a new risk assessment in 2014. The products were registered 2015.

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Scientific name	English/ Norwegian Name	Taxonomy	Target pests (ENG)	Target pests (NO)	Origin	Distribution	Introduced	Used in EPPO countries	Use	Optimal climate	Manufacturers	Norwegian importer	Norwegian evaluation
<i>Franklinothrips megalops</i>	-	Aeolothripidae	Thysanoptera	Trips	Africa, Israel, India	Israel, Tunisia	1992	Belgium, France, Netherlands, Spain	Indoors		Borregaard	-	
<i>Franklinothrips vespiformis</i>	-	Aeolothripidae	Thysanoptera	Trips	Asia	Israel, Portugal	1990	Belgium, Denmark, France, Germany, Israel, Netherlands, Portugal, Switzerland	Indoors			-	
<i>Karnyothrips melaleucus</i>	-	Phlaeothripidae	Coccidae, Diaspididae ( <i>Howardia biclavis</i> )	Skallskjoldlus, panserskjoldlus	Pantropical	Portugal (Madeira)	1994	Belgium, Denmark, France, Netherlands, Spain	Indoors			-	
<i>Amblydromalus (syn. Typhlodromalus) limonicus</i>	-	Phytoseiidae	Thrips and whiteflies (mainly Bemisia tabaci)	Trips og mellus (hovedsakelig bomullsmellus)	North, Central and South America, Hawaii, New Zealand and Australia	Established in north-east Spain	2010	Austria, Belgium, Denmark, England, Finland, France, Germany, Ireland, the Netherlands, Poland, Russia and Ukraine	Indoors/ outdoors	Active at temp. > 13 °C	KOPPERT B.V. Bioline AgroSciences Borregaard	-	Applied for approval in Norway in 2019. Efficacy evaluation will be conducted February 2020.
<i>Amblyseius (Neoseiulus) andersoni</i>	-	Acarina	<i>Aculops lycopersicae</i> , <i>Aculus schlechtendali</i> , <i>Panonychus ulmi</i> , <i>Phytonemus pallidus</i> , <i>Polyphagotarsonemus latus</i> , <i>Tranychrus urticae</i> , <i>T. cinnabarinus</i>	Galmidd, dvergmid og spinnmidd	Palaeartic and Nearctic	Widespread	2006	France, Guernsey, Italy, Netherlands, Poland, Slovenia, Spain, UK, (Sweden)	Indoors/ outdoors	Active at temp. > 6- 8 °C	Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	-	Not found in Norway, but in Sweden (Skåne). NIBIO conducted a survey in 2016 to check if the species occur naturally in Norway. The species was not found. A company applied for approval in Norway in 2019. NIBIO has asked for more efficacy data (according to reference list). VKM published risk evaluations in April 2020.
<i>Amblyseius (Neoseiulus) barkeri</i>	Thrips predatory mite/ Trips-rovmidd	Phytoseiidae	Thysanoptera ( <i>Thrips tabaci</i> , <i>Frankliniella occidentalis</i> ), Tarsonemidae	Trips og dvergmid	Europe	Widespread	1981	Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Slovakia, Switzerland	Indoors		BioProduction ApS Bioline AgroSciences	-	Recorded. Used before 2000
<i>Amblyseius (Neoseiulus) degenerans</i>	Thrips predatory mite/ Trips-rovmidd	Phytoseiidae	Thysanoptera (Tetranychidae)	Trips (Spinnmidd)	Africa/ Mediterranean	Mediterranean	1993	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Jersey, Netherlands, Poland, Spain, Switzerland, Tunisia, Turkey, UK	Indoors	20-25 °C 60- 90 % RF (effektiv ved lav RF)	Biobest NV Borregaard	-	Used before 2000
<i>Amblyseius (Typhlodromus) swirskii</i>	Spider mite predatory mite / Mellus-rovmidd	Phytoseiidae	<i>Bemisia tabaci</i> , <i>T. vaporariorum</i> , <i>Frankliniella occidentalis</i>	Bomullsmellus, veksthusmellus og amerikansk blomstertrips	East of Mediterranean region (Israel, Italy, Cyprus, Greece and Egypt)	Mediterranean	2005	Austria, Belarus, Belgium, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Israel, Italy, Jersey, Morocco, the Netherlands, Norway, Poland, Spain, Sweden, Turkey, UK	Indoors/ outdoors		KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGRO AS VEKSTMIJLØ AS Bombus Natur AS	Registered 2006
<i>Cheyletus eruditus</i>	Storage mite predator	Cheyletidae	Storage mites, spider (foliage) mites	Lagermidd og spinnmidd	Indigenous	Belgium, Israel, Netherlands	1985	Belgium, Czechia, France, Germany, Netherlands	Indoors			-	
<i>Euseius gallicus</i>	-	Phytoseiidae	Whiteflies (Aleyrodidae) and thrips (Thysanoptera)	Mellus og trips	Indigenous	Belgium, France, Germany, Netherlands, Tunisia, Turkey	2010	Belgium, France, Germany, Netherlands, Poland and Ukraine	Indoors			-	
<i>Hypoaspis aculeifer</i>	Fungus gnat predatory mite/ Jordrovmidd	Laelapidae	Sciaridae, <i>Rhizoglyphus echinopus</i>	Hærmygg og løkmidd	Europe	Widespread	1995	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Switzerland, UK	Indoors	15- 32 °C (optimal: 25 °C )	KOPPERT B.V. BioProduction ApS	LOG AS NORGRO AS	Recorded. Used before 2000. Registered 2001 and 2007

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<b><i>Macrocheles robustulus</i></b> (Syn. <i>Holostaspis subbadius</i> , <i>Macrocheles coprophila</i> )	soil-dwelling predatory mite	Macrochelidae	Soil dwelling pests like thrips (pupae) and sciarids (larvae)	Jordlevende stadier av hærmygg og trips, og egg av vinkelpyralide	Cosmopolitan	Austria, Bulgaria, Czech Republic, Georgia, Germany, Greece, Hungary, Italy, Poland, Russia, Slovakia, Sweden and the UK	2010	Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Poland, Russia, Spain, Sweden, the UK and Ukraine	Indoors		Koppert B.V.	-	
<b><i>Metaseiulus occidentalis</i></b>	-	Phytoseiidae	Tetranychidae	Spinnmidd	Nearctic	?	1991	Denmark, France, Greece, Guernsey, Jersey, Netherlands, Poland, Spain, UK	Indoors/ outdoors			-	Used before 2000
<b><i>Neoseiulus californicus</i></b> (non-diapausing strain only)	Thrips predatory mite/ Trips-rovmidd	Phytoseiidae	Tetranychidae	Spinnmidd	S.N. America/ California, Mediterranean	Israel	1985	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Israel, Italy, Jersey, Malta, Netherlands, Poland, Portugal, Slovenia, Spain, Switzerland, Tunisia, UK (restricted under license)	Indoors/ outdoors	15-30 °C og 60-70 % RF	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	-	Used before 2000. Uncertainties about distribution and cold tolerance. Risk of establishment.
<b><i>Neoseiulus cucumeris</i></b>	Thrips predatory mite/ Trips-rovmidd	Phytoseiidae	Thysanoptera ( <i>T. tabaci</i> , <i>F. occidentalis</i> )	Trips (nelliktrips, amerikansk blomstertrips)	Cosmopolitan	Widespread (not present in Sweden, Finland, Norway)	1985	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Israel, Italy, Jersey, Jordan, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK	Indoors/ outdoors	15-30 °C og 50-90 % RF	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGMRO AS VEKSTMILJØ AS Bombus Natur AS	Recorded. Used before 2000. Registered 2001 and 2007
<b><i>Phytoseiulus persimilis</i></b>	Red spider mite predatory mite/ Midd-rovmidd	Phytoseiidae	Tetranychidae ( <i>Tetranychus urticae</i> )	Spinnmidd (veksthusspinnmidd)	Mediterranean	Southern Europe	1968	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Hungary, Ireland, Italy, Jersey, Jordan, Lithuania, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, UK	Indoors/ outdoors	20-28 °C og 75-85 % RF	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGMRO AS VEKSTMILJØ AS Bombus Natur AS	Recorded. Used before 2000. Registered 2001 and 2007
<b><i>Stratiolaelaps scimitus</i></b> (Syn. <i>Hypoaspis miles</i> )	Fungus gnat predatory mite/ Jordrovmidd	Laelapidae	Sciaridae, <i>Rhizoglyphus echinopus</i>	Hærmygg og løkmidd	Palearctic	Widespread	1994	Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, UK	Indoors	15- 32 °C (optimal: 25 °C )	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	LOG AS NORGMRO AS VEKSTMILJØ AS	Used before 2000. Registered 2001 and 2007
<b><i>Traneius</i> (syn. <i>Amblyseius montdorensis</i>)</b>	Thrips predatory mite	Phytoseiidae	Aleyrodidae ( <i>Trialeurodes</i> spp. and <i>Bemisia</i> spp.), thrips ( <i>Frankinella occidentalis</i> and <i>Thrips tabaci</i> ) and Eriophyidae ( <i>Aculops lycopersici</i> )	Mellus, trips og gallmidd	Pacific Islands and western areas of the Australian mainland	-	2004	Belgium, Denmark, Finland, France, Germany, Greece, the Netherlands, Poland, Romania, Spain, UK, Norway, Sweden,	Indoors/ outdoors	Active > 12 °C. Optimal: 20-27 °C og 60-65 % RF	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences Borregaard	NORGMRO AS Bombus Natur AS	Registered 2017
<b><i>Typhlodromus pyri</i></b>	Fruit tree predatory mite/ Middrovmidd	Phytoseiidae	<i>Panonychus ulmi</i> , <i>Tetranychus urticae</i> , <i>Eriophyes vitis</i> , <i>Epirimerus vitis</i>	Fruktremidd, veksthusspinnmidd	Europe/Nearctic	Widespread	1985	Austria, Belgium, Czechia, Denmark, France, Germany, Hungary, Portugal, Slovakia, Slovenia	Outdoors	15-30 °C	BioProduction ApS	-	Recorded. Used before 2000



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<i>Heterorhabditis bacteriophora</i>	Beneficial nematode/ Nyttenematode	Heterorhabditidae	Vine weevils ( <i>Otiarhynchus</i> spp.)	Rotsnutebiller	South and central Europe/ North America	South and central Europe	1984	Austria, Belgium, France, Germany, Italy, Netherlands, Slovenia, Switzerland, <b>Norway</b>	Indoors/ outdoors	12-30 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences BASF Borregaard	LOG AS NORGRØ AS VEKSTMILO AS BASF	Used before 2000, but not recorded in Norway (in survey 2014). Registered 2015.
<i>Heterorhabditis downsi</i>	Beneficial nematode/ Nyttenematode	Heterorhabditidae	Vine weevils ( <i>Otiarhynchus</i> spp.), <i>Phyllopertha horticola</i> , <i>Hoplia philanthus</i> , <i>Melolontha melolontha</i> , <i>Hyllobius abietis</i>	Rotsnutebiller og oldenborrer	Europe	Denmark, Germany, Hungary, Ireland, Italy, UK	2001	Ireland, UK	Indoors/ outdoors	Soil temperatur above 8 °C	e-nema GmbH	-	
<i>Heterorhabditis megidis</i>	Beneficial nematode/ Nyttenematode	Heterorhabditidae	Vine weevils ( <i>Otiarhynchus</i> spp.)	Rotsnutebiller	Europe	Widespread	1984	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Slovakia, Spain, Switzerland, Tunisia, UK	Indoors/ outdoors	18-25 °C	The species is not anymore for sale in Europe/ Norway (replaced by <i>H. bact.</i> ).	LOG AS NORGRØ AS VEKSTMILO AS	Used before 2000. Registered 2001 and 2007.
<i>Phasmarhabditis hermaphrodita</i>	Beneficial nematode/ Nyttenematode	Phasmarhabditidae	Slugs	Snegler	Central Europe	Widespread (except in Northern countries)	1984	Belgium, Denmark, France, Germany, Guernsey, Italy, Jersey, Netherlands, UK, <b>Sweden</b> , <b>Norway</b>	Indoors/ outdoors	5-25 °C (optimal: 15-20 °C)	Biobest NV BASF Borregaard	BASF VEKSTMILO AS	<i>P. californica</i> is not yet recorded, but the bacteria <i>Moraxella osloensis</i> are recorded as a natural species in Norway (in 2001?). Nemaslug was registered 2005?
<i>Steinernema carpocapsae</i>	Beneficial nematode/ Nyttenematode	Steinernematidae	Vine weevils ( <i>Otiarhynchus</i> spp.), Sciaridae, soil insects (and codling moth)	Rotsnutebiller, hærmygglarver, sommerfugllarver o.a. insekter i jord	Europe (Holarctic)	Widespread	1984	Belgium, Denmark, France, Germany, Guernsey, Italy, Jersey, Netherlands, Portugal, Slovenia, Sweden, UK	Indoors/ outdoors	18-25 °C (pH = 3- 5)	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences BASF	BASF	Used before 2000. <b>Recorded 2001</b> (after the evaluation). New application submitted 2016. MT authorized the nematode in 2017.
<i>Steinernema feltiae</i>	Beneficial nematode/ Nyttenematode	Steinernematidae	Melolonthidae, Sciaridae etc.	Hærmygglarver, oldenborrelarver	Europe (Holarctic)	Widespread	1984	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Guernsey, Ireland, Italy, Jersey, Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK	Indoors/ outdoors	18-25 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences BASF Borregaard	LOG AS VEKSTMILO AS BASF	Used before 2000. Registered 2001 and 2007
<i>Steinernema glaseri</i>	White grub parasitic nematode/ Nyttenematode	Steinernematidae	Soil insects like Coleoptera (eg. Japanese beetle), and some Lepidoptera, Orthoptera, etc.	Insekter i jord (biller, sommerfugllarver, etc.)	Argentina, Brazil, China, Czech Republic, Palestine, Portugal, Republic of Korea, Slovak Republic, Spain, Switzerland, the USA	Czech Republic, Portugal, Slovak Republic, Spain, Switzerland	2004	Belgium, Netherlands	Indoors/ outdoors	Optimal: 25-35 °C	(Praxis), (Greenfire), (Intrachem)	-	Expensive to produce. Occasionally "lose" its bacterial symbiote. Difficult to contain within formulations. Additional technological advances are needed.

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<i>Steinernema kraussei</i>	Beneficial nematode/ Nyttenematode	Steinernematidae	<i>Otiorynchus sulcatus</i> and other <i>Otiorynchus</i> species	Veksthusnutebille, o.a. rotsnutebille-arter	Throughout Europe and North America	Widespread	2001 (in Ireland)	Ireland, Norway, Slovenia, most of other European countries	Indoors/ outdoors	5-30 °C	KOPPERT B.V. Biobest NV BioProduction ApS Bioline AgroSciences BASF	BASF	Recorded 2001 and registered 2008

1) Mix of *Dacnusa sibirica* and *Diglyphus isaea* OR *Encarsia formosa* and *eretmocerus eremicus*

**Number of macroorganisms registered in Eppo:** 107

**Number of macroorganisms registered in Norway:** 26

**Number of macroorganisms recorded naturally in Norway:** 31

Microbial biocontrol agents against plant pests - ref. EU Pesticides database

Updated August 2021

Red text = organism registered in Norway (<http://www.mattilsynet.no/plantevernmidler/godk.asp>)

Green text = organism (not subsp. or strain) recorded naturally in Norway ([http://www.entomologi.no/journals/nje/2002-1/NJE\\_49\\_01\\_2002.pdf](http://www.entomologi.no/journals/nje/2002-1/NJE_49_01_2002.pdf))

Active Substance ID	Scientific name	Classification	Origin	Authorised in EU countries <sup>1)</sup>	Year of first authorisation	Distribution	Target pests (ENG/ latin name)	Target pests (NO name)	Use (crop/ places)	Optimal climate	Products	Manufacturer	Norwegian evaluation
863	<i>Adoxophyes orana granulovirus</i> strain BV-0001	Virus	Originally isolated from infected larvae of <i>Adoxophyes orana</i>	BE, DE, DK, FR, IT, PL, UK	2004/2013	Widespread natural occurrence	Summer fruit tortrix ( <i>Adoxophyes orana</i> )	Fruktskallvikler	Outdoors	-	Capex	Andermatt	-
265	<i>Akanthomyces muscarius</i> Ve6 (formerly <i>Lecanicillium muscarium</i> strain Ve6)	Fungus	First discovered in Germany in 1870. Originally isolated from aphids and whiteflies.	BE, DK, ES, FR, IT, NL, UK	2009	Occurs widely in nature	Whiteflies, thrips, aphids (except <i>Macrosiphonia sanborni</i> )	Mellus, trips, bladlus (unntatt krysantemum-bladlus)	Indoors/ outdoors. Mainly on protected glasshouse crops.	18-28°C and 70-80% RF for several days after application	Mycotal	L.O.G.	Mycotal and Vertalec were registered in Norway, but withdrawn in 2004 because MT required documentation on the toxins produced by the fungus during infection. Vertalec ( <i>L. longisporum</i> Ve2) was withdrawn in EU because of "its small market" (host range).
992	<i>Bacillus firmus</i> strain I-1582	Bacterium	Strain originally isolated from agricultural soil in Israel in 2000.	BE, BG, CZ, DE, DK, EL, ES, FR, NL, PT, RO, SE, SI, UK	2013	A naturally occurring soil bacterium	Nematodes in cucumber and carrots: f.ex: <i>Meloidogyne incognita</i> and <i>Heterodera carota</i>	Nematoder i agurk og gulrot	Indoors/ outdoors: Vegetables, fruit, herbs, cotton, ornamentals, turf (leisure - golf courses)	-	Flocter	Bayer	-
1269	<i>Bacillus thuringiensis</i> subsp. <i>Aizawai</i> strain ABTS-1857	Bacterium	Natural in soil	EL, ES, FR, IT, PL	2009	Occur widely in insect-rich soils, either as vegetative cells or as spores.	Lepidoptera, particularly <i>Spodoptera</i> , <i>Plutella xylostella</i> and <i>Chrysodeixis chalcites</i>	Sommerfugllarver, f.eks. egyptisk/ bomullsfløy, kålmøll og gullmetalfly	Indoors/ outdoors: especially peppers, cucumbers, cabbages and lettuce.	> 12 < 30 °C	XenTari WG	Valent Biosciences/ Biobest	-
1301	<i>Bacillus thuringiensis</i> subsp. <i>Aizawai</i> strain GC-91	Bacterium	Natural in soil	BE, EL, FI, FR, IT, NL, PL, SE	2009	Occur widely in insect-rich soils, either as vegetative cells or as spores.	Lepidoptera, eg. <i>Spodoptera</i>	Sommerfugllarver f.eks. egyptisk/ bomullsfløy	Indoors/ outdoors: vegetable, fruit and others	> 12 < 30 °C	Turex 50 WP/ Agree 50 WP	Certis USA	Turex 50 WP is tested in cucumber in 1996 (not GEP-trials) and cauliflower in 2012-2016. Turex is applied for authorization in Norway 2012. VKM published the risk assessment May 2016. MT will reach a decision when they receive the new EU-MRLs
431	<i>Bacillus thuringiensis</i> subsp. <i>Aizawai</i> strains ABTS-1857 and GC-91	Bacterium	Natural in soil	BE, CY, DE, DK, IE, LU, PT, SI, UK	2009	Occur widely in insect-rich soils, either as vegetative cells or as spores.	Lepidoptera	Sommerfugllarver	Indoors/ outdoors	> 12 < 30 °C	See products above for both strains.	See manufacturers above for both strains.	-
861	<i>Bacillus thuringiensis</i> subsp. <i>israelensis</i> (serotype H-14) strain AM65-52	Bacterium	Natural in soil	DE, DK, ES, NL, SE, UK	2009	Occur widely in insect-rich soils, either as vegetative cells or as spores.	Diptera species such as mosquito larvae, fungus gnats ( <i>Sciarids</i> ) and blackfly larvae.	Hærmygglarver, vannfluelarver, mygglarver	Indoors: Water environments, glasshouses, mushroom houses	> 12 < 30 °C	Vectobac 12 AS = Gnatrol	Sumitomo	Vectobac 12 AS is tested in poinsettia in 1999. Not registered in 2002, because of insufficient tox documentation.
1270	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strain ABTS 351	Bacterium	Natural in soil	EL, ES, FR, IT, LU, PL, RO, SE	2009	Occur widely in insect-rich soils, either as vegetative cells or as spores.	Lepidoptera - <i>Lobesia botrana</i> and <i>Eupoecella ambiguella</i> on european grape	Sommerfugllarver på vindruerplanter	Indoors/ outdoors - Grapes	> 12 < 30 °C	Dipel	Sumitomo	Dipel is tested in Norway in 2003 and 2004.

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1271	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strain EG 2348	Bacterium	Natural in soil, first discovered in 1901	BG, CZ, EL, ES, FR, HR, IT, MT, PL	2009	Occur widely in insect rich soils, either as vegetative cells or as spores.	Lepidoptera - <i>Lobesia botrana</i> and <i>Eupoecelia ambiguella</i> on european grape	Sommerfugllarver på druer	Indoors/ outdoors - Grapes	> 12 < 30 °C	DelFin WG	Certis	-
1272	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strain PB 54	Bacterium	Natural in soil	EL, ES, FR, IT, RO	2009	Occur widely in insect rich soils, either as vegetative cells or as spores.	Lepidoptera/ caterpillars - different species, eg, <i>Helicoverpa</i> , <i>Plutella xylostella</i> , <i>Cydia pomonella</i> .	Sommerfugllarver, f.eks. pestfagerfly, eplevikler, kålmøll.	Indoors/ outdoors - especially tomatoes	> 12 < 30 °C	Belthirul	Probelte	-
1273	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strain SA 11	Bacterium	Natural in soil, first discovered in 1901	CZ, EL, FR, HU, IT, NL, PL	2009	Occur widely in insect rich soils, either as vegetative cells or as spores.	Lepidoptera - <i>Lobesia botrana</i> and <i>Eupoecelia ambiguella</i> on european grape	Sommerfugllarver på vindrueplanter	Indoors/ outdoors - Grapes	> 12 < 30 °C	DelFin WG	Certis	-
1463	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strain SA 12	Bacterium	Natural in soil, first discovered in 1901		2009	Occur widely in insect rich soils, either as vegetative cells or as spores.	Lepidoptera - <i>Lobesia botrana</i> and <i>Eupoecelia ambiguella</i> on european grape	Sommerfugllarver på vindrueplanter	Indoors/ outdoors - Grapes	> 12 < 30 °C	DelFin WG	Certis	-
432	<i>Bacillus thuringiensis</i> subsp. <i>Kurstaki</i> strains ABTS 351, PB 54, SA 11, SA12 and EG 2348	Bacterium	Natural in soil	BE, BG, CY, DE, DK, HR, HU, IE, IT, LT, LU, PT, SI, SK, UK	2009	Occur widely in insect rich soils, either as vegetative cells or as spores.	Lepidoptera	Sommerfugllarver	Indoors/ outdoors	> 12 < 30 °C	See products above for all strains.	See manufacturers above for all strains.	-
1282	<i>Beauveria bassiana</i> IMI389521	Fungus	Originally isolated from an infected adult coleopteran in a UK grain store in 1979.	-	2019	Occurs naturally in the soil throughout the world. Spores adhere to host cuticle and germinate.	Coleoptera pests ( <i>Oryzaephilus surinamensis</i> , <i>Sitophilus granarius</i> & <i>Cryptolestes ferrugineus</i> )	Biller ("sagtannet nøttebille", kornsnutebille & rustfarget kornbille) i lagerrom for korn.	Indoor (in empty grain-storage facilities)	> 25 < 30 °C	Bb38	-	-
1281	<i>Beauveria bassiana</i> PPR1 5339	Fungus	Originally derived from a African strain, isolated from the tortoise beetle	-	2019	Occurs naturally in many soils throughout the world.	Thrips; Whitefly; Potato tuber moth ( <i>Phthorimaea operculella</i> ); Red spider mite; Mites	Trips, mellus, potetmøll, spinnmidd	Indoors/ outdoors: Tomatoes, sweet peppers, cucumber, potatoes, onions; ornamentals, fruits, herbs, nuts	> 25 < 30 °C	Broadband	BASF	Trials have been conducted in Norway with Broadband against spider mites in cucumber and against whiteflies in pointsettia in 2013. The efficacy level were medium to low.
1183	<i>Beauveria bassiana</i> strain 147	Fungus	Originally isolated from larvae of <i>Ostrinia nubilalis</i> in France	CY, EL, ES, FR, IT, PT	1993 (in France)	Occurs naturally in the soil throughout the world. Spores adhere to host cuticle and germinate.	American palm borer ( <i>Paysandisia archon</i> ) + the palm weevil ( <i>Rhynchophorus ferrugineus</i> )	Sommerfugllarver og snutebiller på palmetrær	Indoors/ outdoors: Palm trees	The strain is not able to grow at 37 °C and above (EFSA 2015)	Ostrinil	Arysta LifeScience S.A.S	-
1275	<i>Beauveria bassiana</i> strain ATCC 74040	Fungus	Discovered 1835 by Agostino Bassi (IT) as an agent of the white muscardine disease of silk worm	BG, EL, ES, FR, LU, MT, NL, PL	2009	Occurs naturally in the soil throughout the world. Spores adhere to host cuticle and germinate.	Whitefly, mites, thrips and other pests (eg. capsid ( <i>Lygocoris</i> ), aphids, caterpillar, leafhopper, shore fly, fruit flies and sciarid flies)	Mellus, midd, trips og andre skadedyr (bl.a. teger, bladlus, sommerfugllarver, fruktfluer/ kirsebærflue, hærmygg, osv.)	Indoor/ outdoor: vegetables, ornamentals, cotton, turf, sugarcane, strawberries, tobacco, etc.	> 23 < 28 °C (the fungus is active at 5- 35 °C)	Naturalis-L	Fargro Ltd	-

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1339	<i>Beauveria bassiana</i> strain GHA	Fungus	Discovered 1835	CZ, DK, EL, ES, FI, FR, HU, MT, NL, SE, SI +NO	2009	Occurs naturally in soil throughout the world	Whiteflies, thrips, aphids, capsids, crickets and other sucking insects	Mellus, midd, trips bladteger, bladlus, og andre sugende insekter	Indoor/ outdoor: vegetables, ornamentals, cotton, turf, sugarcane, strawberries, tobacco, etc.	> 23 < 28 °C (the fungus is active at 5- 35 °C)	BotaniGard	Mycotech Ltd.	<i>Beauveria bassiana</i> is recorded and tested in Norway against thrips and whiteflies
1184	<i>Beauveria bassiana</i> strain NPP111B005	Fungus	Isolated on <i>Cosmopolites sordidus</i> in the West Indies.	CY, EL, ES, FR, IT, PT	1998 (in France)	Occurs naturally in soil throughout the world	Banana weevil <i>Cosmopolites sordidus</i> , Red palm weevil <i>Rhynchophorus ferrugineus</i>	Snutebiller på banan og palmetrær	Banana trees and ornamental pines	> 23 < 28 °C (the fungus is active at 5- 35 °C)	Ostrinil	Arysta LifeScience S.A.S	
1215	<i>Beauveria bassiana</i> ATCC 74040 and GHA	Fungus	Discovered 1835	BE, CY, CZ, DE, DK, HU, IE, IT, PT, SI, UK	2009	Occurs naturally in soil throughout the world	Aphididae, Thysanoptera, Aleyrodidae,	Bladlus, trips og mellus	Indoors/ outdoors	> 23 < 28 °C (the fungus is active at 5- 35 °C)	See products above for both strains.	See manufacturers above for both strains.	-
588	<i>Cydia pomonella granulovirus</i>	Virus	First reported in 1946 - isolated from <i>Cydia pomonella</i>	BE, BG, CZ, DE, DK, EL, ES, FI, FR, HR, HU, IE, IT, LU, NL, PL, PT, RO, SE, SI, SK, UK	1995 in USA and 2009 in EU	Occurs widely in nature	Codling moth ( <i>Cydia pomonella</i> )	Eplevikler	Outdoors (incl. home garden use)	> 15 °C Avoid precipitation and sunlight directly after treatment	Madex	Andermatt	Madex is agronomic evaluated in Norway in 2009. The application was withdrawn by Felleskjøpet in 2015. NLR applied for off-label in 2016. MT asked NLR to apply for Conserve instead.
771	<i>Helicoverpa armigera nucleopolyhedrosis virus</i> (HearNPV)	Virus	First isolated from infected <i>Helicoverpa armigera</i> larvae in 1975	CY, EL, ES, FR, IT, PT	2006/ 2013	Occurs widely in nature	<i>Helicoverpa armigera</i>	Pestfagerfly (karanteneskadedyr i Norge)	Indoors	Avoid temperatures above 30°C and direct UV-light	HELICOVEX	Andermatt	-
938	<i>Isaria fumosorosea</i> Apopka strain 97 (syn. <i>Paecilomyces fumosoroseus</i> )	Fungus	Isolated from <i>Phenococcus solani</i> on gynura in greenhouse in Apopka (USA) in 1986.	BE, EL, FI, FR, NL, PL, PT, SE	2001	Globally widespread in soils	Whiteflies ( <i>Trialetrodes vaporariorum</i> )	Mellus (veksthusmellus)	Indoors	< 35 °C (optimal: 20-28 °C)	PreFeRal WG	Thermo Trilogy Corporation/ BioBest	PreFeRal WG is registered in Norway since 2002 (by NORGRO)
1319	<i>Metarhizium anisopliae</i> var. <i>anisopliae</i> strain BIPESCO 5/F52	Fungus	Originally isolated from dead insects and first registered in 1999 in USA	BE, DE, DK, ES, FR, IE, IT, LU, NL, PT, UK	2009	Occurs naturally in soils world-wide	Coleoptera ( <i>Phyllopertha</i> , <i>Amphimallon</i> , <i>Otiarhynchus</i> , <i>Strophosoma</i> ) , Sciaridae, Thripidae, Aleyrodidae, Tetranychidae	Biller (oldenborre, rotsnutebille, m.fl.), hærmygg, trips, mellus, spinnmidd	Indoors/ outdoors: vegetables, fruits, herbs, ornamentals, oilseed crops, etc.	> 10 < 35°C (optimal: 20-30°C)	Met52	Novozymes Biologicals	<i>Metarhizium anisopliae</i> is recorded and tested in Norway
1309	<i>Pasteuria nishizawae</i> Pn1	Bacterium	First isolated from an Illinois soybean field in the mid-2000s	-	First isolated from an Illinois soybean field in the mid-2000s	Ubiquitous in most environments and found in nematodes in many different countries	Plant parasitic cyst nematode <i>Heterodera schachtii</i>	Ubiquitous, globally distributed	Outdoors: Soybeans and Sugarbeet		Clariva A19824C	Syngenta Crop Protection	-
939	<i>Paecilomyces fumosoroseus</i> Fe9901	Fungus	First described in 1904 and isolated from lepidopteran cadavers in 1992	BE, CY, EL, ES, FR, HU, IT, RO	2005/ 2013	Occurs naturally in soils around the world, including Europe, Asia, Africa and the USA.	Whiteflies	Mellus	Indoors	< 35 °C (optimal: 23-25 °C)	FuturEco Nofly	FuturEco	-

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864	<i>Purpureocillium lilacinum</i> strain 251 (former <i>Paecilomyces lilacinus</i> strain 251)	Fungus	First identified and isolated from eggs of a root-knot nematode in 1979	CY, EL, ES, FR, HR, IT	2008	A widespread soil fungus	are parasites of the eggs and larvae of nematodes ( <i>Pratylenchus</i> , <i>Globodera</i> , <i>Meloidogyne</i> )	Nematoder	Indoor/ outdoor: cucumber, tomato, zucchini, carrot, pepper, lettuce, strawberry, etc.	< 35 °C (optimal: 25-30°C) and pH 6.5	BioAct DC Prime	Bayer	-
1173	<i>Spodoptera littoralis nucleopolyhedrosis virus</i>	Virus	Originally isolated from <i>Spodoptera littoralis</i>	ES, FR, IT, PT	2007/ 2013	Occurs widely in nature	<i>Spodoptera littoralis</i>	Egyptisk bomullsfly	Indoors: leafy vegetables, strawberries and ornamentals	-	Littovir	Andermatt	-

Number of microorganisms registered in EU against plant pests:

28

Number of microorganisms registered as low risk in EU against plant pests:

3

Number of microorganisms registered in Norway against plant pests:

2

Microbial biocontrol agents against plant diseases - ref. EU Pesticides database

Updated August 2021

Red text = organism registered in Norway (<http://www.mattilsynet.no/plantevermidler/godk.asp>)

Green text = organism (not subsp. or strain) recorded naturally in Norway

  = NEW organism/ strain in EU 2019-2021

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345	<i>Ampelomyces quisqualis</i> AQ10	Fungus	1995 USA	BE, CY, DE, EL, ES, FR, IE, IT, LU, NL, SI, SK, UK	2005/2018	Occurs naturally when and where the host is present	Powdery mildew	Meldugg	Indoors/ outdoors: Grapevine, vegetables, strawberry	High humidity. No growth at temp > 37°C.	AQ-10 AQ-10 WG	Fargo ( <a href="http://www.fargro.co.uk/">http://www.fargro.co.uk/</a> ) Ecogen INC, USA	Tested against powdery mildew in cucumber in the 80's (Sundheim)
417	<i>Aureobasidium pullulans</i> (strains DSM 14940 and DSM 14941)	Fungus	Untreated apple plantation in Germany ('Golden Delicious') in 1989	BE, DE, EL, ES, FR, HU, IT, LU, NL, PL, PT, RO, SI, SK, UK	2014	Ubiquitous, globally distributed	<i>Erwinia amylovora</i> in Pome fruit. Post-harvest fungi (e.g. <i>Penicillium</i> sp., <i>Geotrichum</i> sp.) in citrus	Pærebrann, lagersopper på sitrusfrukter	Outdoors (field)  Indoor (storage room)		Blossom protect  Deccoferm	Bio-Ferm GmbH	-
1018	<i>Bacillus amyloliquefaciens</i> (former <i>subtilis</i> ) strain QST 713	Bacterium	Natural origin in soil. First described in 1835	BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, IE, IT, LT, LU, LV, NL, PL, PT, RO, SE, SI, SK, UK	2007		<i>Uncinula necator</i> and <i>Botrytis cinerea</i> in apple, pear and grapevines; <i>Monilia</i> in stone fruit, <i>Bremia lactucae</i> in lettuce	Meldugg, gråskimmel, grå/gul monilia, salatbladskimmel	Indoors/ outdoors	Normal growing conditions (10 to 30°C)	Serenade ASO/ Serenade MAX	BASF/ AgraQuest, US	Serenade ASO is tested against powdery mildew ( <i>Podosphaera xanthii</i> ) in cucumber in 2012 (Herrero) with good results. Serenade ASO is applied for authorization in Norway 2015 against fungus in different crops in greenhouse, plastic tunnels and field. VKM published the risk assessment May 2016. MT authorized the product in January 2017.
1198	<i>Bacillus amyloliquefaciens</i> strain MBI 600	Bacterium	Natural origin in soil. First described in 1835	BE, CY, CZ, DE, DK, EL, FI, FR, HU, IT, LT, NL, PL, PT, RO, SE, UK	2016		Grey mould ( <i>Botrytis</i> spp.) + Seedling fungal pathogens including <i>Fusarium</i> , <i>Pythium</i> and <i>Rhizoctonia</i> spp.	Gråskimmel, fusarium, pythiumrøte, o.a. plantesykdommer	Indoors/ outdoors in Vines; Table grapes + Wide range of crops including cereals, soybeans, cotton, legumes		SUBTILEX/ Integral Pro	BASF	Applied for testing in 2013 against storage diseases in potato. Tested against <i>Fusarium</i> spp., <i>Phoma</i> spp., <i>Helminthosporium solani</i> og <i>Polyscytatum pustulans</i> in potato trials in 2013 and 2014. Unfortunately, there was no positive effects when treating with Subtlex immediately after harvest.
1197	<i>Bacillus amyloliquefaciens</i> strain FZB24	Bacterium	Occurs widely in soils. Indigenous to the European region	BE, BG, CY, CZ, DE, EL, FR, IT, NL, PL, RO, SI, UK	2017		<i>Pseudoperonospora</i> sp. in cucurbits, <i>Phytophthora infestans</i> in potato, and <i>Botrytis</i> spp. in grapes.	Algesopper på agurk, potettørrøte, gråskimmel på druer	Indoors/ outdoors		TAEGRO	BASF	-
1078	<i>Bacillus amyloliquefaciens</i> subsp. <i>plantarum</i> D747	Bacterium	Originally isolated in Japan in 2000. Occurs widely in soils.	BE, CY, DK, EL, ES, FR, IE, IT, NL, PL, SE, SI, UK	2010/ 2015		<i>Fusarium</i> , <i>Rhizoctonia</i> , <i>Pythium</i> , Powdery Mildew, etc.	Fusarium, fittsopper, pythiumrøte, meldugg, o.a. plantesykdommer	Indoors/ outdoors in lettuce, berries, cucurbits, tomato, mushroom, etc.		Amylo-X WG	Mitsui AgriScience International	-
1079	<i>Bacillus pumilus</i> QST 2808	Bacterium	Originally isolated from a soil sample collected from Micronesia, 1998	CY, CZ, EL, FR, HR, IE, IT, NL, RO, SI, UK	2014		Powdery mildew (eg. <i>Erysiphe cichoracearum</i> , <i>Sphaerotheca fuliginea</i> )	Meldugg	Grapes outdoor, Cucumber, melon, Zucchini outdoor/ indoor		Sonata ASO	AgraQuest, US/ Bayer	Sonata ASO is not tested in Norway
1278	<i>Bacillus subtilis</i> strain IAB/BS03	Bacterium	Occurs naturally in soils	FR	2019		Downy and powdery mildew and scab	Bladskimmel, meldugg og skurv	Field lettuce, orchards and protected cucurbits	Growth temp: 4 - 35°C. Optimum growth at 28-30°C	Only experimental product?	-	-

MIKROorganismer mot PLANTESYKDOMMER

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501	<i>Candida oleophila</i> O	Fungus	Discovered 1998. Occurs widely in nature and on various fruits.	BE, EL, ES, FR, IT, NL, PL, UK	2013		Post-harvest diseases e.g. <i>Botrytis</i> and <i>Penicillium</i> (apples and pears)	Lagersykdommer, f.eks. gråskimmel og grønmmugg	Indoors/ storage facilities for apple and pears (after harvest)	Growth at 20°C was fast while growth was delayed at 3°C	Nexy (produktkode: NEX0101)	Bionext sprl	-
766	<i>Clonostachys rosea</i> strain J1446 ( <i>Gliocladium catenulatum</i> strain J1446)	Fungus	Naturally occurring, originally isolated from Finnish field soil	BE, CY, DE, DK, EE, ES, FI, FR, IE, NL, PL, SE, SI, UK	2005/ 2019		<i>Pythium</i> , <i>Rhizoctonia</i> , <i>Phytophthora</i> , <i>Fusarium</i> , <i>Didymella</i> , <i>Botrytis</i> , <i>Verticillium</i> , <i>Alternaria</i> , <i>Cladosporium</i> , <i>Helminthosporium</i> and <i>Penicillium</i>	Ulike plantesykdommer (se latinske navn)	Indoors (after harvest) OR dissemination by bumblebees to protect flowers against Botrytis	15- 25°C and RF 60-80%	Prestop/ Prestop Mix/ Prestop 4B	Verdera/ Biobest	Prestop is tested against <i>Pythium</i> in cucumber in 2008-2009 (Maria Herrero). A product is also tested against fusarium in oat in lab in 2016 and in field in 2016-18 in an EU project (ref. Ingerd Skow Hofgaard)
569	<i>Coniothyrium minitans</i> Strain CON/M/91-08 (DSM 9660)	Fungus	Occurs naturally in soils	BE, BG, CZ, DE, DK, EL, ES, FI, FR, HU, IE, IT, LU, NL, PL, PT, SE, SK, UK	2004/ 2017		<i>Sclerotinia sclerotiorum</i> and <i>S. minorin</i> in lettuce and winter rape	Storknolla råtesopp	Greenhouse and outdoors (field)	10 – 25 °C with the optimum at 20 °C	Contans	Prophyta Biologischer Pflanzenschutz GmbH	Contans is tested in Norway against <i>Sclerotinia</i> in lettuce in 2015-2016 and in 2019, with promising results.
1287	<i>Mild Pepino Mosaic Virus isolate VC 1</i>	Virus	The strain is isolated from a commercial tomato crop in NL in 2004	CZ, DE, DK, EL, ES, FR, NL, PL, SE, UK	2017		Pepino mosaic virus	Pepino-mosaikkvirus	Tomatoes indoors		V10	Valto	-
1288	<i>Mild Pepino Mosaic Virus isolate VX 1</i>	Virus	The strain is isolated from a commercial tomato crop in Belgium	CZ, DE, DK, EL, ES, FR, NL, PL, SE, UK	2017		Pepino mosaic virus	Pepino-mosaikkvirus	Tomatoes indoors		V10	Valto	-
1334	<i>Pepino mosaic virus (PepMV) Chilean (CH2) strain, mild isolate Abp2 (PEPMVO)</i>	Virus	The strain is isolated from a commercial tomato crop in Belgium	-	2021		Pepino mosaic virus (PepMV) Chilean (CH2) strain	Pepino-mosaikkvirus (PepMV) Chilean (CH2) strain	Tomatoes and other Solanaceae species		Abio Protect	Abiopep Plant Health	-
1335	<i>Pepino mosaic virus (PepMV) European (EU) strain, mild isolate Abp1 (PEPMVO)</i>	Virus	The strain is isolated from a commercial tomato crop in Belgium	-	2021		Pepino mosaic virus (PepMV) European (EU) strain	Pepino-mosaikkvirus	Tomatoes and other Solanaceae species		Abio Protect	Abiopep Plant Health	-
1187	<i>Pepino mosaic virus strain CHZ isolate 1906</i>	Virus	The strain is isolated from a commercial tomato crop in Belgium	BE, CZ, DE, EL, ES, FR, HR, HU, IT, LT, LV, NL, PL, SE, SI, SK, UK	2015		Pepino mosaic virus	Pepino-mosaikkvirus	Tomatoes indoors		PMV-01	De Ceuster N.V.	-
1294	<i>Phlebiopsis gigantea strain FOC PG 410.3</i>	Fungus		SE	2009/ 2020		<i>Heterobasidion annosum</i> and <i>H. parviporum</i> (in pine and spruce forests)	Rotkjuke	Outdoors (field)	Temp > 5 °C	Rotstop PG Suspension	Verdera	-
1295	<i>Phlebiopsis gigantea strain VRA 1835</i>	Fungus		DK, FI, FR, LV, PL, SE	2009/ 2020		<i>Heterobasidion annosum</i> and <i>H. parviporum</i> (in pine and spruce forests)	Rotkjuke	Outdoors (field)	Temp > 5 °C	Rotstop	Verdera	Rotstop registered in Norway since before 1999
1296	<i>Phlebiopsis gigantea strain VRA 1984</i>	Fungus		FI, SE	2009/ 2020		<i>Heterobasidion annosum</i> and <i>H. parviporum</i> (in pine and spruce forests)	Rotkjuke	Outdoors (field)	Temp > 5 °C	Rotstop S	Verdera	-
716	<i>Pseudomonas chlororaphis MA342</i>	Bacterium		BE, DE, DK, ES, FI, FR, IT, LT, LU, NL, PT, SE, UK	2004		Seed borne fungal disease in cereal ( <i>Pythium aphanidermatum</i> )	Rotbrann/ rothalsrâte	Closed systems indoors (seed dressing)	Does not grow above 32°C	Cerall Cedomon Cedress	Bioagri	The Norwegian importer has withdrawn the authorization of the products Cerall and Cedomon in April 2015



MIKROorganismer mot PLANTESYKDOMMER

Active Substance ID	Scientific name	Classification	Origin	Authorised in EU countries <sup>1)</sup>	Year of first authorisation	Distribution	Target pests (ENG/ latin name)	Target pests (Norwegian name)	Use (crop/ places)	Optimal climate	Products	Manufacturer/ importer	Norwegian evaluation
1084	<i>Pseudomonas</i> sp. Strain DSMZ 13134	Bacterium		BE, BG, CY, CZ, DE, EL, ES, FR, HR, IT, NL, PL, PT, RO, SE, SI, SK, UK	2014		Soil borne fungi (in potato, vegetables, flowers, etc.) eg. <i>Phytophthora infestans</i> . The strain can also control <i>Heterobasidion</i> spp. in forestry.	Potettørråte o.a. algesopper i jord. Isolatet virker også mot rotkjuke i skog.	Indoors/ outdoors		Proradix WG/	Sourcon-Padena GmbH & Co.KG	Proradix is not tested in Norway. Ideally we would prefer Norwegian trials before we can recommend approval.
1102	<i>Pythium oligandrum</i> M1	Fungus		AT, BG, CY, CZ, DE, EL, ES, FR, HU, IT, PL, PT, RO, SE, SI, SK, UK	2009		<i>Botrytis</i> , <i>Fusarium</i> , <i>Gaeumannomyces</i> , <i>Ophiostoma</i> , <i>Phialophora</i> , <i>Phoma</i> , <i>Phytophthora</i> , <i>Pseudocercospora</i> , <i>Pythium</i> , <i>Sclerotinia</i> and <i>Verticillium</i>	Ulike plantesykdommer (se latinske navn)	Outdoors (e.g. oil seed rape, wheat and spring barley in the field)	37°C	Polyversum	Biopreparaty	-
1196	<i>Saccharomyces cerevisiae</i> strain LAS02	Fungus	Natural	EL, FR, PL	2016		<i>Monilinia fructigena</i> , <i>Monilinia laxa</i> , <i>Monilinia fructicola</i> , <i>Botrytis</i> spp., <i>Botrytis cinerea</i> , <i>Alternaria</i> spp. <i>Neofabraea alba</i> and <i>Penicillium</i> spp.	Ulike plantesykdommer (se latinske navn)	Post harvest in pome fruits, stone fruits, grapevine, tomato, strawberries		ALD1202	?	March 2017: MT considers that possible impact on antibiotic resistance is not sufficiently documented.
1411	<i>Streptomyces</i> K61 (formerly <i>S. griseoviridis</i> )	Bacterium		BE, CY, DK, EE, FI, FR, HU, IT, LT, LV, NL, SE, UK	2009		Seed borne and soil borne fungi, such as <i>Fusarium</i> , <i>Pythium</i> and <i>Phytophthora</i>	Greenhouse and field (e.g. ornamentals, vegetables and herbs)			Mycostop	Verdera	Mycostop registered before 1999. April 2015: MT avslår søknad om fornyet godkjenning, fordi EFSA ikke kunne utføre risikovurdering på helsefare og rester bl.a. pga. datamangler (se vedtaksbrev). 2021: EFSA har utført ny risikovurdering, og EU har godkjent mikroorganismen
1081	<i>Streptomyces lydicus</i> strain WYEC 108	Bacterium		No authorisation in place	2010/ 2015		Seed and soil borne fungi such as <i>Fusarium</i> , <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Phytophthora</i>	Ulike plantesykdommer (se latinske navn)	Greenhouse and field (e.g. ornamentals, grass, vegetables and herbs)		Actinovate	Natural Industries Ltd.	-
1403	<i>Trichoderma afroharzianum</i> strain T-22 (Formerly <i>Trichoderma harzianum</i> strain T-22)	Fungus	Originally derived from the fusion of two auxotrophic strains T-95 & T-12	CZ, EL, FI, LV, NL, SE	2009		Soil and foliar pathogens including <i>Fusarium</i> spp., <i>Pythium</i> spp., <i>Rhizoctonia</i> spp., <i>Sclerotinia</i> spp., <i>Microdochium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomato, cucumber, sweet pepper, lettuce, carrots, ornamentals, beans, broccoli, turf, pome/ stone fruits; Indoors/ outdoors	Do not apply at temp. below 10° C since the beneficial fungi will not start growing	Triatum-P	Koppert	-
1396	<i>Trichoderma asperellum</i> (formerly <i>T. harzianum</i> ) strain ICC012	Fungus		CY, EL, ES, NL	2009		Soil-borne pathogens including <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Fusarium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomatoes, Cucumbers	Do not use the product when the soil temperature is below 10 ° C	Triatum-P	Koppert	-
1397	<i>Trichoderma asperellum</i> (formerly <i>T. harzianum</i> ) strain T25	Fungus	Natural, Originally isolated from soil in Spain in 1992	EL	2009		Soil-borne pathogens including <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Fusarium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomatoes, Cucumbers, Peppers, Courgettes, etc.	Do not use the product when the soil temperature is below 10 ° C	Tusal WG	Certis	-

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1398	<i>Trichoderma asperellum</i> (formerly <i>T. harzianum</i> ) strain TV1	Fungus	Natural, Originally isolated from soil in Spain in 1992	EL, ES	2009		Soil-borne pathogens including <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Fusarium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomatoes	Do not use the product when the soil temperature is below 10 ° C	Trianum-P	Koppert	-
165	<i>Trichoderma asperellum</i> (syn. <i>T. harzianum</i> ) strains ICC012, T25 and TV1	Fungus		DE, FR, IT, PT	2009		Preventive action against soil pathogens such as: <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Phytophthora</i> , <i>Phoma</i> , <i>Verticillium</i> and <i>Fusarium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomato indoors/ outdoors	The optimum growth and biocontrol activity is from pH 4.5-6 and 20-28 °C	Trianum-P/ TUSAL	Koppert/ Isagro USA	-
674	<i>Trichoderma asperellum</i> (strain T34)	Fungus		BE, CZ, DE, ES, FR, HU, IE, IT, NL, PL, PT, RO, SI, UK	2013		Preventive action against soil pathogens such as: <i>Fusarium</i> on Carnation, <i>Pythium</i> on Solanaceae and Cucurbitaceae crops;	Fusarium på nellik og Phythium på agurk og tomat	Indoors: Tomatoes, cucumbers, ornamentals including carnations.	The optimum growth temperature for T. a. strain T34 is <36°C	T34 Biocontrol	Biocontrol Technologies S.L., Fargro Ltd.)	-
1402	<i>Trichoderma atroviride</i> (formerly <i>Trichoderma harzianum</i> ) strain ITEM 908	Fungus	Originally isolated from soil from Apulia, Italy	HU	2009		Soil and foliar pathogens including <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Fusarium</i> and <i>Botrytis</i> spp.	Ulike plantesykdommer (se latinske navn)	Indoors/ outdoors: Forestry, tomatoes and cucumbers.	Do not use the product when the soil temperature is below 10 ° C	Trianum-P	Koppert	-
1297	<i>Trichoderma atroviride</i> (formerly <i>T. harzianum</i> ) strain IMI 206040	Fungus	Originally isolated from soil	SE	2009		Preventive action against <i>Botrytis cinerea</i> ; <i>Chondrostereum</i>	Ulike plantesykdommer (se latinske navn)	Strawberries, ornamental trees	product when the soil temperature is below 10 ° C	Trianum-P	Koppert	-
1298	<i>Trichoderma atroviride</i> (formerly <i>T. harzianum</i> ) strain T11	Fungus	Originally isolated from soil	EL, ES, FR	2009		Preventive action against soil-borne fungal pathogens including <i>Pythium</i> , <i>Rhizoctonia</i> and <i>Fusarium</i> spp.	Ulike plantesykdommer (se latinske navn)	Tomatoes	Do not use the product when the soil temperature is below 10 ° C	Trianum-P	Koppert	-
166	<i>Trichoderma atroviride</i> (formerly <i>T. harzianum</i> ) strain T11 and IMI 206040	Fungus		IT	2009		<i>Botrytis cinerea</i> in strawberry and <i>Chondrostereum purpureum</i> in ornamental trees	Gråskimmel og sølvglass	Indoors/ outdoors	Optimal: 25-30°C No growth: T> 35°C	Binab TF WP, Binab Bär, Binab Potatis, Binab Vector och Binab Växthus	BINAB Bio-Innovation AB/	Tested in 2002. There are few fungicides available to control pathogens like <i>Fusarium</i> and <i>Rhizoctonia</i> in Norway. One can expect the disease control provided by Trianum to be lower compared to chemical fungicides, but if it provides significantly better control compared to untreated plants, Trianum may be an interesting alternative.
167	<i>Trichoderma atroviride</i> strain I-1237	Fungus		CY, ES, FR, IT, PT	2013		<i>Pythium</i> spp. on carrot, <i>Rhizoctonia</i> spp. on potato and lettuce, and <i>Fusarium</i> spp. on ornamentals.	Pythiumråte i gulrot, potetskurv og fusarium i prydplanter	Indoors/ outdoors: Foliar/ Soil/ Seed treatment		Tri-Soil	Agrauxine	
1205	<i>Trichoderma atroviride</i> strain SC1	Fungus	Natural	BE, CY, CZ, DE, EL, ES, FR, HR, HU, IT, LU, NL, PL, PT, RO, SI	2016		<i>Phaeoaniella chlamydospora</i> , <i>Phaeoacremonium aleophilum</i> , <i>Diplodia seriata</i> , <i>Eutypa lata</i>	Ulike plantesykdommer (se latinske navn)	Grapes, established outdoors and in nurseries		Vintec	Biological Products for Agriculture (Bi-PA N.V.)	

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168	<i>Trichoderma gamsii</i> (formerly <i>T. viride</i> ) strain ICC080	Fungus	Isolated from a suppressive soil of central Italy	CY, DE, EL, ES, FR, IT, NL, PT	2009		Preventive action against soil pathogens such as: <i>Pythium</i> , <i>Rhizoctonia</i> , <i>Phytophthora</i> , <i>Phoma</i> , <i>Verticillium</i> and <i>Fusarium</i> spp.	Ulrike plantesykdommer (se latinske navn)	Flowers and ornamentals, Vegetables (e.g. tomato, pepper, salad, celery, eggplant, cucumber), herbs, strawberries	Most cold-tolerant isolate among <i>Trichoderma</i> spp. The optimum for growth and sporulation is pH 4-5 and 23-25 °C	Remedier WP	Isagro USA	-
169	<i>Trichoderma harzianum</i> strains T-22 and ITEM 908	Fungus		BE, DK, EE, ES, IE, IT, PL, PT, SK, UK	2009		See note above on individual strains resp. T-22 and ITEM 908	Se notat på individuelle isolat hhv. T-22 and ITEM 908	See individual strains resp. T-22 and ITEM 908	See individual strains resp. T-22 and ITEM 908	See individual strains resp. T-22 and ITEM 908	See individual strains resp. T-22 and ITEM 908	-
192	<i>Verticillium albo-atrum</i> (formerly <i>Verticillium dahliae</i> ) strain WCS850	Fungus	The strain originates from a potato field in Holland.	DE, DK, NL, SE, UK	2009/ 2019	Indigenous in soils in temperate regions and N-Europe. The strain has no natural dispersal from the site of injection	Prevent Dutch elm disease: Vascular fungus: <i>Ophiostoma novo-ulmi</i>	Almesyke	Elm trees (Ulmus spec.) in field		Dutch Trig	BTL Bomendienst B.V.	Dutch Trig was applied for authorization (mutual recognition) in Mars 2017. MT authorized the product against Dutch elm disease in June 2017.
202	Zucchini Yellow Mosaik Virus, weak strain	Virus	First isolated in France, 1986	FR	2013		Zucchini Yellow Mosaik Virus (ZYMV)	"Zucchini-gul-mosaikvirus"	Curcubites - melons, cucumbers, gherkins, squashes, zuchinis and marrow		Curbit, AgroGuard	Bio-OZ Bio-technologies Ltd	-

Number of microorganisms registered in EU against plant diseases: 41  
 Number of microorganisms registered as low risk in EU against plant diseases: 16  
 Number of microorganisms registered in Norway against plant diseases: 3