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2008/154 Isolated outbreak of *Diabrotica virgifera virgifera* in Tyrol, Austria

The Austrian NPPO informed the EPPO Secretariat of an isolated outbreak of *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae – EPPO A2 List) in Tyrol (west part of Austria). So far, *D. virgifera virgifera* has only occurred in the eastern part of Austria (Burgenland, Niederösterreich, Steiermark – see EPPO RS 2004/058). In the western part of Austria, during the annual survey, one female was trapped in the municipality of Ebbs Eichelwang (district of Kufstein, Tyrol) in the immediate vicinity of the border post 'Kufstein-Kiefersfelden' between Austria and Germany, on the motorway A12. This motorway is an important east-west connection between Austria and Bayern. It is assumed that the beetle was introduced by a truck as it was caught near a parking place for trucks. Phytosanitary measures have been applied in accordance with EU Directive 2006/565/EC and the German authorities were immediately informed.
The pest status of *Diabrotica virgifera virgifera* in Tyrol (Austria) is officially declared as: **Local outbreak, under eradication.**

Source: NPPO of Austria, 2008-09.

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

2008/155 First record of *Rhagoletis completa* in Austria

The Austrian NPPO informed the EPPO Secretariat of the first outbreak of *Rhagoletis completa* (Diptera: Tephritidae – EU Annexes) in Austria. The pest was detected on a walnut tree (*Juglans regia*) in a private garden, in the municipality of Fritzens (Tyrol). The infested tree was cut down and burned immediately. As there are other walnut trees in the vicinity of the original find, a monitoring programme will be set up by the plant protection service of Tyrol in 2009.
The pest status of *Rhagoletis completa* is officially declared as: **Local outbreak, under observation.**

Source: NPPO of Austria, 2008-09.

Additional key words: new record **Computer codes:** RHAGCO, AT

2008/156 Update on the situation of *Anoplophora chinensis* in Germany

As reported in EPPO RS 2008/115, *Anoplophora chinensis* (Coleoptera: Cerambycidae – EPPO A1 List) has been observed for the first time in Germany in June 2008. The NPPO of Germany explained that these findings cannot be considered as outbreaks because only single findings of recently hatched beetles were made on imported *Acer palmatum* plants. These plants had been purchased by a supermarket chain from a company in the Netherlands which had previously imported them from China. The beetles and the relevant host plants were collected and destroyed. So far, no other findings of the pest have been made in Germany.
The pest status of *Anoplophora chinensis* in Germany is officially declared as: **Absent; public awareness activities and official surveys increased, strengthened import control.**

Source: NPPO of Germany, 2008-07.

Additional key words: detailed record **Computer codes:** ANOLCN, DE

2008/157 Situation of *Anoplophora glabripennis* in the USA: eradication continues

In the USA, *Anoplophora glabripennis* (Coleoptera: Cerambycidae – EPPO A1 List) was first discovered in New York (Brooklyn) in August 1996 (EPPO RS 96/214). In the following years, the pest was detected in other areas of New York (Long Island, Queens, Manhattan, Staten and Prall's Islands) and the nearby state of New Jersey (Hudson, Middlesex, Union Counties). As a result of intensive surveys and strict phytosanitary measures, *A. glabripennis* was officially declared eradicated from Hudson County (New Jersey) in March 2008. In the areas which remain infested, eradication efforts continue and the number of infested trees is diminishing from year to year.

A second outbreak was detected in Chicago (Illinois) in July 1998. From 1998 to 2006, numerous quarantine zones were delimited in the city of Chicago and its neighbourhood (Oz Park, Ravenswood, Kilbourn Park, Loyola, Park Ridge, O'Hare airport, Addison and Summit) and approximately 1,770 trees were removed to eliminate the pest. After four years of negative surveys, *A. glabripennis* was officially declared eradicated from Illinois in March 2008. However, in August 2008, a single adult of *A. glabripennis* was detected in the city of Deerfield (Illinois, 20 km north of the northern boundary of the previously regulated area of Chicago). No infested trees have been identified at Deerfield, so far.

In August 2008, *A. glabripennis* was found in Massachusetts for the first time. Several infested trees were detected in a private garden in Worcester (Worcester County). Surveys will be undertaken to delimit the extent of the infestation in Massachusetts and phytosanitary measures will be applied to prevent any further spread and eradicate the pest.

Finally, it can also be recalled that during the last decade, beetles have occasionally been intercepted in western USA, inside or near warehouses, in California (Hawthorne, Los Angeles, South Gate, and Sacramento) and in Washington (Bellingham and Seattle) but these incursions have not led to the establishment of the pest.

The pest status of *Anoplophora glabripennis* in the USA is officially declared as: **Present, only in some areas and under eradication.**

NOTE: Detailed maps showing quarantine areas are available on the APHIS-PPQ website: http://www.aphis.usda.gov/plant_health/plant_pest_info/asian_lhb/alb_maps.shtml

Source: NAPPO Pest Alert System. Official Pest Reports.
USA (2008-04-23). Asian longhorned beetle (*Anoplophora glabripennis*) eradicated from Illinois – United States. http://www.pestalert.org/oprDetail.cfm?oprID=313
USA (2008-08-14). Asian longhorned beetle, *Anoplophora glabripennis,* confirmed in Worcester County, Massachusetts.
http://www.pestalert.org/oprDetail.cfm?oprID=336

Western Integrated Pest Management Center (US). Regional Pest Alert. Asian longhorned beetle, *Anoplophora glabripennis*.
http://www.wripmc.org/alerts/AsianLonghornBeetle.pdf

Additional key words: detailed record, eradication **Computer codes:** ANOLGL, US

2008/158 New records of *Agrilus planipennis* in Canada and USA

In 2008, new records of *Agrilus planipennis* (Coleoptera: Bupestridae – EPPO A1 List) were made in Canada and the USA. In all cases, phytosanitary measures are taken to contain the pest and to eradicate it whenever possible.

- **Canada**

In Canada *A. planipennis* was first recorded in Ontario in 2002. So far, its presence was confined to the Essex County and the Municipality of Chatham-Kent; and to Lambton, Elgin, Middlesex and Norfolk Counties. In June 2008, the presence of *A. planipennis* was confirmed for the first time in the south of Québec, in the Montérégie region.
In Ontario, *A. planipennis* was also detected for the first time in the following cities:
-Brampton (July 2008, infested trees were located in the Dixie Road and Steeles Avenue area).
- Oakville (August 2008)
- Ottawa (August 2008)
- Vaughan (August 2008, infested trees were located in the Highway 7 and Weston Road area).
The pest status of *Agrilus planipennis* in Canada is officially declared as follows: **Present (only in some areas of Ontario and one area of Quebec) and subject to official control.**

- **USA**

In the USA, *A. planipennis* was first recorded in 2002 in Michigan, and later in the states of Illinois, Indiana, Maryland, Ohio, Pennsylvania, and Virginia. In 2008, its presence was confirmed for the first time in Missouri and Wisconsin. In July 2008, 7 specimens were caught in a trap placed in Wayne County, Missouri. In August 2008, one adult beetle and numerous larvae were collected from ash trees in a private wood lot in the city of Saukville, Ozaukee County, Wisconsin. In the immediate vicinity, 20 to 25 trees displayed signs of infestation by *A. planipennis* (D-shaped exit holes, galleries, dieback). In both states, delimiting surveys are being carried out to determine the distribution of the pest.
The pest status of *Agrilus planipennis* in the USA is officially declared as: **Present in some parts of the United States, but is subject to official control to prevent further spread**.

Source: NAPPO Pest Alert System. Official Pest Reports.

Canada (2008-06-27) Emerald ash borer confirmed in Montérégie, Quebec. http://www.pestalert.org/oprDetail.cfm?oprID=323
Canada (2008-07-16) Update on the emerald ash borer (*Agrilus planipennis*) in Canada – Detection in Brampton, Ontario. http://www.pestalert.org/oprDetail.cfm?oprID=327
Canada (2008-08-07) Update on the emerald ash borer (*Agrilus planipennis*) in Canada – Detection in Oakville and Ottawa, Ontario. http://www.pestalert.org/oprDetail.cfm?oprID=334
Canada (2008-09-03) Update on the emerald ash borer (*Agrilus planipennis*) in Canada – Detection in Vaughan, Ontario. http://www.pestalert.org/oprDetail.cfm?oprID=342

USA (2008-08-14). Emerald ash borer (*Agrilus planipennis*) in Ozaukee County, Wisconsin. http://www.pestalert.org/oprDetail.cfm?oprID=333
USA (2008-08-14). Emerald ash borer (*Agrilus planipennis*) in Wayne County, Missouri – United States. http://www.pestalert.org/oprDetail.cfm?oprID=335

Additional key words: detailed record **Computer codes:** AGRLPL, CA, US

2008/159 Current situation of *Bemisia tabaci* in Finland

In Finland, *Bemisia tabaci* (Homoptera: Aleyrodidae – EPPO A2 List) is reported occasionally on glasshouse crops. The pest is mainly found on poinsettias (*Euphorbia pulcherrima*) where it is introduced via imported plant material. Regular inspections are carried out by the NPPO and it has been observed that the number of findings of *B. tabaci* has increased in the last few years. In 2006-2007, there were 50 findings each year which was clearly more than before. In 2008, *B. tabaci* has already been found in 38 nurseries producing poinsettias. In addition, it has also been detected in poinsettia during market and import inspections. When the pest is detected, it is subject to eradication measures to prevent its permanent establishment in production units.
The situation of *Bemisia tabaci* in Finland can be described as follows: **Transient, occasionally found on glasshouse crops, under eradication.**

Source: EVIRA – Finnish Food Safety Authority (last accessed 2008-09)
Tobacco whitefly found in poinsettia cultivations.
http://www.evira.fi/portal/en/plant_production_and_feeds/current_issues/?id=1357

Additional key words: detailed record **Computer codes:** BEMITA, FI

2008/160 *Diaphorina citri* found in Alabama, California, Georgia, Mississippi and South Carolina (US)

In the USA, *Diaphorina citri* (Homoptera: Psyllidae – EPPO A1 List) was detected for the first time in Florida in June 1998 (EPPO RS 98/159). Subsequently, this vector of citrus huanglongbing was discovered in Texas in 2001 (EPPO RS 2003/033) and in Louisiana in 2008 (EPPO RS 2008/118). In August 2008, the presence of *D. citri* was confirmed in Alabama, Georgia, Mississippi and South Carolina. All insect specimens were collected among residential citrus plants. At present, no psyllids or plants have tested positive for citrus huanglongbing in these four states. In September 2008, *D. citri* was also discovered in California. The insect specimen was collected from a lemon tree in a residential area of San Diego, approximately 18 km north of the border with Mexico.
It can be recalled that huanglongbing (associated with '*Candidatus* Liberibacter asiaticus' – EPPO A1 List) is only known to occur in Florida and that it was recently detected in Louisiana.
The pest status of *Diaphorina citri* in the USA is officially declared as follows: **Present in some areas and subject to official control to limit its spread in the United States.**

Source: NAPPO Pest Alert System.
Official Pest Reports – USA (2008-08-28). Confirmation of Asian citrus psyllid, *Diaphorina citri*, in Alabama, Georgia, Mississippi and North Carolina.
http://www.pestalert.org/oprDetail.cfm?oprID=340

Official Pest Reports – USA (2008-09-04). Confirmation of Asian citrus psyllid in San Diego County, California – United States.
http://www.pestalert.org/oprDetail.cfm?oprID=343

Additional key words: detailed record **Computer codes:** DIAACI, US

2008/161 First report of '*Candidatus* Liberibacter asiaticus' in Cuba

Symptoms resembling those of huanglongbing (greening, mottling and chlorosis) have been observed in citrus-growing areas throughout Cuba. Ten leaf samples were collected from 5 symptomatic and 5 asymptomatic citrus trees and tested for the presence of '*Candidatus* Liberibacter africanum' and '*Ca*. L. asiaticus' (both EPPO A1 List). Molecular tests (PCR, sequencing) revealed the presence of '*Ca*. L. asiaticus'. This is the first report of '*Ca*. Liberibacter asiaticus' associated with huanglongbing in Cuba.
The situation of '*Candidatus* Liberibacter asiaticus' in Cuba can be described as follows: **Present, first detected in 2008 in a small number of samples but symptoms of the disease are widely observed.**

Source: Martínez Y, Llauger R, Batista L, Luis M, Iglesia A, Collazo C, Peña I, Casín JC, Cueto J, Tablada LM (2008) First report of *Candidatus* 'Liberibacter asiaticus' associated with Huanglongbing in Cuba. *New Disease Report*, Volume 18 August 2008 – January 2009. http://www.bspp.org.uk/ndr/jan2009/2008-50.asp

Additional key words: new record **Computer codes:** LIBEAS, CU

2008/162 Eradication of *Ralstonia solanacearum* from Ireland

In Ireland, during the annual survey for *Ralstonia solanacearum* (EPPO A2 List), a water sample from a potato packer was found positive on 2007-09-26. Investigations showed that one potato variety supplied by one grower was at the source of this positive sample. All 120 ha of potato stocks on the growers' farm were tested with 4 fields testing positive. These plots had all been produced from the same 2006 seed lot. All the 2007 seed progeny from this lot was identified leading to the testing of a further 24 growers. As a result of the investigation, it emerged that contamination appeared to originate from 2 contiguous plots cultivated in 2006 that had both been irrigated that year from a nearby river. Water and weed samples taken at the location concerned and upstream have tested negative. As part of the investigation, 1 positive seed potato lot and 1 positive ware potato lot were detected at 2 farms, both were sister lots to the original finding. These places were designated as contaminated. There were 9 other farms that had received sister lots but had tested negative for *R. solanacearum*.
Phytosanitary measures were applied in accordance with EU Directive 98/57/EC to eradicate *R. solanacearum*. Nearly 1000 tonnes of potatoes were designated as contaminated and destroyed (potatoes were lifted and destroyed in the field). 5000 tonnes of potatoes were designated as probably contaminated and were disposed through approved processors for packing to final consumer. These facilities had appropriate water treatment systems and heat-treated all waste potatoes before being used as cattle feed.
All seed potatoes marketed and planted in 2008 were tested and found free from *R. solanacearum*. In addition, all tested samples of surface water were found free of the bacterium. Therefore the NPPO of Ireland considers that eradication has been achieved. Intensive surveys will continue in Ireland.
The pest status of *Ralstonia solanacearum* in Ireland is officially declared as: **Absent, pest eradicated**.

Source: NPPO of Ireland, 2008-09.

Additional key words: eradication **Computer codes:** PSDMSO, IE

2008/163 First record of *Iris yellow spot virus* in Italy

In 2007, during routine surveys carried out in Emilia-Romagna (Italy) on seed crops intended for export, symptoms resembling those of *Iris yellow spot virus* (IYSV - EPPO Alert List) were observed on several onion crops (*Allium cepa*). In the tested samples, three tospoviruses were detected (ELISA) alone or in combination: *Impatiens necrotic spot virus, Tomato spotted wilt virus* (both EPPO A2 List) and *Iris yellow spot virus*. In 2008, further tests were done (RT-PCR, electronic microscopy, herbaceous indicators) and confirmed the presence of IYSV. In Emilia-Romagna, IYSV has been found in the eastern part of the region, in the provinces of Bologna, Ravenna and Forlí-Cesena. Although there had been an earlier record of IYSV in Veneto region, this is the first confirmed report of IYSV in Italy. In 2003, IYSV was detected in the Veneto region by serological tests (without confirmation by molecular tests) in one plant of *Portulaca* (Portulacaceae) originating from another country (Cosmi *et al.*, 2003). But since this isolated record, IYSV has not been found again in the Veneto region. In Emilia-Romagna, high population levels of *Thrips tabaci* (vector of IYSV) were observed in onion seed crops in 2007, but were lower in 2008. Surveys will be carried out to delimit the extent of the infection of IYSV in Emilia-Romagna and possibly in other regions, and recommendations will be made to the growers to control *T. tabaci* more effectively in onion crops.
The situation of *Iris yellow spot virus* in Italy can be described as follows: **Present, first found in 2007 on onion crops (*Allium cepa*) in Emilia-Romagna (provinces of Bologna, Ravenna and Forlí-Cesena).**

Note: a picture showing symptoms of IYSV has kindly been provided by the Regional Plant Protection Service of Emilia-Romagna and can be viewed on the EPPO gallery of pictures.
http://photos.eppo.org/index.php/album/246-iris-yellow-spot-virus-iysv00-

Source: Regional Plant Protection Service, Emilia-Romagna (IT), 2008-08.
Cosmi T, Marchesini E, Martini G (2003) [Presence and spread of Tospovirus and thrip vectors in Veneto.] *Informatore Agrario* **59**(20), 69-72 (abst.).

Additional key words: new record **Computer codes:** IYSV00, IT

2008/164 First record of *Iris yellow spot virus* in Serbia

In July 2007, symptoms resembling those of *Iris yellow spot virus* (*Tospovirus*, IYSV – EPPO Alert List) were observed in one onion (*Allium cepa*) seed crop in Sirig (20 km north of Novi Sad, Vojvodina province) in Serbia. Affected plants presented the characteristic symptoms of chlorotic or necrotic spindle and diamond-shaped lesions on the leaves and scapes. Symptomatic plants were found throughout the field and disease incidence was estimated at 80%. Leaf and scape samples were tested for the presence of IYSV, *Tomato spotted wilt virus* (TSWV) and *Impatiens necrotic spot virus* (INSV) by ELISA. All samples tested negative for TSWV and INSV. IYSV was detected serologically in 26 out of 34 onion samples. The identity of the virus was confirmed by inoculation to herbaceous indicators, RT-PCR and sequencing. Although further studies are needed to determine the distribution and incidence of the disease, this is the first report of IYSV in Serbia.
The situation of *Iris yellow spot virus* in Serbia can be described as follows: **Present, first detected in 2007 in one onion seed crop near Novi Sad (at Sirig).**

Source: Bulajić A., Jović J, Krnjajić S, Petrov M, Djekić I, Krstić B (2008) First report of *Iris yellow spot virus* on onion (*Allium cepa*) in Serbia. *Plant Disease* **92**(8), p 1247.

Additional key words: new record **Computer codes:** IYSV00, RS

2008/165 First report of *Iris yellow spot virus* on onion and shallot in New Zealand

During a disease survey of *Allium* crops in New Zealand in 2007, characteristic diamond-shaped lesions resembling those of *Iris yellow spot virus* (*Tospovirus*, IYSV – EPPO Alert List) were observed on a few onion seed plants (*Allium cepa* cv. Early Long Keeper) in the Blenheim area of the South Island. Laboratory analysis (DAS-ELISA, RT-PCR, sequencing) confirmed the presence of IYSV. In New Zealand, more samples were collected from 28 *Allium* crops (samples of 100 plants per crop) and from 4 ornamental *Allium* species (1 plant for each species: *Allium senescens, A. murrayanum, A. caesium* and *A. moly*). Results showed that IYSV was widespread in onion and shallot crops (*A. cepa*) in both the North and South Islands, but it was not detected in garlic (*A. sativa*). The infected *Allium* crops showed a significant amount of thrips damage, but most plants had no IYSV symptoms. Two of the ornamental *Allium* species (*A. senescens* and *A. murrayanum*), tested positive for IYSV by ELISA but were symptomless. In addition, attempts to amplify the viral genome by RT-PCR for sequencing were unsuccessful. This is the first report of IYSV in onion and shallot but its economic impact on *Allium* crops still needs to be determined in New Zealand.
The situation *of Iris yellow spot virus* in New Zealand can be described as follows: **Present, widespread in *Allium cepa* (onions and shallots) both in North and South Islands, but economic impact needs to be further studied.**

Source: Ward LI, Perez-Egusquiza Z, Fletcher JD, Ochoa Corona FM, Tang JZ, Liefting LW, Martin EJ, Quinn BD, Pappu HR, Clover GRG (2008) First report of *Iris yellow spot virus* on *Allium cepa* in New Zealand. New Disease Reports, Volume 17, February 2008 - July 2008. http://www.bspp.org.uk/ndr/july2008/2008-43.asp

Additional key words: new record **Computer codes:** IYSV00, NZ

2008/166 First record of *Mycosphaerella dearnessii* in the Czech Republic

The NPPO of the Czech Republic recently informed the EPPO Secretariat of the first occurrence of *Mycosphaerella dearnessii* (anamorph *Lecanosticta acicola* – EPPO A2 List) on its territory. In 2007, *M. dearnessii* was detected by Dr L. Jankovsky (Mendel University of Agriculture and Forestry, Brno) on pine trees (*Pinus uncinata* subsp. *uliginosa*) growing in a preserved bog forest located in the South-Bohemian region. Affected trees showed needle blight symptoms including heavy defoliation. The identity of the fungus was confirmed in August 2008 on the basis of morphology and PCR assays. As the disease was found in a National Nature Reserve, no official measures were taken but surveys will continue in this area.
The pest status of *Mycosphaerella dearnessii* in the Czech Republic is officially declared as: **Present, found in one locality.**

Source: NPPO of Czech Republic, 2008-08.

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

2008/167 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 2008/107). Notifications have been sent directly to EPPO by Algeria, Norway, 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 (*).

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Abacetus	*Zingiber officinale*	Vegetables	Thailand	Israel	1
Aleyrodidae	*Brachycome*	Cuttings	Spain	Israel	1
Alphitobius diaperinus	*Eugenia caryophyllus*	Stored products	Indonesia	Israel	1
Ambrosia	*Glycine*	Stored products	USA	Israel	1
	Zea mays	Stored products	USA	Israel	1
Aphelenchoides besseyi	*Oryza sativa*	Seeds	Turkey	Bulgaria	2
Aphelenchoides fragariae	*Oxalis*	Plants for planting	Netherlands	Israel	1
Aphis fabae	*Agapanthus*	Cut flowers	Netherlands	Israel	1
Apidiidae	*Eustoma*	Plants for planting	Netherlands	Israel	1
Ascochyta fabae	*Vicia faba*	Seeds	Spain	Israel	1
Bemisia tabaci	*Colocasia esculenta*	Vegetables	India	United Kingdom	1
	Eryngium foetidum	Vegetables (leaves)	Thailand	France	2
	Eryngium foetidum	Vegetables (leaves)	Thailand	Sweden	1
	Eryngium foetidum	Vegetables (leaves)	Vietnam	France	1
	Eustoma	Cut flowers	Israel	Netherlands	1
	Hibiscus	Plants for planting	Côte d'Ivoire	Belgium	4
	Hypericum	Cut flowers	Zimbabwe	Norway	1
	Hypericum	Cuttings	Zimbabwe	Norway	1
	Lavandula	Cuttings	Israel	United Kingdom	1
	Mandevilla	Plants for planting	Netherlands	Finland	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Netherlands	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	France	1
	Ocimum sanctum	Vegetables (leaves)	Thailand	France	1
	Ocimum sanctum	Vegetables (leaves)	Thailand	United Kingdom	1
	Salvia	Cuttings	Costa Rica	Sweden	2
	Telfairia	Vegetables	Nigeria	Ireland	1
	Unspecified	Aquarium plants	Singapore	Ireland	1
Bemisia tabaci, Spodoptera	Unspecified	Vegetables	Thailand	United Kingdom	1
Bursaphelenchus xylophilus	Unspecified	Packing wood	China	Finland	1
Callosobruchus maculatus	Unspecified	Stored products	Ethiopia	Israel	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Caloglyphus	*Cocos*	Fruits	Côte d'Ivoire	Israel	1
Carabidae	*Musa*	Fruits	Brazil	Spain	1
	Musa	Fruits	Brazil	Spain	1
Carpophilus	*Crocus*	Stored products	India	Israel	1
Celastrus	*Zea mays*	Seeds	Netherlands	Israel	1
Chenopodium	*Anethum graveolens*	Seeds	Denmark	Israel	1
Ciborinia camelliae	*Camellia japonica*	Plants for planting	France	Ireland	1
	Camellia japonica	Plants for planting	Netherlands	Ireland	1
Clavibacter michiganensis subsp. *michiganensis*	*Lycopersicon esculentum*	Seeds	Brazil	France	1
	Lycopersicon esculentum	Seeds	Taiwan	France	1
Clavibacter michiganensis subsp. *sepedonicus* (suspected)	*Solanum tuberosum*	Seed potatoes	France	Bulgaria	1
Corynespora cassiicola (suspected)	*Ocimum basilicum*	Vegetables (leaves)	Thailand	Germany	1
Curculionidae	Unspecified	Stored products	Ethiopia	Israel	1
Cuscuta	*Ocimum basilicum*	Seeds	Italy	Israel	1
Dacne	*Zingiber officinale*	Vegetables	Thailand	Israel	1
Descurainia sophia	*Allium schoenoprasum*	Seeds	Denmark	Israel	1
Drasterius	*Zingiber officinale*	Vegetables	Thailand	Israel	1
Echinochloa	*Anethum graveolens*	Seeds	Denmark	Israel	1
Elsinoe	*Citrus reticulata*	Fruits	Argentina	Spain	2
	Citrus unshiu	Fruits	Uruguay	Spain	1
Erwinia carotovora subsp. *carotovora*	*Dracaena sanderiana*	Cuttings	Taiwan	Israel	1
Erwinia stewartii	*Zea mays*	Seeds	USA	Germany	1
Erwinia stewartii (suspected)	*Zea mays*	Seeds	Chile	Germany	1
Fallopia convolvulus	*Anethum graveolens*	Seeds	Denmark	Israel	1
	Coriandrum sativum	Seeds	Italy	Israel	1
	Hordeum	Stored products	Bulgaria	Israel	1
	Triticum	Stored products	Russia	Israel	3
	Triticum	Stored products	Ukraine	Israel	1
Frankliniella occidentalis	*Schlumbergera*	Pot plants	Netherlands	Israel	1
Fusarium	*Lycopersicon esculentum*	Seeds	China	Israel	1
Fusarium solani	*Wisteria*	Cuttings	Netherlands	Israel	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Galium mollugo	*Eruca sativa*	Seeds	Italy	Israel	1
Geranium dissectum	*Allium schoenoprasum*	Seeds	Denmark	Israel	1
Geranium pusillum	*Allium schoenoprasum*	Seeds	Denmark	Israel	1
Globodera pallida	*Solanum tuberosum*	Ware potatoes	Morocco	France	1
Globodera rostochiensis	*Solanum tuberosum*	Ware potatoes	Italy	Ireland	1
Guignardia citricarpa	*Citrus limon*	Fruits	South Africa	Netherlands	1
Guignardia citricarpa	*Citrus maxima*	Fruits	Vietnam	Netherlands	7
Helicoverpa	*Rosa*	Cut flowers	Zambia	Netherlands	1
Helicoverpa armigera	*Dianthus*	Cut flowers	Egypt	Netherlands	1
	Dianthus	Cut flowers	Kenya	Netherlands	1
	Eryngium	Cut flowers	Zimbabwe	Netherlands	2
	Eustoma	Cut flowers	Israel	Netherlands	1
	Pisum sativum	Vegetables	Kenya	Netherlands	1
	Rosa	Cut flowers	Ethiopia	Netherlands	1
	Rosa	Cut flowers	India	Netherlands	2
	Rosa	Cut flowers	Israel	Netherlands	1
	Rosa	Cut flowers	Kenya	Netherlands	6
	Rosa	Cut flowers	Malawi	Netherlands	1
	Rosa	Cut flowers	Tanzania	Netherlands	2
	Rosa	Cut flowers	Uganda	Netherlands	2
	Rosa	Cut flowers	Zambia	Netherlands	5
	Rosa	Cut flowers	Zimbabwe	Netherlands	26
	Solidago	Cut flowers	Zambia	Netherlands	1
Helicoverpa armigera, Spodoptera littoralis	*Rosa*	Cut flowers	Kenya	Netherlands	1
	Rosa	Cut flowers	Uganda	Netherlands	1
	Rosa	Cut flowers	Zimbabwe	Netherlands	21
Hirschmanniella	*Vallisneria*	Aquarium plants	Thailand	Poland	2
Impatiens necrotic spot virus	*Phalaenopsis*	Plants for planting	Netherlands	Norway	1
Lapsana communis	*Chrysanthemum*	Seeds	Italy	Israel	1
Lasioderma	*Crocus*	Stored products	India	Israel	1
Lasius niger	*Solanum tuberosum*	Ware potatoes	France	Israel	1
Leucinodes orbonalis	*Solanum aethiopicum, Solanum melongena*	Vegetables	Ghana	Germany	1
Leafminers (unspecified)	*Verbena*	Plants for planting	Netherlands	Norway	1
Liriomyza	*Ocimum*	Vegetables (leaves)	Thailand	Sweden	2
	Ocimum basilicum	Vegetables (leaves)	Colombia	Czech Republic	1
	Solidago	Cut flowers	Zimbabwe	Norway	1
Liriomyza huidobrensis	*Eustoma*	Cut flowers	Kenya	Netherlands	2
	Exacum affine	Plants for planting	Denmark	Norway	2

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
L. huidobrensis (cont.)	*Gypsophila*	Cut flowers	Ecuador	Netherlands	3
	Gypsophila	Cut flowers	Kenya	Netherlands	1
	Trachelium	Cut flowers	Ecuador	Netherlands	1
Liriomyza sativae	*Ocimum americanum*	Vegetables (leaves)	Thailand	Denmark	2
	Ocimum americanum	Vegetables (leaves)	Thailand	Netherlands	1
	Ocimum basilicum	Vegetables (leaves)	Israel	Netherlands	1
	Ocimum basilicum	Vegetables (leaves)	Thailand	France	3
	Ocimum basilicum	Vegetables (leaves)	Thailand	Netherlands	1
	Ocimum basilicum, Ocimum sanctum	Vegetables (leaves)	Thailand	France	1
	Ocimum sanctum	Vegetables (leaves)	Thailand	France	1
Liriomyza trifolii	*Aster*	Cut flowers	Israel	Netherlands	1
	Chrysanthemum	Cut flowers	Colombia	Netherlands	1
	Chrysanthemum	Cut flowers	Costa Rica	Netherlands	1
	Gypsophila	Cut flowers	Israel	Netherlands	2
	Gypsophila	Cut flowers	Israel	Netherlands	1
Metamasius hemipterus	*Phoenix roebelenii*	Plants for planting	Costa Rica	Belgium	1
Mycetophilidae	*Zingiber officinale*	Vegetables	Thailand	Israel	1
Mycosphaerella dearnessii, Mycosphaerella pini	*Pinus nigra*	Plants for planting	Poland	Estonia	1
Paratylenchus	*Acer palmatum, Ilex, Loropetalum, Phyllostachys, Podocarpus, Rhododendron, Serissa, Trachycarpus excelsa*	Plants for planting	China	Belgium	1
Pepino mosaic virus	*Lycopersicon esculentum*	Seeds	Israel	Poland	1
	Lycopersicon esculentum	Seeds	Israel	Romania	1
Phleum	*Allium schoenoprasum*	Seeds	Denmark	Israel	1
Phoma exigua var. *foveata*	*Solanum tuberosum*	Seed potatoes	United Kingdom	Algeria	1
Phytophthora ramorum	*Rhododendron*	Plants for planting	Austria	Slovenia	1
	Rhododendron	Plants for planting	Belgium	Norway	2
	Rhododendron	Plants for planting	Denmark	Norway	2
	Rhododendron	Plants for planting	France	Norway	3
	Rhododendron	Plants for planting	Germany	Latvia	1
	Rhododendron	Plants for planting	Germany	Norway	3
	Rhododendron	Plants for planting	Germany	Slovenia	8
	Rhododendron	Plants for planting	Netherlands	Estonia	1
	Rhododendron	Plants for planting	Netherlands	Ireland	1
	Rhododendron	Plants for planting	Netherlands	Slovenia	1
	Rhododendron	Plants for planting	Poland	Estonia	1
	Rhododendron	Plants for planting	Poland	Latvia	1
	Rhododendron catawbiense	Plants for planting	Denmark	Norway	1
	Rhododendron catawbiense, R. yakusimanum	Plants for planting	Denmark	Norway	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Picris echioides	*Anethum graveolens*	Seeds	Denmark	Israel	1
Plasmopara obducens	*Impatiens*	Plants for planting	Italy	Slovenia	1
Plum pox virus	*Prunus avium, P. domestica, P. persica, Pyrus communis*	Plants for planting	Turkey	Bulgaria	1
Ponerinae	*Zingiber officinale*	Vegetables	Thailand	Israel	1
Quadraspidiotus perniciosus	*Malus*	Fruits	Greece	Israel	1
Radopholus similis	*Anubias*	Aquarium plants	Thailand	Netherlands	1
	Calathea	Plants for planting	Thailand	Netherlands	1
Sclerotinia sclerotiorum	*Anethum graveolens*	Seeds	Denmark	Israel	1
	Brassica oleracea var. *acephala*	Seeds	Italy	Israel	1
Spodoptera littoralis	*Ocimum basilicum*	Vegetables (leaves)	Israel	Netherlands	1
	Rosa	Cut flowers	Burundi	Netherlands	1
	Rosa	Cut flowers	India	Netherlands	1
	Rosa	Cut flowers	Kenya	Netherlands	1
	Rosa	Cut flowers	Zimbabwe	Netherlands	4
	Solidago	Cut flowers	Zimbabwe	Netherlands	1
Tenebroides mauritanicus	*Coffea*	Stored products	India	Israel	1
Thielaviopsis basicola	*Daucus*	Vegetables	Spain	Israel	1
Thrips palmi	*Capsicum, Momordica charantia, Solanum melongena, Vigna*	Vegetables	Dominican Rep.	Spain	1
	Dendrobium	Cut flowers	Thailand	Netherlands	2
	Momordica	Vegetables	Dominican Rep.	Netherlands	1
	Momordica charantia	Vegetables	Dominican Rep.	Spain	3
	Momordica charantia	Vegetables	Thailand	Netherlands	2
	Momordica charantia, Solanum	Vegetables	Dominican Rep.	Netherlands	1
	Momordica, Vigna	Vegetables	Dominican Rep.	Spain	1
	Orchidaceae	Cut flowers	Thailand	Austria	4
	Solanum melongena	Vegetables	Dominican Rep.	Netherlands	2
	Solanum melongena	Vegetables	Dominican Rep.	Spain	2
	Solanum melongena	Vegetables	Surinam	Netherlands	2
	Solanum melongena	Vegetables	Thailand	France	1
	Vigna	Vegetables	Dominican Rep.	Spain	6
Thrips tabaci	*Schlumbergera*	Pot plants	Netherlands	Israel	1
Tomato ringspot virus	*Malus*	Plants for planting	Italy	Romania	1
Tribolium castaneum	*Crocus*	Stored products	India	Israel	1
Tribolium confusum	*Eugenia caryophyllus*	Stored products	Indonesia	Israel	1
Trichodoridae	*Enkianthus perulatus*	Plants for planting	Japan	Belgium	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Tylenchus	*Syzygium*	Plants for planting	China	United Kingdom	1
Uropodidae	*Brassica oleracea* var. *capitata*	Vegetables	Netherlands	Israel	1
Weed seedlings	*Cocos nucifera*	Growing media (fibers)	Sri Lanka	Israel	1
Xiphinema americanum, Trichodoridae, Criconematidae	*Chamaecyparis obtusa*	Plants for planting	Japan	Belgium	1
Xiphinema americanum, Trichodoridae, Criconematidae	*Enkianthus perulatus*	Plants for planting	Japan	Belgium	1
Xiphinema incognitum	*Ficus*	Plants for planting	China	Netherlands	1

- **Fruit flies**

Pest	Consignment	Country of origin	Destination	nb
Anastrepha	*Mangifera indica*	Peru	France	1
Bactrocera	*Capsicum annuum*	Thailand	France	1
Bactrocera cucurbitae	*Momordica charantia*	Thailand	France	1
Bactrocera cucurbitae, Diaphania indica	*Momordica*	Thailand	Germany	1
Bactrocera dorsalis	*Annona muricata*	Vietnam	France	1
	Annona squamosa	Vietnam	France	1
Bactrocera latifrons	*Capsicum annuum*	Thailand	France	2
	Capsicum annuum, Capsicum frutescens	Thailand	France	2
Non-European Tephritidae	*Psidium*	Thailand	Netherlands	1
	Syzygium	Thailand	Netherlands	1

- **Wood**

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Ampedus pomorum	Unspecified	Wood	Ukraine	Israel	1
Aphodius scrutator	Unspecified	Wood	Ukraine	Israel	1
Bucculatricidae	*Bambusa*	Wood (canes)	China	Israel	1
Camponotus vagus	Unspecified	Wood	Bulgaria	Israel	1
Cryptophagidae	*Bambusa*	Wood (canes)	China	Israel	1

Pest	Consignment	Type of commodity	Country of origin	Destination	nb
Dermestidae	*Bambusa*	Wood (canes)	China	Israel	1
Grub holes > 3 mm	*Larix*	Wood and bark	Russia	Finland	13
Melandrya	Unspecified	Wood	USA	Israel	1
Ostoma ferrugineum	Unspecified	Wood	Ukraine	Israel	1
Platypodidae, Scolytidae	Unspecified	Wood and bark	Congo	Spain	2
	Unspecified	Wood and bark	Equatorial Guinea	Spain	1
	Unspecified	Wood and bark	Gabon	Spain	1
Trichoferus griseus	Unspecified	Dunnage	Unknown	Israel	1
Uleiota planata	Unspecified	Wood	Ukraine	Israel	1

- **Bonsais**

Pest	Consignment	Country of origin	Destination	nb
Helicotylenchus, Meloidogyne, Pratylenchus, Tylenchorhynchus	*Punica granatum, Stewartia monadelpha*	Japan	Belgium	1
Meloidogyne	*Stewartia*	Japan	Belgium	1
	Veitchia merrillii	USA	Netherlands	1
Meloidogyne, Trichodoridae	*Enkianthus perulatus*	Japan	Belgium	1
Pratylenchus	*Acer buergerianum*	Japan	Belgium	1
	Juniperus chinensis	Japan	Belgium	1
	Pinus pentaphylla	Japan	Belgium	1
	Pyracantha	Japan	Belgium	1
	Taxus cuspidata	Japan	Belgium	1
Rhizoecus hibisci	*Serissa*	China	Netherlands	2
Rotylenchus	*Taxus cuspidata*	Japan	Belgium	1
Tylenchorhynchus	*Ilex crenata*	Japan	Belgium	1
Xiphinema americanum	*Ilex crenata*	Japan	Belgium	2
Xiphinema americanum, Meloidogyne, Trichodoridae	*Enkianthus perulatus*	Japan	Belgium	1
Xiphinema americanum, Pratylenchus, Trichodoridae	*Ilex crenata*	Japan	Belgium	1
Xiphinema americanum, Trichodoridae	*Chamaecyparis obtusa*	Japan	Belgium	1

Source: EPPO Secretariat, 2008-08.

2008/168 Plant species threatened by invasive alien species

763 European plant taxa are considered as extinct or close to extinction, of which 75 no longer exist in the wild according to the IUCN global red list and national red lists. The geographical area under study is Pan-European as covered by Flora Europaea, i.e. including the Northern part of the Mediterranean and Black Seas, the Greek islands, Cyprus, Madeira and Canary Islands. These species are mostly endemic or sub-endemic. The highest numbers of extinct or critically endangered taxa are from the following areas: 162 in the Iberian Peninsula (representing 21.2%), 160 in the Balkan Peninsula (21%), 159 in Macaronesian islands (20.8%), and 135 in the Italian Peninsula (17.7%). The rest of Europe only gathers 147 extinct or critically endangered taxa (19.3%). Endemicity in Central and Western Europe is low and limited to coastal areas (cliffs, dunes, estuaries), rocks and lake shores. Although endemic species are found in Scandinavian and Baltic countries, only one has been found to be threatened. This may be due to a very low number of endemic species in northern countries.

The main factors threatening these rare plant species are listed below; it can be noted that they usually act in combination:

- destruction of habitats is identified as the main driver of species decline, representing 53.4% of known causes of extinctions. It includes: agricultural practices (48.5%); infrastructure development and urbanisation (44.4%); as well as other causes such as management of non agricultural areas (8.5%)
- intrinsic factors account for 53.9% of cases, including the extremely restricted range of species, limited reproduction, regeneration and dispersion capacities
- climate change, although difficult to assess, is likely to influence reproduction/regeneration capacity of certain taxa. It is estimated that 73 taxa are at risk from climate change
- invasive alien species, pollutions and other factors are additional drivers of species decline. They are difficult to assess, and often under-estimated.

Of particular interest are the plants recorded as threatened by invasive alien species:

Species	Family	Origin
Andryala crithmifolia	Asteraceae	Madeira (PT)
Apium graveolens subsp. *butronensis*	Apiaceae	ES
Apollonias barbujana subsp. *ceballosi*	Lauraceae	Las Canarias (ES)
Argyranthemum adauctum subsp. *palmensis*	Asteraceae	Las Canarias (ES)
Bencomia brachystachya	Rosaceae	Las Canarias (ES)
Cheirolophus massonianus	Asteraceae	Madeira (PT)
Convolvulus subauriculatus	Convolvulaceae	Las Canarias (ES)
Crambe tamadabensis	Brassicaceae	Las Canarias (ES)
Crambe wildprettii	Brassicaceae	Las Canarias (ES)
Dianthus arenarius subsp. bohemicus	Caryophyllaceae	CZ
Dorycnium broussonetii	Fabaceae	Las Canarias (ES)
Echium acanthocarpum	Boraginaceae	Las Canarias (ES)
Goniolimon italicum	Plumbaginaceae	IT
Helianthemum bystropogophyllum	Cistaceae	Las Canarias (ES)
Helianthemum cirae	Cistaceae	Las Canarias (ES)
Helianthemum juliae	Cistaceae	Las Canarias (ES)
Hypericum coadunatum	Clusiaceae	Las Canarias (ES)
Iberis intermedia subsp. *beugesiaca*	Brassicaceae	FR

Species	Family	Origin
Isoplexis chalcantha	Scrophulariaceae	Las Canarias (ES)
Lotus pyranthus	Fabaceae	Las Canarias (ES)
Myosotis azorica	Boraginaceae	Açores (PT)
Onopordum nogalesii	Asteraceae	Las Canarias (ES)
Sideritis discolor	Lamiaceae	Las Canarias (ES)
Silene nocteolens	Caryophyllaceae	Las Canarias (ES)
Sonchus wildprettii	Asteraceae	Las Canarias (ES)
Sorbus leyana	Rosaceae	GB
Sorbus wilmottiana	Rosaceae	GB
Teucrium heterophyllum subsp. *heterophyllum*	Lamiaceae	Madeira (PT)
Tolpis crassiuscula	Asteraceae	Las Canarias (ES)

Source: Data supplied from the Most Threatened European endemic and sub-endemic Plants Database, Museum National d'Histoire Naturelle/European Topic Centre on Biological Diversity & Conservatoire Botanique National de Brest, 2006.

Buord S, Lesouëf JY (2006) Consolidating knowledge on plant species in need for urgent attention at European level. Centre thématique Européen pour la Protection de la nature et de la Biodiversité. Muséum National d'Histoire Naturelle. European Environmental Agency. 50 p.

Additional key words: invasive alien plants, threats **Computer codes:** CZ, ES, FR, IT, PT, GB

2008/169 A perspective on climate change and invasive alien species

It is not an easy task to predict how climate change will affect biodiversity because of the difficulty to predict species' responses and the complexity of interactions. It is considered that the problem of biological invasions will worsen due to climate change. It is expected that more non indigenous species will cross frontiers because human activities will promote species movement. The alteration of sites and new climatic conditions could favour the reproduction and spread of alien species. Nitrogen deposition, increasing CO_2 concentration in the atmosphere, global warming, changes in fire frequency and precipitation patterns, together with land use modification are likely to play an increasing role in the success of invasive alien species.

Impact of climate change on plants

Climate change could affect the dynamic of plant invasions in two different ways:

- by causing alterations in native ecosystems leading to the establishment and spread of invasive alien plants
- by favouring individual traits of particular IAS

Alterations in native ecosystems

Changes in temperature and increasing disturbance elements such as fires may stress native species, decreasing the resistance of natural communities to invasions. Native communities could be affected through particular species being limited or favoured, or through the alteration of inter-specific relations at all levels. The loss of keystone species or functional groups of plants could profoundly influence the degree of vulnerability of native communities to invasion. Effects of climate change have been projected for the

distribution of 1350 European plant species for the late 21st century. Results show that the worst scenario leads to a mean species loss of 42% and turnover of 63%, thus predicting a profound alteration in communities and ecosystems. Changes in temperature, precipitation, moisture, level of CO_2 and nitrogen deposition could act as factors for the selection of plants, unbalancing ecosystems by changing the dominance equilibrium, and the interactions between species and their environment.

Favouring individual species traits

The response of species to a changing environment will be individualistic, highlighting the importance of producing predictions at species level.

The response of plants to the increased temperatures seems to be mainly phenological compared to those of animal species where range shifts have been clearly detected. However, the spread of shrubs into the tundra has been reported, as well as shifts in the upward tree-limit in Sweden and Russia. Nevertheless, range shifts of plants are slower than animal shifts. A longer growing season could influence species' reproductive capacity (increased seed production and biomass) and higher temperatures could improve plant fertility resulting in increased population sizes. Animal pollinated invasive plants could benefit an increased insect activity due to higher temperatures and longer summer periods, leading to an increase in fruit and seed set. However, increasing asynchrony in insect-plant systems or predator-prey could have the adverse impact. Fewer winter frosts and fluctuations in water levels may cause the expansion of aquatic invasive alien plants.

In experiments, invasive plants grown individually respond positively to high levels of CO_2, but their response changes in the presence of other species. Species using the C3 photosynthetic pathway used CO_2 even more efficiently than species using C4 and CAM pathways. Among plants using C3 pathway, species in symbiosis with nitrogen-fixing microbes respond strongly to elevated CO_2 in both conditions. Separately, C3 plants respond more positively than C4, but species' responses change in mixed C3-C4 communities depending on other factors such as water, nutrient and light availability, temperature, the efficiency of species using resources, making the prediction of which species will be the most favoured difficult.

The combination of rising temperatures and CO_2 that stimulates plant growth and litter accumulation could lead to an increase in fire frequency. Additionally, extreme events such as floods, storms, heat-waves, droughts, acting as disturbance elements, could increase the risk of new invasions.

Impact of climate change on insects

Insects are strongly influenced by climate, especially temperature: life cycle duration, voltinism, population density, size, genetic composition, etc., can vary in response to the change in temperature. The distribution of many species is limited by summer heat availability rather than the lethal effect of extreme temperatures. Therefore, predicted climate changes are expected to take part in the range of expansion/contraction of insects, affecting their phenology and altering their rates of growth and development.

The responses of insects to climate change are expected to be complex and diverse, depending on the life-history of the insect and host plant growth strategy. Generalist feeders, cosmopolitan species, multivoltine species, phenotypical plasticity, etc. might be traits predicting future invasive success. Opportunity for colonization, and dispersal suitability of the habitat and the host community are factors that also play an important role, making predictions of invasive species response to climate change a real challenge.

Insect traits

Diet breadth

Generalist feeders have a higher probability of finding a suitable host plant than those species that are specialist and restricted to one or a small number of host plants. Specialist feeders will have to move and stay on the single host species in order to survive. Cosmopolitan species (species that have a broader host range and species found at more than one latitude) are more likely to find suitable host plants under climate change.

Phenological plasticity

With climate change, springs occur earlier and the growing season is expected to extend. The majority of herbivorous species rely on close synchrony with their host plants to successfully complete their life cycles. Phenological uncoupling will take place when climate change has different impacts on insects and their host plants. This will be unfavourable to herbivore species such as *Lymantria dispar* (Lepidoptera: Lymantriidae) that are tied to a specific window of time. Expansion of the growing season will be beneficial to multivoltine species since they could produce a larger number of generations in an annual cycle.

Lifecycle strategy

Many researchers have predicted that increasing temperatures will lead to increasing winter survival and increasing numbers of generations per year, thus greatly increasing pest pressure. Species may also increase their range. There is evidence of new invasions of migratory insects, such as Lepidoptera in London, as a result of the rising temperatures. Moreover, non diapausing species, frost sensitive species and species able to overwinter in their active stage show an increase of winter survival in warm winters, and are therefore expected to increase their population densities and expand their geographical range.

Dispersal potential

Large scale shifts in the geographical patterns of agricultural and forest production are expected as they adapt to climate change, and additionally, the origin of the respective products plus the way in which they are transported are likely to change. This will allow a whole new collection of potential invaders. In addition, changes in atmospheric circulation patterns could lead to aerially dispersed insects reaching new areas.

Changes in resource/niche availability

The occurrence of intense storms, late frosts and severe drought will increase, and may lead to detrimental effects on native species, providing opportunities for non native species establishment.

Source: Capdevila-Argüelles L, Zilletti B (2008) A perspective on climate change and invasive alien species. Council of Europe. Convention on the conservation of European wildlife and natural habitats. T-PVS/Inf(2008)5. 26 p.

Additional key words: climate change

2008/170 Survival rates in the Czech Republic of introduced plants known as wool aliens

In Brno, Czech Republic, was located a factory processing wool imported mostly from Australia and South America. Its employees used the processing refuse to fertilize their allotments. From 1958 to 1961, Dvořák and Kühn (1966) observed the plants which were growing in these gardens. Their 5 year record constituted a reasonably complete set of species which might have been introduced with wool imports and which were able to germinate under the local Czech conditions. This set of data was revisited by Pyšek in 2005. To obtain a list of species specifically introduced with wool, archeophytes were excluded from the original list, as well as neophytes known not to be associated with wool. 56 species were identified as associated with the wool processing industry in Brno, and were checked against the recent Czech alien flora to estimate their fate, almost 40 years after their introduction.
Of the 56 species, 18 still occur in the Czech Flora and 38 are considered extinct. Most of the 18 species still occurring are casual and have been frequently reintroduced in different places in the Czech Republic, not only through the wool pathway, though it remains typical of these species. Only 3 species naturalized: *Chenopodium pumilio* (Chenopodiaceae), *Panicum capillare* (Poaceae) and *Xanthium spinosum* (Asteraceae). The extinction rate is therefore 77.9%, survival rate is 22.1%, and naturalization rate is 5.4%. These data fit the 'tens rule" predicting that 10% of the species entering a country naturalize, with confidence limits comprised between 5 and 20%. It should nevertheless be kept in mind that the number of species in this study is rather small.
Wool aliens originating from Australia, Africa and South and Central America were over represented in comparison with neophytes from other continents. There is a remarkable under representation of North American species.
Poaceae was the most represented family, constituting 62.5% of wool aliens, while they only represent 7.9% of the neophyte in the flora of Czech Republic. Fabaceae were also well represented (12.5% versus 7%).
The wool alien flora contained 48 annuals (72.7%), 8 perennials (27.3%), and no woody species (i.e. shrubs, trees or climbers). All surviving species were annuals. This can be associated with the habitat in which the species grew, i.e. gardens.
Height and flowering time did not appear to be good indicators of whether the species would survive or not.

Source: Pyšek P (2005) Survival rates in the Czech Republic of introduced plants known as wool aliens. *Biological invasions* **7**: 567-576.

Additional key words: pathway **Computer codes:** CHEPU, PANCA, XANSP, CZ

2008/171 *Eriochloa villosa* in the EPPO region: addition to the EPPO Alert List

Considering the potential of invasiveness and the limited presence of *Eriochloa villosa* in the EPPO region, the Secretariat considered that this species could usefully be added to the EPPO Alert List.

Why: *Eriochloa villosa* (Poaceae) is a tall grass originating from temperate Asia. It is an annual species, but in areas where mature plants are not killed by frost, it may behave as a facultative perennial. Its common name is woolly cupgrass. The plant has been reported to have been introduced as a seed contaminant, and has been discovered during the Fifth National Weed Survey on Arable Land in Hungary in 2007. Within the EPPO region, its

distribution is still limited. The species has been present in the USA in Oregon since the 1940s where it was apparently introduced through ship's ballast. About that time, it was also reported as adventive in Colorado where it probably escaped from forage trials. It appeared in 2000 in Canada: seeds of *E. villosa* were detected in single lots of imported seed of Japanese millet (*Echinochloa crus-galli* var*. frumentacea*). A Pest Risk Analysis has been performed for Canada, concluding that the species represents a medium risk. Because this plant has shown invasive behaviour where it has been introduced elsewhere in the world and is still limited in the EPPO region, it can be considered an emerging invader in Europe.

Geographical distribution
EPPO region: Hungary, Romania, eastern Russian Federation (native).

Asia (native): eastern China, Japan, Mongolia, Korea Democratic People's Republic, Korea Republic, Taiwan.

North America (invasive): Canada (Quebec), USA (Colorado, Illinois, Iowa, Kansas, Minnesota, Mississippi, Missouri, Nebraska, Oregon, Pennsylvania, Wisconsin).

Note: the species is present in 11 States, and is considered an agricultural weed only in Illinois, Iowa, Minnesota and Wisconsin. The species has been present in the USA since the 1940s, and appeared in 2000 in Canada.
The species is recorded in the North-East of France where it is casual. The species is also recorded in Ukraine, but whether it is established or not is unknown.

Morphology
E. villosa is a tall grass which can reach 2 m. Seedlings are relatively robust with wide leaves that are covered with very short (1 mm or less) hairs. Mature plants have simple leaves which are dark green, with very short hairs on both sides. They measure 50-200 mm in length and 3-13 mm in width. Leaves have rough margins, without auricles, and have a small ligule that is a fringe of hairs. Flowers are borne in terminal panicles, with few to many raceme-like branches. Each raceme bears many spikelets in two rows on the lower side. Seeds are oval-elliptic in shape, relatively large, measuring 4.5-5 mm in length and 2-3 mm in width.

Biology and ecology
Seeds are reported to germinate earlier than most other annual grass species. Germination can occur from depths of 5-10 cm. In Iowa, it typically begins to germinate in mid-April to early May and reaches about 90 % emergence within 3-4 weeks. There is a small percentage of further emergences throughout June and July. Growth is rapid, the plants produce stolons early in the season and the extensive branching of stems allow single plants to occupy and disperse seeds over a large area. Multinodal rooting of the plant confers resistance to mechanical control since cutting or breaking the main stem does not kill the flowering branches. In Illinois, densities of 207 plants per m^2 have been reported. Flowering phenology in Canada appears to be similar to that of the Midwestern USA, where flowering starts in mid-July to early August and continues until frost kills the plant. Sexual reproduction is autogamous. In Iowa, it was found that seeds sown in May without competition produced as much as 164 000 seeds per plant, whereas less than 3000 seeds were produced by plants sown in July. Scattering of mature seeds occurs in August and September. Experimental results show emergence from seeds at the soil surface, and to a depth of 15 cm, though optimum emergence is between 1-10 cm. It has been found that when seeds are subjected to a period of moist, cool, winter-like conditions, they germinate more easily afterwards. It utilizes the C4 photosynthetic pathway, conferring it

a competitive advantage over plants utilizing a C3 photosynthetic pathway. The geographical distribution of the species indicates that it is adapted to a wide variety of climatic conditions since it thrives in subtropical and temperate climates.

Habitats

In its native range, *E. villosa* is reported to occupy banks of continental water, riverbanks/canalsides (e.g. moist meadows), road and rail networks and associated land, other artificial surfaces (wastelands, around houses, open grassy places). It occurs also in arable lands (including rice) and permanents crops (e.g. plantations,) as a weed.
In Midwestern USA where it has been introduced, *E. villosa* is present in cultivated fields of maize and soybean of many States. It is well adapted to maize monoculture and maize-soybean rotations. It also invades habitats adjacent to cropped land, such as field edges, hedgerows, terraces and water courses. It also invades road and rail networks and associated land. The species is well adapted to agro-ecosystems in arable lands, and may be a problem additionally in horticultural systems. It might also be able to invade open natural habitats characterized by disturbances (e.g. shore lines), or early succession habitats (e.g. post-fire communities).

Pathways

Seeds will generally fall close to the parent plants. Over long distances, they can be spread as contaminants of vehicles, particularly on farm machinery and possibly on footwear. It is assumed that the species has been introduced voluntarily in the past for trials as forage, and involuntarily with ship ballast and as a seed contaminant. Because *E. villosa* has large seeds (3x5 mm) which are difficult to separate from those of maize and soybean, it is likely that this species can be introduced with such commodities from countries where it occurs (e.g. USA).

Impacts

E. villosa is very difficult to control and causes significant losses in field crops in the USA through competition and increases the cost of weed control. In 1990, it was estimated to infest 7-10% of row crop acreage in Iowa. It can host several species of fungi which are generalist pathogens of grasses (e.g. *Pyricularia* spp., *Thanatephorus cucumeris, Uromyces* spp.). In its native range, the species is reported to be a common and serious weed in rice.

Control

The control of *E. villosa* can be very difficult as it is very prolific and tolerant of many herbicides. *E. villosa* is less susceptible than many other annual grass weeds of soil-applied herbicides, and can also survive exposure to some foliar-applied herbicides. Herbicide control strategies recommended in the USA involve repeated application of pre-emergence herbicides, followed by one or more treatments with a post-emergence foliar product. These multiple applications result in treatment being more costly than treatment of other annual grass weeds. Current management strategies in the Midwest USA recommend sequential herbicide applications combined with sanitation, crop rotation and mechanical control. Sanitation is crucial since most infestations result from contaminated machinery. Crop rotation can assist greatly since *E. villosa* is very difficult to manage in continuous crop. Mechanical control may include rotary hoeing prior to seedling emergence or shallow cultivation when plants are small.

Source: Darbyshire SJ, Wilson CE, Allison K (2003) The biology of invasive alien plants in Canada. 1. *Eriochloa villosa* (Thunb.) Kunth. *Canadian Journal of Plant Science* **83**, 987-999.
Partosfalvi P, Madarász J, Dancza I (2008) Occurrence of *Eriochloa villosa* (Thunb.) Kunth in Hungary. *Növényvédelem* **44**(6), 304.

Wilson CE (2002) Weed Risk Assessment. Woolly cupgrass (*Eriochloa villosa* (Thinb.) Kunth). Canadian Food Inspection Agency. Plant Health Risk Assessment Unit. PHPD request: 2001-42. 33pp.

Additional key words: invasive alien plants, alert list **Computer codes:** ERBVI, HU

2008/172 8th Workshop of the European Weed Research Society: physical and cultural weed control, Zaragoza (ES), 2009-03-09/11

The working group on physical and cultural weed control of the European Weed Research Society will organize its 8th meeting in Zaragoza (ES) on 2009-03-09/11. The aim of the workshop is to create a forum where people involved in research in physical and cultural weed control can exchange results, experiences, and information. The theme of physical and preventive weed control in uncultivated areas will particularly be addressed. The deadline for submitting a contribution is 2008-09-30.

Source: EWRS Website: www.ewrs.org/pwc/2008

Additional key words: Invasive alien plants, workshop **Computer codes:** ES

2008/173 Towards an early warning and information system for invasive alien species in Europe

In order to improve the ability of European states and institutions to respond to the threats posed to biological diversity in the major European ecosystems and marine areas by invasive alien species, the European Environment Agency (EEA) launches a survey aiming at:

- assessing the existing information and mechanisms for risk assessment to respond to new arrivals of unwanted alien species which may threaten biodiversity and impact ecosystems,
- identifying the main limits and constraints to rapid and effective action.

A simple and short questionnaire is therefore available online that can be filled in 15 minutes until the end of October. Information provided will be used as background material to develop a proposal for a European coordinated early warning and information system for invasive alien species threatening biodiversity in Europe.

Source: European Community Biodiversity Clearing House Mechanism - Towards an early warning and information system for invasive alien species in Europe. http://biodiversity-chm.eea.europa.eu/information/towards-early-warning-and-information-system

Additional key words: invasive alien species, early warning