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2008/174 First record of *Tuta absoluta* in Morocco

In April 2008, damage was observed on outdoor tomato crops (*Lycopersicon esculentum*) in Bouareg in the region of Nador, North-Eastern Morocco. Affected tomato plants showed leaf mines and small holes on tomato fruits. Samples were taken to the laboratory and the pest was identified as *Tuta absoluta* (Lepidoptera: Gelechiidae – EPPO A1 List). Surveys were carried out in other tomato-growing regions but no signs of infestation have been detected, so far. In order to prevent any further spread of *T. absoluta*, phytosanitary measures were implemented and included the following: total destruction of infested tomato crops and plant debris, installation of pheromone traps, development of integrated pest management strategies (combined use of biological control agents and pesticides), surveys in tomato- and vegetable-growing regions (as the pest can also attack aubergine, potato and beans), and information campaigns to stakeholders (growers, nurserymen, extension services, etc.). This is the first report of *T. absoluta* in Morocco.
The pest status of *Tuta absoluta* in Morocco is officially declared as: **One outbreak, under eradication.**

Source: NPPO of Morocco, 2008-09.

Additional key words: new record **Computer codes:** GNORAB, MA

2008/175 First report of *Erwinia amylovora* in Belarus

Until 2007, fireblight was not known to occur in Belarus, although it was present in neighbouring countries (i.e. Latvia, Poland). In 2007, samples were collected from pear (*Pyrus communis*) and apple (*Malus domestica*) trees showing symptoms of fireblight in the region of Minsk. During these studies, six bacterial isolates were identified (PCR, SDS-PAGE analysis, pathogenicity tests) as *Erwinia amylovora* (EPPO A2 List). The authors concluded that these findings showed the need to revise plant management and quarantine measures against *E. amylovora* in Belarus.
The situation of *Erwinia amylovora* in Belarus can be described as follows: **Present, first detected in 2007 on a limited number of samples collected from the Minsk region.**

Source: Lagonenko AL, Komardina VS, Nikolaichik YA, Evtushenkov AN (2008) First report of *Erwinia amylovora* fireblight in Belarus. *Journal of Phytopathology*, **156**(10), 638-640.

Additional key words: new record **Computer codes:** ERWIAM, BY

2008/176 *Potato spindle tuber viroid* detected on ornamental *Solanaceae* in the Czech Republic

In 2007, an extensive survey on *Potato spindle tuber viroid* (*Pospiviroid*, PSTVd – EPPO A2 List) was carried out on ornamental *Solanaceae* by the Czech NPPO. The survey was mainly targeted at *Solanum jasminoides* and *Brugmansia* species. A total of 91 samples from 35 locations were tested, including 50 samples of *S. jasminoides* and 41 samples of other species (*Brugmansia* sp., *Solanum rantonnetii*, *Petunia* sp., *Lycopersicon esculentum, S. muricatum, Capsicum* sp.). The presence of PSTVd was confirmed at 25 locations, mainly on *S. jasminoides*. PSTVd was also detected in *Petunia x hybrida* 'Surfinia' samples from 2 growers, in 1 sample of *Brugmansia* and 1 sample of *S. muricatum*. In addition, during this

survey the presence of *Tomato chlorotic dwarf viroid* (*Pospiviroid*) was detected in *Petunia x hybrida* 'Surfinia' (see EPPO RS 2008/026).
The situation of *Potato spindle tuber viroid* in the Czech Republic can be described as follows: **Present, first detected in 2007 in symptomless ornamentals (***Solanum jasminoides, Brugmansia, Petunia***), under eradication**.

Source: Cervena G, Necekalova J, Mikulkova H, Levkanicova Z (2008) Viroids on petunia and other solanaceous crops in the Czech Republic. *Proceedings of the 12th International Symposium on Virus Diseases of Ornamental Plants*, Haarlem, NL, 2008-04-20/24, p 9.

Additional key words: new record **Computer codes:** PSTVD0, CZ

2008/177 Situation of *Potato spindle tuber viroid* in Austria in 2008

As reported in EPPO RS 2008/009, an incursion of *Potato spindle tuber viroid* (*Pospiviroid*, PSTVd – EPPO A2 list) was reported on ornamental Solanaceae at the beginning of 2008 and was successfully eradicated. However, PSTVd was detected again during an official survey in Vienna, Oberösterreich, Niederösterreich and Steiermark.
In Vienna, PSTVd was detected on tomatoes (*Lycopersicon esculentum* cv. Sakura) at a producer of propagation material and on *Solanum jasminoides* in a nursery. In both cases, eradication measures were imposed: all plants were destroyed; production sites and all machinery were disinfected. Investigations showed that tomato plants had been grown from seeds delivered from Germany to Austria with a plant passport from the Netherlands. The remaining seeds of this cultivar were seized and they also tested positive for PSTVd. All NPPOs concerned were informed. The origin of the infected *S. jasminoides* plants could not be determined.
Both in Oberösterreich and Steiermark, PSTVd was detected on *S. jasminoides* plants in a nursery. All plants were immediately destroyed and storage places were disinfected. The origin of the mother plants could no longer be traced.
In Niederösterreich, PSTVd was detected on *S. jasminoides* in a nursery, as well as on *S. jasminoides* and *Solanum rantonnetii* in garden centres. In all cases, eradication measures were imposed. Furthermore, at the nursery, storage places were disinfected and the sale of *S. jasminoides* plants was suspended. The origin of the *S. jasminoides* plants is unknown but the *S. rantonnetii* plants had been delivered from Germany. The German NPPO was informed accordingly.
The pest status of *Potato spindle tuber viroid* in Austria is officially declared as: **Local outbreaks, eradicated.**

Source: NPPO of Austria, 2008-08.

Additional key words: detailed record **Computer codes:** PSTVD0, AT

2008/178 Suspected findings of *Enaphalodes rufulus* (red oak borer) on wood imports: addition to the EPPO Alert List

Plant Health Inspectors in the United Kingdom intercepted consignments of sawn oak wood (*Quercus* spp.) which showed symptoms of live wood borer activity with small amounts of fresh frass observed beneath bore holes in the wood. Although it was not possible to recover and identify specimens, there were strong indications that the activity observed was caused by larvae of *Enaphalodes rufulus* (Coleoptera: Cerambycidae, red oak borer). Because *E. rufulus* is a serious pest of oaks and is probably able to establish in the UK, the affected consignments were intercepted and refused entry. Although the EPPO Secretariat has not been informed of any other interception of this pest in Europe, *E. rufulus* is an economically important wood-boring species in North America (its area of origin) and the recent UK interception suggests that it might have a pathway to enter Europe (e.g. sawn wood from North America), thus it was decided to add it the EPPO Alert List.

Enaphalodes rufulus (Coleoptera: Cerambycidae) – red oak borer

Why	In 2008, the UK NPPO intercepted consignments of sawn oak wood showing signs of infestation by wood borers. Observations strongly suggested that the wood was infested by *Enaphalodes rufulus*. Although the identity of the pest could not be ascertained, this finding suggested that *E. rufulus*, which is an economically important wood-boring insect of red oaks in North America, could enter the EPPO region via imports of oak wood.
Where	**EPPO region**: absent. **North America**: *E. rufulus* is native to North America, it occurs in the southeastern part of Canada and the eastern part of the USA. Canada (Ontario, Quebec), USA (Alabama, Arkansas, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Wisconsin).
On which plants	Most oak species (*Quercus* spp.) in eastern North America can be attacked by *E. rufulus*. Its preferred hosts belong to the red oak group (*Erythrobalanus*): *Quercus rubra* (northern red oak), *Q. velutina* (black oak), *Q. coccinea* (scarlet oak). Other oak species are less commonly attacked: *Q. alba* (white oak), *Q. stellata* (post oak), *Q. palustris* (pin oak), *Q. macrocarpa* (bur oak), *Q. lyrata* (overcup oak), *Q. laurifolia* (laurel oak). There is no data on the susceptibility of European oak species (e.g. *Q. petraea, Q. pubescens, Q. robur*).
Damage	Damage is caused by larvae which bore tunnels inside the wood of their host trees. Galleries created may then become infected with decay fungi. Damage of *E. rufulus* to oak wood can be economically important. In the 1980s, in the USA, it was estimated that 38% of oak wood used for lumber, cooperage and veneer was affected by *E. rufulus*, and could lead to 40% reduction of the tree value at the time of sawing. Normally tree mortality is not associated with *E. rufulus* infestations but in the early 2000s, severe mortality of red oaks (*Q. rubra, Q. falcata* and *Q. velutina*) was observed in the Ozark National Forest (Arkansas) and then in the nearby states of Oklahoma and Missouri. This severe oak mortality and decline which affected tens of thousands of oaks, primarily *Q. rubra,* was associated with an unprecedented outbreak of *E. rufulus*. Although there might be other factors involved (e.g. drought), *E. rufulus* was considered to be an important component of this severe oak tree decline. *E. rufulus* has a 2-year synchronous life cycle. Adults are nocturnal and can be found from mid-June to mid-August. Mating takes place on the host tree and the females lay an average of 110 eggs, mainly in bark crevices, under lichen patches and climbing vines. Young larvae bore directly through the bark and spend their first year in the phloem making small tunnels. The 2-year-old larvae make larger

tunnels and bore into the xylem where pupation takes place. The adult emerges near the original oviposition site by gnawing an oval hole through the bark. Pictures can be viewed on the Internet: http://www.invasive.org/browse/subthumb.cfm?sub=374&start=1

Dissemination: Adults can fly but data is lacking on their potential for natural spread. Over long distances, trade of wood and wood products can disseminate *E. rufulus* (imports of *Quercus* plants for planting from non-European countries are usually prohibited).

Pathway: *Quercus* wood and wood products from Canada and USA.

Possible risks: Because larvae are hidden in the wood, they may be difficult to detect during inspection. The UK interception, although not confirmed, suggests that pathways of introduction into Europe exist (e.g. sawn wood). Considering its geographical distribution in North America, it is likely that *E. rufulus* can establish under the climatic conditions of Europe. In forests, control measures are limited (removal of highly infested trees, general measures to encourage tree vigour); in parks and gardens, insecticide treatments can be applied for high value trees. One of the main uncertainties is the availability of host plants in the EPPO region. Red oaks are grown for ornamental purposes and apparently *Q. rubra* is increasingly planted in forests (because of the quality of its wood) but data is lacking on its current distribution in European forests and economic importance. In addition, data is lacking on the susceptibility of European oak species to *E. rufulus*. Nevertheless, it cannot be excluded that oak wood boring pests such as *E. rufulus* may present a risk to European forests, timber industry, nurseries and amenity trees planted in parks and gardens.

Source(s):

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NPPO of the UK, 2008-04.

INTERNET (last retrieved in 2008-10)

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USDA Forest Service. Forest Insect & Disease Leaflet 163. Red oak borer. http://www.na.fs.fed.us/spfo/pubs/fidls/Red%20Oak%20Borer/redoak.htm

EPPO RS 2008/178

Panel review date: - Entry date 2008-09

2008/179 *Scyphophorus acupunctatus* found in Sicilia, Italy

Scyphophorus acupunctatus (Coleoptera: Curculionidae – formerly EPPO Alert List) is a pest of *Agave* originating from the Americas. It has been found several times by Italy and the Netherlands on imported ornamental plants (*Beaucarnea, Dasylirion* and *Yucca*) under glasshouse conditions but did not establish (see EPPO RS 2002/046, 2003/014). In 2006, numerous larvae, pupae and adults of *S. acupuntatus* were found on *Agave americana* in

parks and gardens in the city of Catania, Sicilia (IT). From December 2006 to January 2007, *S. acupunctatus* adults (64 live – 92 dead) were collected from severely attacked *Agave* plants and the surrounding grounds in the urban centre of Catania. Several specimens were studied and reared in the laboratory. In 2007, 10 traps were installed in Catania. In addition, many *Agave, Beaucarnea, Dracaena* and *Yucca* plants growing in the urban centre of Catania and in a few other localities along the Ionian coast of Sicilia were inspected. No other specimens were observed. However, it is considered that a trapping network should be set up to verify that *S. acupunctatus* has not established in Sicilia.

Source: Longo S (2008) [Morphological and biological remarks on the Agave weevil *Scyphophorus acupunctatus* (Coleoptera: Cucurlionidae) in Sicilia]. *Bollettino di Zoologia Agraria e di Bachicoltura, Serie II*, **40**(1), 45-50 (in Italian).
Longo S (2007) [Sexual dimorphism differences between adult populations of *Rhynchophorus ferrugineus* and *Scyphophorus acupunctatus* (Coleoptera: Curculionidae) in Sicilia]. *Bollettino di Zoologia Agraria e di Bachicoltura, Serie II*, **39**(1), 45-50 (in Italian).
EPPO Alert List – Deletions from the EPPO Alert List.
http://www.eppo.org/QUARANTINE/Alert_List/deleted%20files/insects/Scyphophorus_acupunctatus.doc

Additional key words: incursion **Computer codes:** SCYPIN, IT

2008/180 Studies on the pathogenicity of *Chalara fraxinea*

Ash dieback is an emerging disease which was first observed in Poland in the 1990s but which is now spreading westwards to other European countries. A newly described fungus, *Chalara fraxinea* (EPPO Alert List), was frequently found associated with the disease but its pathogenicity remained unclear, as other potentially pathogenic fungi (*Cytospora, Diplodia, Fusarium, Phomopsis*) were also detected in declining ash trees. Studies were recently carried out in Poland to demonstrate the pathogenicity of *C. fraxinea* to common ash (*Fraxinus excelsior*). Artificial inoculations were performed in 3 field experiments on a total of 48 ash trees. Ten different Polish isolates of *C. fraxinea* were inoculated by using wood sticks colonized by mycelia. Inoculated ash trees were cut after 2, 3 or 12 months and studied in the laboratory. On all inoculated trees, necrotic lesions of very variable sizes developed and wilting occurred occasionally. Symptoms observed after artificial inoculation were identical to those seen after natural infections. *C. fraxinea* was reisolated from 39 of the 48 inoculated trees. It was also frequently found together with *Alternaria alternata*, *Cytospora* sp., *Coniothyrium olivaceum*, *Diplodia mutila*, *Fusarium* spp. and *Phomopsis*. It is also noted that because cankers are perennial, *C. fraxinea* may be outcompeted by other microorganisms, which either cause secondary cankers or act as biological control agents (e.g. in Petri dishes a pronounced inhibition of *C. fraxinea* was observed in the presence of *Diplodia mutila*). It is concluded that an artificial inoculation with *C. fraxinea* results in extended necrotic lesions under field conditions, with pronounced symptoms very similar those of natural infections. Thus, the fungus is considered to play a key role in ash dieback.

Source: Kowalski T, Holdenrieder O (2008) Pathogenicity of *Chalara fraxinea*. *Forest Pathology* **38**(6), in press.

Additional key words: etiology **Computer codes:** CHAAFR

2008/181 First report of *Chalara fraxinea* in Norway

In May 2008, *Chalara fraxinea* (EPPO Alert List) was isolated for the first time in Norway from ash trees (*Fraxinus excelsior*) presenting symptoms of ash dieback. In 2007, symptoms had been noticed but *C. fraxinea* could not be detected and damage was attributed to winter frost. At present, the disease seems to be widely distributed in southern Norway (Sørlandet) and South-Eastern Norway (Østlandet). The fungus has been isolated as far North as Hedmark county, and also in Buskerud, Vestfold, Telemark, Aust-Agder and Vest-Agder counties, but not west of Lyngdal. Symptoms were not found in Jæren (southwestern Norway). Since September 2008, phytosanitary regulations are being been implemented in Norway to prevent any further spread of the disease. Infected zones have been delimited and they include the following counties: Østfold, Oslo, Akershus, Vestfold, Buskerud, Oppland, Hedmark, Telemark, Aust-Agder and Vest-Agder. Restrictions of the movements of *Fraxinus excelsior* plants for planting have been imposed, and all pruning or mowing machinery must be disinfected before being moved to an area which is free of the disease. The situation of *Chalara fraxinea* in Norway can be described as follows: **Present, first detected in 2008, widespread in Southern and South-Eastern Norway (Sørlandet, Østlandet).**

Note: Pictures of *Chalara fraxinea* were kindly provided by Prof. Solheim and can be viewed on the EPPO Gallery of pictures. http://photos.eppo.org/index.php/album/380-chalara-fraxinea-chaafr-

Source:
Personal communication with Dr Bjørn Økland, Norwegian Forest and Landscape Institute, Ås, Norway (2008-08).
Personal communication with Prof. Halvor Solheim, Norwegian Forest and Landscape Institute, Ås, Norway (2008-09).

INTERNET (last accessed 2008-09)
Norwegian Institute of Forestry and landscape. Ash dieback. http://www.skogoglandskap.no/nyheter/2008/askens_endelikt (in Norwegian).
Mattilsynet. Regulations of 8 September 2008 concerning measures against *Chalara fraxinea*. http://www.mattilsynet.no/english/plant_health/regulations_of_8_september_2008_concerning_measures_against_chalara_fraxinea_63077

Additional key words: new record **Computer codes:** CHAAFR, NO

2008/182 First report of *Chalara fraxinea* in Finland

The NPPO of Finland recently informed the EPPO Secretariat of the first detection of *Chalara fraxinea* (EPPO Alert List) on its territory. The outbreak of the disease was detected on ash trees (*Fraxinus excelsior*) in the commune of Tuusula from samples collected in 2007. The identity of the fungus was confirmed by DNA analysis in spring 2008. Symptomatic ash trees have been found on the southern coast of Finland in an area extending from Ahvenanmaa (Åland Islands) to Tuusula. In addition, diseased ash trees have been found in several other communes (e.g. Kustavi, Hyvinkää and Rajamäki). The analysis of the samples collected from these communes is still ongoing. The magnitude of the outbreak is such that eradication of the disease is considered impossible, and therefore no eradication measures were taken. The situation of the disease in Finnish forests will be surveyed on a yearly basis.

The situation of *Chalara fraxinea* in Finland can be described as follows: **Present, first detected in 2008, along the southern coast.**

Source: NPPO of Finland (2008-10).

Additional key words: new record **Computer codes:** CHAAFR, FI

2008/183 First report of *Chalara fraxinea* in Hungary

In Hungary, symptoms of ash dieback caused by *Chalara fraxinea* (EPPO Alert List) were observed on *Fraxinus excelsior* for the first time in May and June 2008, in two forest management units located in the north-west of the country. Symptoms were characterized by shoot wilting, necrotic bark lesions, dieback of young twigs (1 to 2-year old), and xylem discoloration. The pathogen was isolated and identified (morphological characteristics) and its pathogenicity was demonstrated by wound inoculation of shoots with fungal mycelium. This is the first report of *C. fraxine*a in Hungary.
The situation of *Chalara fraxinea* in Hungary can be described as follows: **Present, first found in 2008 in the north-west.**

Source: Szabó I (2008) [Dieback of common ash (*Fraxinus excelsior*) caused by *Chalara fraxinea*.] *Növényvédelem* **44**(9), 444-446 (in Hungarian).

Additional key words: new record **Computer codes:** CHAAFR, HU

2008/184 *Ceratocystis fimbriata* f.sp. *platani* found in Isère, France

In France, outbreaks of *Ceratocystis fimbriata* f.sp. *platani* (EPPO A2 List) have been reported from southern regions (Languedoc-Roussillon, Midi-Pyrénées, Provence-Alpes-Côte d'Azur, Rhône-Alpes). In February 2008, it was found for the first time in Isère department (Rhône-Alpes region). One infected tree was detected in the city of la Tour-du-Pin (north-west of Grenoble). The infected tree and all surrounding *Platanus* within a radius of 30 m will be destroyed. It is noted that in the Rhône-Alpes region, five departments are now declared infected: Rhône (in 1992), Ain (1994), Savoie (2005), Loire (2005) and now Isère (2008). Intensive surveys are continuing in France.
The situation of *Ceratocystis fimbriata* f.sp. *platani* in France can be described as follows: **Present, scattered outbreaks (Languedoc-Roussillon, Midi-Pyrénées, Provence-Alpes-Côte d'Azur, Rhône-Alpes), under official control.**

Source: Demonmerot M (2008) Rhône-Alpes, le chancre coloré du platane est en Isère. *Phytoma – La Défense des Végétaux* n°613, 3-4.

Additional key words: detailed record **Computer codes:** CERAFP, FR

2008/185 First report of *Mycosphaerella pini* in Finland

The NPPO of Finland recently informed the EPPO Secretariat of the first detection of *Mycosphaerella pini* (EU Annexes) on its territory. The outbreak of the disease was detected on Scots pine (*Pinus sylvestris*) in the communes of Hartola, Suonenjoki and Kangasniemi. The identity of the fungus was confirmed by DNA sequencing from pure culture. In addition, symptomatic pine trees have been found in the following communes: Jämsä, Varkaus, Leppävirta, Janakkala, Pieksämäki, Padasjoki, Kuhmoinen, Lammi, Laukaa, Joutsa, Tuusula and Ristiina. However, these findings have not been confirmed by laboratory testing. The magnitude of the outbreak is such that eradication of the disease is considered impossible, and therefore no eradication measures were taken. The relatively widespread presence of the disease will be taken into account during the phytosanitary inspections of pine nurseries and places of production of ornamental conifers. The situation of the disease in Finnish forests will be surveyed on a yearly basis.
The situation of *Mycosphaerella pini* in Finland can be described as follows: **Present, first detected in 2008, observed in several communes in the south-east.**

Source: NPPO of Finland (2008-10).

Additional key words: new record **Computer codes:** CHAAFR, FI

2008/186 Situation of *Phytophthora kernoviae* in New Zealand

In New Zealand, *Phytophthora kernoviae* (EPPO Alert List) was first reported in 2006 (see EPPO RS 2006/060) from North Island. In 2005, scientists examined laboratory collections of *Phytophthora* species and they discovered the presence of *P. kernoviae*. In 2002, a sample of cherimoya (*Annona cherimola*) material had been submitted by a grower and was initially identified as being infected by a *Phytophthora* species which was assumed to be already known in New Zealand. However, the use of molecular diagnostic techniques later revealed that it was in fact *P. kernoviae*. Surveillance and tracing investigations were initiated. Further isolates collected from soil in kauri forests (*Agathis australis,* Araucariaceae) were examined and *P. kernoviae* was identified in 1 sample. Interestingly, a thesis published in 1970 and describing a *Phytophthora* species collected from soil under pine plantations was reassessed because the species description resembled *P. kernoviae*. Material was collected from the sites sampled in the 1960s (central part of the North Island) and results showed that *P. kernoviae* was present in many of those sites (Northland, Auckland, Taupo areas). It is concluded that considering the distribution of *P. kernoviae* in different areas in the North Island and the length of time it has been present in New Zealand, neither eradication nor containment were feasible options.
The situation of *Phytophthora kernoviae* in New Zealand can be described as follows: **Present, first reported in 2006 (but probably present since the 1960s), found in soil samples from North Island (Northland, Auckland, Taupo areas).**

Source: Anonymous (2008) *Phytophthora kernoviae*: Past investigation throws up new answers. *Biosecurity* **82**, March issue, p 21.

Additional key words: detailed record **Computer codes:** PHYTKE, NZ

2008/187 EPPO report on notifications of non-compliance

The EPPO Secretariat has gathered below the notifications of non-compliance for 2008 received since the previous report (EPPO RS 2008/167). Notifications have been sent directly to EPPO by Russia and Switzerland, and via Europhyt for the EU countries. The EPPO Secretariat has selected notifications of non-compliance made because of the detection of pests. Other notifications of non-compliance due to prohibited commodities, missing or invalid certificates are not indicated. It must be pointed out that the report is only partial, as many EPPO countries have not yet sent their notifications. When a consignment has been re-exported and the country of origin is unknown, the re-exporting country is indicated in brackets. When the occurrence of a pest in a given country is not known to the EPPO Secretariat, this is indicated by an asterisk (*).

Note: The NPPO of Romania has withdrawn the interception of *Pepino mosaic virus* on seeds of *Lycopersicon esculentum* imported from Israel (appearing in EPPO RS 2008/167). Two samples were found positive using DAS-ELISA, but PepMV infection was not confirmed by biological tests.

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Aleuroclava jasmini, Bemisia tabaci	*Colocasia esculenta*	Vegetables (leaves)	India	United Kingdom	1
Anoplophora chinensis	*Acer*	Plants for planting	China	Netherlands	2
Aonidiella citrina	*Fortunella*	Fruits	South Africa*	Germany	1
Bemisia	*Hypericum*	Cut flowers	Kenya	Germany	1
Bemisia tabaci	*Apium graveolens*	Vegetables	Thailand	France	1
	Asarum	Plants for planting	Japan	United Kingdom	1
	Bacopa	Plants for planting	Singapore	United Kingdom	1
	Citrus maxima, Eryngium foetidum, Mangifera indica, Ocimum basilicum, Piper sarmentosum	Fruit and vegetables	Thailand	Ireland	1
	Colocasia	Vegetables	India	United Kingdom	3
	Colocasia esculenta	Vegetables	India	United Kingdom	1
	Echinodorus	Aquarium plants	Singapore	United Kingdom	1
	Eryngium foetidum	Vegetables (leaves)	Thailand	France	29
	Eryngium foetidum	Vegetables (leaves)	Vietnam	France	3
	Euphorbia	Cuttings	Israel	United Kingdom	1
	Euphorbia pulcherrima	Cuttings	Ethiopia	Finland	1
	Euphorbia pulcherrima	Plants for planting	Ethiopia	Sweden	1
	Euphorbia pulcherrima	Plants for planting	Germany	United Kingdom	1
	Euphorbia pulcherrima	Cuttings	Kenya	Finland	1
	Euphorbia pulcherrima	Plants for planting	Kenya	Sweden	3
	Euphorbia pulcherrima	Cuttings	Uganda	Netherlands	1
	Eustoma	Cut flowers	Israel	Netherlands	1
	Gardenia, Hibiscus	Plants for planting	Côte d'Ivoire	France	1
	Gypsophila	Cut flowers	Israel	Netherlands	1
	Hemigraphis	Aquarium plants	Thailand	United Kingdom	1
	Hibiscus	Plants for planting	Côte d'Ivoire	Belgium	1
	Hibiscus rosa-sinensis	Plants for planting	Netherlands	United Kingdom	2
	Hypericum	Cut flowers	Zimbabwe	United Kingdom	1
	Impatiens	Cuttings	Israel	United Kingdom	1
	Jatropha	Plants for planting	Spain (Canary Isl.)	Spain	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
B. tabaci (cont.)	*Ocimum*	Vegetables (leaves)	Thailand	Sweden	2
	Ocimum basilicum	Vegetables (leaves)	Colombia	United Kingdom	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Czech Republic	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Ireland	7
	Ocimum basilicum	Vegetables (leaves)	Israel	Netherlands	3
	Ocimum basilicum	Vegetables (leaves)	Israel	United Kingdom	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	France	8
	Ocimum basilicum	Vegetables (leaves)	Thailand	United Kingdom	3
	Ocimum sanctum	Vegetables (leaves)	Thailand	France	4
	Ocimum sanctum	Vegetables (leaves)	Thailand	United Kingdom	4
	Penstemon	Cuttings	Costa Rica	Netherlands	1
	Solanum melongena	Vegetables	Dominican Rep.	United Kingdom	1
	Solidago	Cut flowers	Israel	Netherlands	1
Bemisia tabaci, Helicoverpa armigera, Spodoptera littoralis	*Rosa, Eustoma*	Cut flowers	Israel	Netherlands	1
Bemisia tabaci, Liriomyza	*Ocimum basilicum*	Vegetables (leaves)	Israel	Czech Republic	1
Bemisia tabaci, Liriomyza trifolii	*Eustoma, Gypsophila*	Cut flowers	Israel	Netherlands	1
Bidens pilosa	*Glycine max*	Stored products	Netherlands	Russia	9
Carposina niponensis	*Malus domestica*	Fruits	China	Russia	2
Ceratothripoides brunneus, Diaphania indica	*Momordica*	Vegetables	Kenya	Germany	1
Clavibacter michiganensis subsp. *michiganensis*	*Lycopersicon esculentum*	Seeds	Thailand	France	1
Clavibacter michiganensis subsp. *sepedonicus*	*Solanum tuberosum*	Seed potatoes	Netherlands	Bulgaria	1
	Solanum tuberosum	Ware potatoes	Poland	Bulgaria	1
Coleoptera, Thripidae	*Dianthus*	Cut flowers	Egypt	Cyprus	1
Corynespora cassiicola	*Ocimum*	Vegetables (leaves)	Thailand	Germany	1
	Ocimum sanctum	Vegetables (leaves)	Thailand	Germany	2
Cuscuta campestris	*Ocimum basilicum*	Vegetables (leaves)	Egypt	Russia	1
Diaphania indica	*Momordica charantia*	Vegetables	Kenya	United Kingdom	1
Diaphania indica, Thysanoptera	*Momordica*	Vegetables	Kenya	Germany	1
Ditylenchus, Helicotylenchus, Meloidogyne	*Trachycarpus fortunei*	Plants for planting	China	Germany	1
Elsinoe	*Citrus limon*	Fruits	Argentina	Spain	2
Elsinoe australis	*Citrus limon*	Fruits	Argentina	Spain	2
Elsinoe fawcettii	*Citrus limon*	Fruits	Argentina	Spain	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Erwinia stewartii (suspected)	*Zea mays*	Seeds	USA	Germany	1
Frankliniella hemerocallis	*Hemerocallis*	Plants for planting	USA	United Kingdom	1
Frankliniella occidentalis	*Alstroemeria*	Cut flowers	Colombia	Russia	1
	Alstroemeria, Chrysanthemum, Rosa	Cut flowers	(Lithuania)	Russia	2
	Alstroemeria, Limonium, Rosa	Cut flowers	Netherlands	Russia	1
	Artemisia dracunculus	Vegetables (leaves)	Israel	Russia	1
	Brassica	Vegetables	Macedonia Rep.	Russia	1
	Capsicum annuum	Vegetables	(Lithuania)	Russia	1
	Capsicum annuum	Vegetables	Morocco	Russia	1
	Capsicum annuum	Vegetables	Spain	Russia	1
	Chrysanthemum	Pot plants	Netherlands	Russia	1
	Chrysanthemum, Dianthus, Helianthus, Rosa	Cut flowers	(Lithuania)	Russia	1
	Chrysanthemum, Dianthus, Rosa	Cut flowers	Netherlands	Russia	1
	Chrysanthemum, Rosa	Cut flowers	(Lithuania)	Russia	1
	Dianthus caryophyllus	Cut flowers	China	Russia	1
	Dianthus caryophyllus	Cut flowers	Netherlands	Russia	1
	Dianthus caryophyllus	Cut flowers	Turkey	Russia	1
	Dianthus caryophyllus, Gerbera	Cut flowers	Turkey	Russia	1
	Eustoma	Cut flowers	Israel	Russia	2
	Fragaria ananassa	Fruits	(Netherlands)	Russia	2
	Fragaria ananassa	Fruits	Spain	Russia	2
	Fragaria ananassa	Fruits	Turkey	Russia	1
	Fragaria ananassa, Prunus persica var. *nectarina*	Fruits	Spain	Russia	1
	Gerbera	Cut flowers	Israel	Russia	2
	Helianthus annuus	Cut flowers	Israel	Russia	2
	Lactuca sativa	Vegetables	(Netherlands)	Russia	1
	Lycopersicon esculentum	Vegetables	Spain	Russia	6
	Prunus armeniaca	Fruits	Italy	Russia	2
	Prunus armeniaca	Fruits	Spain	Russia	3
	Prunus domestica	Fruits	Italy	Russia	1
	Prunus persica	Fruits	Greece	Russia	6
	Prunus persica	Fruits	Italy	Russia	3
	Prunus persica	Fruits	Spain	Russia	6
	Prunus persica var. *nectarina*	Fruits	Greece	Russia	1
	Prunus persica var. *nectarina*	Fruits	Italy	Russia	2
	Prunus persica var. *nectarina*	Fruits	Spain	Russia	1
	Pyrus communis, Prunus persica var. *nectarina*	Fruits	(Lithuania)	Russia	1
	Rubus fructicosus	Fruits	(Netherlands)	Russia	2
	Rubus fructicosus	Fruits	Netherlands	Russia	3
Globodera pallida, Globodera rostochiensis	*Solanum tuberosum*	Ware potatoes	Italy	Ireland	10
Globodera rostochiensis	*Solanum tuberosum*	Ware potatoes	Italy	Ireland	2

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Grapholita molesta	*Malus domestica*	Fruits	China	Russia	1
	Prunus persica	Fruits	Greece	Russia	1
	Pyrus communis	Fruits	China	Russia	2
Guignardia citricarpa	*Citrus limon*	Fruits	South Africa	Belgium	2
	Citrus limon	Fruits	South Africa	Netherlands	5
	Citrus maxima	Fruits	Thailand*	Netherlands	1
	Citrus paradisi	Fruits	Argentina	Netherlands	1
	Citrus sinensis	Fruits	Ghana*	United Kingdom	5
	Citrus sinensis	Fruits	South Africa	Belgium	1
	Citrus sinensis	Fruits	South Africa	Netherlands	10
Gymnosporangium asiaticum	*Juniperus chinensis*	Plants for planting	Japan	United Kingdom	1
Haritalodes derogata	*Hibiscus rosa-sinensis*	Plants for planting	Sri Lanka	Netherlands	1
Helicotylenchus, Meloidogyne	*Phyllostachys, Trachycarpus fortunei*	Plants for planting	China	Belgium	1
Helicoverpa armigera	*Dianthus*	Cut flowers	Israel	Netherlands	1
	Dianthus	Cut flowers	Morocco	United Kingdom	1
	Dianthus	Cut flowers	Spain	United Kingdom	1
	Eryngium	Cut flowers	Tanzania	Netherlands	2
	Eustoma	Cut flowers	Israel	Netherlands	1
	Gypsophila	Cut flowers	Israel	Netherlands	1
	Ocimum	Vegetables (leaves)	Thailand	Netherlands	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Czech Republic	2
	Ocimum basilicum	Vegetables (leaves)	Israel	Netherlands	2
	Pisum sativum	Vegetables	Egypt	Belgium	1
	Rosa	Cut flowers	Burundi	Netherlands	2
	Rosa	Cut flowers	Ethiopia	Netherlands	1
	Rosa	Cut flowers	India	Netherlands	3
	Rosa	Cut flowers	Kenya	Netherlands	8
	Rosa	Cut flowers	Tanzania	Netherlands	4
	Rosa	Cut flowers	Uganda	Netherlands	14
	Rosa	Cut flowers	Uganda	Netherlands	1
	Rosa	Cut flowers	Zambia	Netherlands	1
	Rosa	Cut flowers	Zimbabwe	Netherlands	12
	Solidago	Cut flowers	Zimbabwe	Netherlands	1
	Zea mays	Vegetables	Uganda	United Kingdom	1
Helicoverpa armigera, Spodoptera littoralis	*Rosa*	Cut flowers	Zambia	Netherlands	1
	Rosa	Cut flowers	Zimbabwe	Netherlands	1
Helicoverpa armigera, Spodoptera litura	*Rosa*	Cut flowers	India	Netherlands	1
Hirschmanniella	*Cryptocoryne*	Aquarium plants	Indonesia	France	1
	Cryptocoryne	Aquarium plants	Singapore	France	1
Leptinotarsa decemlineata	*Pisum*	Vegetables	France	United Kingdom	1
Leucinodes orbonalis	*Solanum aethiopicum*	Vegetables	Ghana	Germany	9
	Solanum melongena	Vegetables	India	United Kingdom	1
Leucinodes orbonalis, non-European Tephritidae	*Solanum melongena*	Vegetables	India	Germany	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Liriomyza	*Apium graveolens*	Vegetables	Thailand	Denmark	3
	Apium graveolens	Vegetables	Thailand	United Kingdom	1
	Brassica alboglabra	Vegetables (leaves)	Thailand	Denmark	1
	Dianthus	Cut flowers	Italy	Germany	1
	Ocimum	Vegetables (leaves)	Thailand	Sweden	2
	Ocimum basilicum	Vegetables (leaves)	Israel	Czech Republic	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	United Kingdom	2
Liriomyza huidobrensis	*Aster*	Cut flowers	Zimbabwe	Netherlands	1
	Eryngium	Cut flowers	Kenya	Netherlands	1
	Eustoma	Cut flowers	Kenya	Netherlands	1
	Gypsophila	Cut flowers	Colombia	Netherlands	1
	Gypsophila	Cut flowers	Ecuador	Netherlands	2
	Gypsophila	Cut flowers	Kenya	Netherlands	1
	Gypsophila paniculata	Cut flowers	Kenya	Netherlands	1
	Lisianthus	Cut flowers	Kenya	Netherlands	2
	Molucella	Cut flowers	Israel	Ireland	1
Liriomyza sativae	*Ocimum*	Vegetables (leaves)	Thailand	Sweden	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Czech Republic	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	France	3
	Ocimum basilicum	Vegetables (leaves)	Thailand	Netherlands	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	Sweden	2
	Ocimum basilicum	Vegetables (leaves)	Thailand	United Kingdom	1
	Ocimum canum	Vegetables (leaves)	Thailand	Netherlands	1
Liriomyza sativae, Helicoverpa armigera	*Ocimum*	Vegetables (leaves)	Thailand	Netherlands	1
Liriomyza trifolii	*Apium graveolens*	Vegetables	Thailand*	Denmark	3
	Apium graveolens	Vegetables	Thailand*	Netherlands	2
	Gypsophila	Cut flowers	Israel	Netherlands	7
	Gypsophila	Cut flowers	Kenya	Netherlands	1
	Solidago	Cut flowers	Zimbabwe	Netherlands	1
Liriomyza	*Ocimum basilicum*	Vegetables (leaves)	Thailand	France	1
Maconellicoccus hirsutus, Bemisia tabaci	*Colocasia*	Plants for planting	India	United Kingdom	1
Meloidogyne	*Anubias*	Plants for planting	Taiwan	Germany	1
	Trachycarpus fortunei	Plants for planting	Korea Rep.	United Kingdom	1
Milviscutulus mangiferae	*Cordyline terminalis*	Plants for planting	Singapore	United Kingdom	2
Miridae, Thrips tabaci	*Ocimum basilicum, Rosa*	Vegetables (leaves)	Egypt	Germany	1
Pandeleteius, Zygogramma	*Tillandsia usneoides*	Cuttings	Mexico	Germany	1
Paysandisia archon	*Trachycarpus fortunei*	Plants for planting	Italy	Germany	1
Pepino mosaic virus	*Lycopersicon esculentum*	Seeds	Israel*	United Kingdom	2
	Lycopersicon esculentum	Seeds	USA	United Kingdom	1
	Solanum melongena	Seeds	USA	United Kingdom	1
Phthorimea operculella	*Solanum tuberosum*	Ware potatoes	Egypt	Russia	1
	Solanum tuberosum	Ware potatoes	Israel	Russia	6

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
P. operculella (cont.)	*Solanum tuberosum*	Ware potatoes	Morocco	Russia	1
Phytophthora ramorum	*Rhododendron*	Plants for planting	Austria	Slovenia	1
	Rhododendron	Plants for planting	Germany	Slovenia	1
	Rhododendron	Plants for planting	Poland	Latvia	2
	Rhododendron catawbiense	Cuttings	Netherlands	Finland	1
	Rhododendron yakushimanum	Plants for planting	Netherlands	Ireland	1
	Viburnum bodnantense	Plants for planting	Germany	Slovenia	2
Potato spindle tuber viroid	*Lycopersicon esculentum*	Plants for planting & Seeds	Netherlands	Austria	1
	Petunia	Plants for planting	Germany	Slovenia	2
	Petunia	Cuttings	Israel	Germany	1
	Solanum jasminoides	Plants for planting	Austria	Slovenia	1
	Solanum jasminoides	Plants for planting	Italy	Slovenia	2
	Solanum rantonnetii	Plants for planting	(Germany)	Austria	1
Radopholus similis	*Anubias*	Plants for planting	Thailand	Netherlands	1
	Anubias barteri	Aquarium plants	Singapore	France	4
	Heliconia	Plants for planting	Costa Rica	Netherlands	1
Spodoptera	*Hydrocotyle leucocephala*	Aquarium plants	Croatia	United Kingdom	1
Spodoptera littoralis	*Echeveria*	Cuttings	South Africa	Netherlands	1
	Pelargonium	Cuttings	Spain (Canary Isl.)	Netherlands	1
	Rosa	Cut flowers	Burundi	Netherlands	1
	Rosa	Cut flowers	Uganda	Netherlands	1
Spodoptera litura	*Dendrobium*	Cut flowers	Thailand	Netherlands	1
	Rosa	Cut flowers	India	Netherlands	1
	Various unknown species	Vegetables	Thailand	United Kingdom	1
Thripidae	*Momordica*	Vegetables	Dominican Rep.	United Kingdom	1
	Momordica balsamina	Vegetables	Dominican Rep.	United Kingdom	1
	Momordica charantia	Vegetables	Dominican Rep.	United Kingdom	8
	Momordica charantia	Vegetables	Thailand	United Kingdom	1
	Solanum melongena	Vegetables	Dominican Rep.	United Kingdom	3
	Solanum melongena	Plants for planting	India	United Kingdom	1
	Solanum melongena	Vegetables	India	United Kingdom	2
	Solanum melongena	Vegetables	Thailand	United Kingdom	1
Thrips palmi	*Aranthera*	Cut flowers	Thailand	Netherlands	1
	Capsicum frutescens, Lagenaria siceraria, Momordica charantia, Vigna	Vegetables	Dominican Rep.	Spain	1
	Dendrobium	Cut flowers	Malaysia	Netherlands	1
	Dendrobium	Cut flowers	Thailand	Denmark	2
	Dendrobium	Cut flowers	Thailand	Netherlands	2
	Dendrobium, Vanda	Cut flowers	Thailand	Netherlands	1
	Lagenaria siceraria, Solanum melongena, Vigna	Vegetables	Dominican Rep.	Spain	1
	Momordica	Vegetables	Dominican Rep.	Netherlands	2
	Momordica	Vegetables	Dominican Rep.	United Kingdom	2

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
T. palmi (cont.)	*Momordica*	Vegetables	India	United Kingdom	1
	Momordica charantia	Vegetables	Dominican Rep.	United Kingdom	1
	Momordica charantia	Vegetables	India	United Kingdom	1
	Orchidaceae	Cut flowers	Singapore	Austria	1
	Orchidaceae	Cut flowers	Thailand	Austria	5
	Solanum	Vegetables	Dominican Rep.	Netherlands	2
	Solanum melongena	Vegetables	Dominican Rep.	Netherlands	2
	Solanum melongena	Vegetables	Dominican Rep.	United Kingdom	1
Thrips palmi (suspected)	*Momordica*	Vegetables	Dominican Rep.	United Kingdom	2
	Momordica charantia	Vegetables	Dominican Rep.	United Kingdom	4
	Solanum melongena	Vegetables	Thailand	United Kingdom	2
Thrips palmi, Frankliniella occidentalis	*Limonium*	Cut flowers	China	Russia	1
Thrips tabaci	*Ocimum basilicum, Rosa*	Vegetables (leaves)	Egypt	Germany	1
Tobacco ringspot virus	*Impatiens*	Cuttings	Israel	United Kingdom	2
	Impatiens New Guinea hybrids	Cut flowers	Israel	United Kingdom	1
Tomato spotted wilt virus	*Solanum rantonnetii*	Plants for planting	Denmark	Finland	1
Xanthomonas axonopodis pv. *citri*	*Citrus aurantiifolia*	Fruits	India	United Kingdom	2
Xiphinema rivesi	*Trachycarpus fortunei*	Plants for planting	Spain	United Kingdom	1

- **Fruit flies**

Pest	Consignment	Country of origin	Destination	nb
Anastrepha	*Citrus*	Mexico	United Kingdom	1
	Mangifera indica	Dominican Rep.	United Kingdom	2
	Mangifera indica	Peru	Netherlands	1
Anastrepha obliqua	*Mangifera indica*	Dominican Rep.	United Kingdom	1
Bactrocera	*Annona squamosa*	Thailand	Czech Republic	1
	Annona squamosa	Vietnam	Czech Republic	1
	Mangifera indica	Gambia	United Kingdom	1
	Mangifera indica	India	United Kingdom	1
	Mangifera indica	Pakistan	United Kingdom	3
Bactrocera correcta	*Syzygium samarangense*	Thailand	United Kingdom	1
Bactrocera cucurbitae	*Momordica charantia*	Thailand	France	2
Bactrocera dorsalis	*Annona muricata*	Vietnam	France	1
	Annona squamosa	Thailand	France	1
	Annona squamosa	Vietnam	Czech Republic	2
	Annona squamosa	Vietnam	France	2
	Capsicum frutescens, Mangifera indica	Thailand	France	1
	Mangifera indica	Burkina Faso	France	1

Pest	Consignment	Country of origin	Destination	nb
B. dorsalis (cont.)	*Mangifera indica*	Cameroon	France	1
	Mangifera indica	India	France	1
	Mangifera indica	Pakistan	United Kingdom	3
	Mangifera indica	Thailand	France	9
	Mangifera indica	Vietnam	France	1
Bactrocera kandiensis	*Mangifera indica*	India	United Kingdom	1
Bactrocera latifrons	*Capsicum frutescens*	Thailand	France	12
Bactrocera zonata	*Mangifera indica*	Pakistan	United Kingdom	2
Ceratitis capitata	*Capsicum annuum*	Israel	Russia	1
	Citrus reticulata	Argentina	Russia	2
	Citrus reticulata	Turkey	Russia	2
	Fortunella japonica	(Netherlands)	Russia	1
Ceratitis cosyra	*Mangifera indica*	Burkina Faso	France	1
Non-European Tephritidae	*Mangifera indica*	Dominican Rep.	Netherlands	1
	Mangifera indica	Dominican Rep.	United Kingdom	3
	Mangifera indica	India	United Kingdom	1
	Mangifera indica	Mali	Belgium	1
	Mangifera indica	Mali	Netherlands	1
	Mangifera indica	Pakistan	Netherlands	1
	Mangifera indica	Pakistan	United Kingdom	3
	Syzygium samarangense	Thailand	Netherlands	2

- **Wood**

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Anoplophora glabripennis	Unspecified	Wood packing material	China	Denmark	2
	Unspecified	Wood packing material	China	Germany	1
Anoplophora glabripennis, Apriona germarii	Unspecified	Wood packing material	China	Netherlands	1
Bostrichidae	Unspecified	Wood packing material	India	Germany	1
Cossus	Unspecified	Wood packing material	China	Germany	1
Grub holes > 3 mm	*Larix*	Wood and bark	Russia	Finland	3
	Unspecified	Wood packing material	India	Austria	1
Monochamus	Unspecified	Wood packing material	China	Poland	1
Nematoda	Unspecified	Wood packing material	China	Finland	1
Scolytidae	Unspecified	Wood packing material	China	Germany	1
Sinoxylon	Unspecified	Wood packing material	India	Austria	2
	Unspecified	Wood packing material	India	Germany	2
Sinoxylon indicum	Unspecified	Wood packing material	India	Belgium	1
Sinoxylon senegalense	Unspecified	Wood packing material	Malaysia	Germany	1

- **Bonsais**

Pest	Consignment	Country of origin	Destination	nb
Anoplophora	*Acer*	China	Netherlands	1
Helicotylenchus	*Ficus, Ligustrum, Serissa, Zelkova*	China	Netherlands	2
	Ficus, Ligustrum, Zelkova	China	Netherlands	1
Helicotylenchus	*Ligustrum*	China	Netherlands	1
Rhizoecus hibisci	*Carmona retusa*	China	Netherlands	1
	Serissa	China	Netherlands	1
Xiphinema diffusum	*Podocarpus*	China	Netherlands	1

Source: NPPO of Romania, 2008-10.
EPPO Secretariat, 2008-10.

2008/188 Entry pathways of aquatic weeds in New Zealand

A large number of freshwater aquatic plants have already been introduced into New Zealand. Some of these are now naturalized and cause detrimental impacts. However, there are many more potential weed species reported as present in New Zealand, but not naturalized, and an even greater number of species which if introduced could be a threat to aquatic ecosystems, and the risk they represent needs to be assessed. Known pathways of entry are described below, based on historical accounts and on common knowledge.

Natural spread
Leaving aside human activities, wind-blown seed and migratory birds represent the two most common or likely pathways of entry. These pathways are clearly observed between Australia and New Zealand. Among the Australian aquatic species which have not yet been recorded in New Zealand, there are still a few species that have the potential to be introduced. For example, additional *Typha* species (Typhaceae) may have the potential to enter as wind-blown seed. Migratory birds may feed on the seed capsules of aquatic plants such as *Potamogeton* spp. (Potamogetonaceae) and *Myriophyllum* spp. (Haloragaceae) or may transport seeds in mud on their legs and feet and spread the plants. *Gratiola pedunculata* (Scrophulariaceae) is a recent example of natural introduction.

Ship ballast
Zizania latifolia (Poaceae), *Alternanthera philoxeroides* (Amaranthaceae) and *Schoenoplectus californicus* (Cyperaceae) are suspected to have been introduced through ship ballast. Ballast shipping is now more carefully regulated in New Zealand, and the current risk of new weed species arriving in ballast appears minimal.

Forage plants
Glyceria maxima (Poaceae) and *Paspalum distichum* (Poaceae) were introduced as cattle fodder in wet areas, and have proven problematic. Stringent checks for weediness in new imports of forage species should prevent further imports of new weeds by this means.

Industrial purposes
Phragmites australis (Poaceae) was used for the treatment of wastewater. Industrial use of aquatic plants should be considered a potential risk for the entry of new species and any application for import for this purpose should be considered carefully.

Acclimatisation societies
Elodea canadensis (Hydrocharitaceae) was the first aquatic weed to be introduced into New Zealand. The further risk from new imports by acclimatisation societies is unlikely.

Pre-legislative 'colonisation'
To create a mirror image of Europe, numerous plants were brought into colonial New Zealand. Flowers included lilies, irises and other similar plants which were introduced with contaminants such as *Hydrilla verticillata* (Hydrocharitaceae), or *Chara foetida* (Characeae).

Research purposes
Hydrodictyon reticulatum (Hydrodictyaceae) and *Marsilea hirsuta* (Marsileaceae) have been introduced for teaching purposes. There is a risk that specimens may contain viable seeds that could escape, or that inappropriate practices are implemented with respect to the culture,

containment and subsequent disposal of material. Despite the potential scientific value or justification for importing foreign specimens, research personnel are recognized by Border Control Authorities as a high-risk profession for facilitating the entry of unwanted organisms.

Culinary and medicinal purposes
Rorippa officinale (Brassicaceae) was introduced for culinary purposes by the French in 1840, and became a major weed problem within a few years. *Eutrema wasabi* (Brassicaceae), *Ipomoea aquatica* (Convolvulaceae) and *Eleocharis dulcis* (Cyperaceae) were also introduced for culinary purposes. *Alternanthera philoxeroides* (Amaranthaceae) has recently been found cultivated as a culinary crop by some members of the Sri Lankan and Somalian communities, mistaking the species for the traditional vegetable *A. sessilis*.

Approved importation
Legislation will now require any organism or new genetic variety not already present in New Zealand to undergo a risk assessment to determine its safety and suitability for entry.

Incorrectly identified import
Examples of incorrectly identified plants of the aquarium and pond plant trade in New Zealand include: the now declared pest plant *Gymnocoronis spilanthoides* (Asteraceae) which was distributed as *Hygrophila costata* (Acanthaceae), and *Hydrocotyle leucocephala* (Apiaceae), which is still sold as *Cardamine lyrata* (Brassicaceae).

Contaminants with legal imports
The greatest risk of unwanted contaminants would be from pond plants grown in outdoor facilities or collected from natural water bodies. Seeds or rhizomes of *Nymphoides peltata* (Menyanthaceae) are thought to have arrived as contaminants on imported water lily rhizomes.

Contaminated products
Used drainage machinery from overseas and packaging can be contaminated with unwanted seeds, but the risk of aquatic species being transported by this means is low.

Mail order plants
Aquatic plants are known to be dispatched around the world by mail order, and a lot of species are likely to be traded without approval. This applies to the research, business and private sectors. It includes incorporation of seeds into private letters. The Internet provides another venue for accessing mail order companies from around the world.

Pocket plants
'Accidental' (deliberate or genuine) contamination of baggage (e.g. sports equipment used in water) may occur, but it is not possible to prove the intent and to obtain reliable information on the extent of the practice.

Conclusions
Based on enquiries to date, there are only thought to be 2 importers in New Zealand of live aquatic plants and these import plants from Denmark, Singapore and South America. This is due to the small size of the aquatic plant market in New Zealand and the costs of importing plants through legal channels. Additionally, there would appear to be a concern from persons importing plants that the industry must be self-regulating to prevent problematic plants

becoming established within the country, as well as to help avoid further prohibitive restrictions being imposed by regulatory authorities. In this regard, the likelihood of new species entering the country by responsible traders would appear limited. On the other hand, prohibitions are reported to encourage the use of illegal entry pathways. The greatest risk of new species entering New Zealand would appear to be through "pocket plants" for aquatic plants.

Source: Champion PD, Clayton JS (2000) Border control for potential aquatic weeds. Stage 1. Weed risk model. Science for conservation 141. Department of conservation, New Zealand. 48 p.
http://www.doc.govt.nz/upload/documents/science-and-technical/sfc141.pdf

Additional key words: invasive alien plants, aquatic plants

Computer codes: ALRPH, CARLY, CRFFO, ELDCA, ELODU, ETMWA, GLYMA, GYNSP, HYDLE, HYGCO, HYKLE, HYLVE, IPOAC, 1MYPG, NAAOF, NYPPE, 1PTMG, 1TYHG, PASDS, PHRCO, ZIZLA, NZ

2008/189 A weed risk model for aquatic plants in New Zealand

The weed risk assessment model was primarily designed by the Ministry of Agriculture and Forestry (MAF) for ranking terrestrial plants, but a new model for aquatic plants has been developed. Attributes of the plant ecology, biology and weediness are assessed based on observations of their behaviour in New Zealand, and/or information from other countries. These attributes are listed below, and for each, guidance is provided about the different possible answers:

Versatility (ranked from 2 to 10, summing the different variables)
This relates to the tolerance to a range of environmental variables:

- temperature tolerance: scored from 0 to 3, 0 if the plant is killed during winter, 1 if it dies off during winter, 2 if limited by winter temperatures, 3 if frost tolerant
- salinity: 0 or 1, 0 if cannot tolerate saline conditions, 1 if can
- range of habitat: 1 to 3, 1 narrow range, 2 if able to grow from water to wetland or from shallow to deep (>5 m), 3 if able to grow from water to dry land
- water/substrate type: 1 to 2, 1 if restricted to sandy to muddy substrate, or oligotrophic to eutrophic waters, 2 if tolerant of both.
- water clarity: 0 to 1, 1 if not affected by water clarity (i.e. floating or emergent).

Habitat (ranked from 1 to 9, summing the different variables)

- lentic: rivers, streams, drains, irrigation channels: scored from 0 to 3, 0 if absent, 1 if present but not weedy, 2 if minor weed, 3 if major weed
- lotic: ponds, shallow and deep lakes: 0 to 3 as previously
- wetlands: water margins, swamp, marsh, bog: 0 to 3 as previously

Competitive ability (ranked from 0 to 10, summing the different variables)

- within growth form, i.e. submerged, floating, emergent: 0 to 8, 8 for *Hydrylla, Ceratophyllum* and *Egeria*.
- between growth form: 0 to 2, 0 if no interaction, 1 if some suppression, 2 if able to completely displace another growth form.

Propagule dispersal (ranked from 0 to 10, summing the different variables)

- dispersal outside catchment by natural agents, e.g. birds, wind dispersal: 0 to 5, 1 if propagule could be spread in bird crop, 5 if propagule is well adapted to bird/wind dispersal
- dispersal outside catchment by accidental human activity, e.g. drainage machinery, boat trailers, nets: 0 to 3, 3 if spread by the 3 methods
- dispersal outside catchment by deliberate introduction: 0 to 1, 1 if attractive to humans (ornamental fishpond or aquarium)
- effective spread within water body/catchment: 0 to 1, 1 if effective spread within water body by seed or plant fragments

Maturation (ranked from 1 to 3, summing the different variables)
Includes growth rate and time to maturity under ideal conditions.

Seeding ability (ranked from 0 to 5, summing the different variables)

- quantity: 0 to 3, 0 if nil, 1 if <100 seeds/plants, 2 if 100-1000, 3 if >1000
- viability, persistence: 0 to 2, 1 if low viability, 2 if high viability for several years

Cloning ability (ranked from 0 to 5, summing the different variables)
0 if no vegetative spread, 1 for clump forming, 3 for rhizome/stolons, 5 for far-reaching rhizomes/stolons/fragmentation capable of forming new colonies.

Obstruction (ranked from 0 to 10, summing the different variables)

- physical – water use (recreation): 0 to 2, 1 for minor nuisance, 2 for major nuisance
- physical – access: 0 to 2, as previously
- physical – water flow, power generation: 0 to 2, as previously
- physical – irrigation, flood control: 0 to 2, as previously
- aesthetic: 0 to 2, 1 for either a visual or a smell problem, 2 for both

Damage to natural areas (ranked from 0 to 10, summing the different variables)

- reduce biodiversity: 0 to 5, 5 for monospecific stands, reducing score for lessening impact
- reduce water quality: 0 to 3, 3 for major impacts especially deoxygenation
- negatively affect physical processes: 0 to 2, 2 for major effects on substrate stability, hydrology (flooding)

Other undesirable traits (ranked from 0 to 3, summing the different variables)

- health impairment, e.g. drowning, poisonous, sharp leaf edges, mosquito breeding habitat: 0 to 2, 2 for 2 or more effects
- weed of agriculture: 0 to 1, 1 if it is a weed

Extent of suitable habitat (ranked from 0 to 9, summing the different variables)
Available habitat present in New Zealand scored out of 10, amount of available habitat not occupied scored as a fraction, e.g. *Alternanthera philoxeroides* 4/6 (score 4), *Hydrilla verticillata* 9/10 (score 9)

Resistance to management (ranked from 0 to 10, summing the different variables)

- ease of implementation: 0 to 2, 2 if accessibility to weed is difficult, e.g. dense tall impenetrable growths
- recognition of problem: 0 to 1, 1 if difficult to recognize weed, e.g. submerged species
- scope of control method: 0 to 2, 1 if only one control option, 2 if no control option
- suitability: 0 to 1, 1 if control method not always acceptable, e.g. unregistered herbicide
- effectiveness: 0 to 2, 1 if partial control, 2 if ineffective
- duration of control: 0 to 2, 1 if control for 3 or more months, 2 if no control method

Problem in other countries (ranked from 0 to 5, summing the different variables)
0 if not adventive elsewhere, 1 if adventive but not weedy in tropics, 2 if a tropical weed, 3 if adventive, not weedy in other temperate countries, 4 if only a problem in some temperate countries, 5 if widespread problem weed in other temperate countries

This weed risk model has been tested using aquatic invasive plants in New Zealand. The scores obtained with this aquatic plant model have been compared to the score obtained with the MAF weed risk assessment (initially for terrestrial plants). Each species has been checked against the Global Compendium of Weeds (GCW) in order to indicate its invasive behaviour elsewhere in the world, as well as in Flora Europaea and the DAISIE Database to determine its occurrence and invasiveness within the EPPO region. This later information remains only indicative, and "/" indicates that no further information could be found.

Species	**Origin**	**Type**	**Score model**	**Score MAF**	**GCW***	**Distribution EPPO**
Phragmites australis (Poaceae)	Euro-med	Emergent, present in NZ	74.5	15	W, NW, AW, EW	Widespread
Hydrilla verticillata (Hydrocharitaceae)	Eur., Austr., India, Asia?	Obligate submerged	74	22	W, SW, NW, AW, EW	DE, GB, IE, RU
Zizania latifolia (Poaceae)	Asia	Emergent, present in NZ	68	14	W, EW	GB, LV, RU
Ceratophyllum demersum (Ceratophyllaceae)	Cosmop.	Obligate submerged	67	22	W, SW, NW, AW, EW	Widespread
Eichhornia crassipes (Pontederiaceae) EPPO A2 List	S-Am.	Free-floating	67	22	W, SW, NW, AW, EW	ES, IT, PT
Panicum repens (Poaceae)	Africa, Asia, Eur.	Evaluated for import into NZ	66	9	W, NW, AW, EW	Widespread
Ludwigia peruviana (Onagraceae)	S-Am.	Evaluated for import into NZ	65	13	W, SW, NW, AW, EW	Not recorded
Egeria densa (Hydrocharitaceae) EPPO List of IAP	S-Am.	Obligate submerged	64	23	W, NW, AW, EW	AT, BE, CH, DE, ES, FR, GB, IT, NL, Azores (PT), TR

Species	Origin	Type	Score model	Score MAF	GCW*	Distribution EPPO
Alternanthera philoxeroides (Amaranthaceae) EPPO Alert List	S-Am.	Emergent, present in NZ	63	22	W, SW, NW, AW, EW	FR, IT
Lagarosiphon major (Hydrocharitaceae) EPPO List of IAP	Africa	Obligate submerged	60	23	W, SW, NW, AW, EW	BE, CH, DE, GB, FR, IE, IT
Nymphoides peltata (Menyanthaceae)	Asia, Eur.	Water lily	58	17	W, NW, AW, EW	Widespread, invasive in CH, DK, IE, SE
Cabomba caroliniana (Cabombaceae) EPPO List of IAP	S-Am.	Evaluated for import into NZ	58	16	W, NW, AW, EW	BE, FR, GB, HU, NL
Salvinia molesta (Salviniaceae) EPPO Alert List	S-Am.	Free-floating	57	17.5	W, NW, AW, EW	IT
Myriophyllum aquaticum (Haloragaceae) EPPO List of IAP	S-Am.	Emergent, present in NZ	56.5	17	W, NW, AW, EW	DE, IE
Sagittaria graminea (Alismataceae)	N-Am., S-Am.	Emergent, present in NZ	52	26	W, NW, EW	Not recorded
Vallisneria spp. (Hydrocharitaceae)	Subtrop.	Obligate submerged	51	23	/	
Sagittaria montevidensis (Alismataceae)	N-Am., S-Am.	Emergent, present in NZ	46	25	W, SW, NW, AW, EW	ES
Elodea canadensis (Hydrocharitaceae)	N-Am.	Obligate submerged	46	24	W, SW, NW, AW, EW	Widespread
Nymphoides geminata (Menyanthaceae)	Asia, Australasia	Water lily	46	18	W, EW	/
Pistia stratiotes (Araceae) EPPO Alert List	S-Am.	Free-floating	42	20	W, SW, NW, AW, EW	Canarias (ES)
Regnellidium diphyllum (Marsileaceae)	S-Am.	Evaluated for import into NZ	20	4	W	Not recorded

* Abbreviations for the Global Compendium of Weeds column:
W: weed; SW: sleeper weed; NW: noxious weed; AW: agricultural weed; EW: environmental weed.

It appears that *Zizania latifolia, Ludwigia peruviana, Sagittaria graminea* and *Sagittaria montevidensis* would deserve more attention concerning the risk they represent for the EPPO region.

Source: A Global Compendium of Weeds http://www.hear.org/gcw/alpha_select_gcw.htm
Champion PD, Clayton JS (2000) Border control for potential aquatic weeds. Stage 1. Weed risk model. Science for conservation 141. Department of conservation, New Zealand. 48 p. http://www.doc.govt.nz/upload/documents/science-and-technical/sfc141.pdf

Delivering Invasive Alien Species Inventories for Europe (DAISIE) Database. http://www.europe-aliens.org/

Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM and Webb DA (1964/80) *Flora Europeaea*, Vol 1-5. Cambridge University Press, Cambridge (GB).

Additional key words: invasive alien plants, weed risk assessment

Computer codes: ALRPH, CABCA, CEYDE, EICCR, ELDCA, ELDDE, HYLVE, LGAMA, LUDPV, MYPBR, NYPPE, PANRE, PHRCO, PIIST, RGLDI, SAGGR, SAGMO, SAVMO, 1VAIG, ZIZLA, NZ

2008/190 Invasive alien plants from New Zealand

Increasingly, New Zealand native species are being introduced into other temperate regions of the world, and a significant proportion has already become invasive. Because trade from New Zealand has only occurred over the past 150 years, opportunities for the native species to establish in other biogeographic regions are relatively recent. The major driver for the export of New Zealand native plants is the horticultural industry, which has focused on interesting evergreen forms.

Those plant species native from New Zealand and considered invasive in some parts of the world are listed below. Each species has been checked against the Global Compendium of Weeds (GCW) in order to indicate its invasive behaviour elsewhere in the world, as well as in Flora Europaea and the DAISIE Database to determine its occurrence and invasiveness within the EPPO region. This later information remains only indicative, and "/" indicates that no further information could be found.

Species	Entry pathway	GCW*	Naturalization area	Distribution EPPO
Acaena novae-zelandiae (Rosaceae)	Contaminant	W, NW, EW	Eur., N-Am.	GB, IE
Cardamine corymbosa (Brassicaceae)	Contaminant	W, AW	Australia	GB
Carex albula (Cyperaceae)	Horticulture	W, NW, EW	Australia	/
Carex flagellifera (Cyperaceae)	Horticulture	W, SW, NW	Australia	/
Carex testacea (Cyperaceae)	Horticulture	W, NW, EW	Australia	/
Coprosma repens (Rubiaceae)	Horticulture	W, SW, EW	Australia Eur., N-Am., S-Af.	GB, Madeira (PT)
Coprosma robusta (Rubiaceae)	Horticulture	W, EW	Australia, Eur., N-Am.	/
Cordyline australis (Agavaceae)	Horticulture	W, NW, EW	Pacific	FR, GB, IE
Cortaderia fluvida (= C. richardii) (Poaceae)	Horticulture	W, NW, EW	Australia, Eur., N-Am.	FR, GB
Corynocarpus laevigatus (Corynocarpaceae)	Horticulture	W, EW	N-Am., Australia, Pacific	/
Crassula helmsii (Crassulaceae) EPPO A2 List	Horticulture	W, NW, EW	Eur.	BE, DE, ES, FR, GB, IE, IT, NL
Crassula sieberiana (Crassulaceae)	Horticulture	W	N-Am.	/

Species	Entry pathway	GCW*	Naturalization area	Distribution EPPO
Epilobium billardieranum (Onagraceae)	Horticulture	W, EW	Australia, Eur., N-Am.	/
Epilobium nummularifolium (= E. brunnescens) (Onagraceae)	Horticulture	EW	Eur.	GB, IE
Epilobium komorovianum (Onagraceae)	Horticulture	-	Eur.	GB, SK
Epilobium rotundifolium (Onagraceae)	Horticulture	EW	Australia	/
Hebe barkeri (Scrophulariaceae)	Horticulture	-	Eur.	GB?
Hebe brachysiphon (Scrophulariaceae)	Horticulture	-	Eur.	GB
Hebe dieffenbachii (Scrophulariceae)	Horticulture	-	Eur.	GB
Hebe elliptica (Scrophulariceae)	Horticulture	EW	Australia	FR
Hebe parviflora (Scrophulariceae)	Horticulture	-	Australia	/
Hebe salicifolia (Scrophulariceae)	Horticulture	-	Eur.	GB, IE, Azores (PT)
Hebe speciosa (Scrophulariaceae)	Horticulture	W, EW	Australia, N-Am.	GB?, IE
Hoheria populnea (Malvaceae)	Horticulture	W	N-Am.	GB
Hydrocotyle tripartita (Apiaceae)	?	W	Australia	/
Leptospermum ericoides (Myrtaceae)	Horticulture	W, EW	Pacific	/
Leptospermum scoparium (Myrtaceae)	Horticulture	W, EW	Pacific	GB, Azores, Madeira (PT)
Metrosideros excelsa (Myrtaceae)	Horticulture	W, NW, EW	Australia, S-Af.	Azores, Madeira (PT)
Muehlenbeckia complexa (Polygonaceae)	?	W, EW	Australia	Baleares (ES), FR, GB, IE, PT (incl. Azores, Madeira)
Muehlenbeckia ephedroides (Polygonaceae)	?	-	Australia	/
Myoporum laetum (Myoporaceae)	Horticulture	W, NW, EW	Australia, N-Am.	ES, Corse (FR), PT
Myriophyllum propinquum (Haloragaceae)	?	W, EW	Australia	/
Olearia avicennifolia (Astercaeae)	Horticulture	-	Eur.	/
Olearia traversii (Astercaeae)	Horticulture	-	Eur.	IE
Phormium cookianum (Agavaceae)	Horticulture	-	Eur.	GB
Phormium tenax (Agavaceae)	Horticulture, Fiber industry	W, SW, EW	Australia, N-Am., Pacific	GB, IE, Azores (PT)
Pittosporum crassifolium (Pittosporaceae)	Horticulture	W, AW, EW	Australia	GB
Pittosporum eugenioides (Pittosporaceae)	Horticulture	W, EW	Australia	/
Solanum aviculare (Solanaceae)	Horticulture	W, EW	Australia, Caribbean, N-Am.	/

* Abbreviations for the Global Compendium of Weeds column:

"-": no record of invasiveness; W: weed; SW: sleeper weed; NW: noxious weed; AW: agricultural weed; EW: environmental weed.

Some species are recorded in Europe by Yeates & Williams (2006), while no precise data could be found (e.g. *Olearia avicennifolia)*. On the other hand, some species were not mentioned as present in Europe, while some specific occurrences could be found (e.g. *Cardamine corymbosa*). Additionally, many of the New Zealand species occur in Great Britain, highlighting commercial exchanges between these countries.

Source: A Global Compendium of Weeds. http://www.hear.org/gcw/alpha_select_gcw.htm
Delivering Invasive Alien Species Inventories for Europe (DAISIE) Database. http://www.europe-aliens.org/
Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM and Webb DA (1964/80) *Flora Europeaea*, Vol 1-5. Cambridge University Press, Cambridge (GB).
Yeates GW, Williams PA (2006) Export of Plant and Animal Species from an Insular Biota. *Ecological Studies* **186**, 85-100.

Additional key words: invasive alien plants, records

Computer codes: ACENZ, CCKLA, CDLAU, CDTFU, CPMRE, CPMRO, CRXTE, CSBHE, CSBSI, EPIBI, EPINU, HBEBR, HBEEL, HBEPA, HBESA, HBESP, HOHPO, HYDTR, LEKER, LEKSC, MTDEX, MUECO, MUEEP, MYMLA, MYPPR, OLRAV, OLRTR, PHMCK, PHMTE, PTUCR, PTUEU, SOLAV, NZ

2008/191 10th World Congress on parasitic plants (Kusadasi, TR, 2009-06-08/12)

The International Parasitic Plant Society organizes its 10th World Congress on parasitic plants in Kusadasi (TR) on 2009-06-08/12 on the topic 'Parasitic Plants in a Time of Global Change'. Contribution and participation from researchers, industry, and other interested parties on weedy and non weedy parasitic plants is encouraged. The main topics will include:

- Evolution and phylogeny of parasitic plants
- Parasite biochemistry and physiology (including molecular biology)
- Floral biology
- Ecology and population biology of parasitic species
- Host-parasite communication (germination stimulation, haustorial induction, etc.)
- Host and non-host responses to parasitism
- Parasitic weed management
- Regulation and phytosanitation
- Economics

Source: The International Parasitic Plant Society:
http://www.ippsturkey.com/default.asp?link=home

Additional key words: invasive alien plants, conference

Computer codes: TR