EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION
ORGANISATION EUROPEENNE ET MEDITERRANEENNE
POUR LA PROTECTION DES PLANTES

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Report of a Pest Risk Analysis

This summary presents the main features of a pest risk analysis which has been conducted on the pest, according to EPPO Decision support scheme for quarantine pests.

Pest:	*Fusarium foetens*
PRA area:	EPPO member countries
Assessor:	PRA prepared by the Dutch NPPO (April 2002) and reviewed by the Panel on Phytosanitary Measures (March 2007).
Date:	2007-05-15

STAGE 1: INITIATION

Reason for doing PRA:	*Fusarium foetens* was first found and described as a new species of *Fusarium* (different from *F. begoniae*) attacking *Begonia* x *hiemalis* (Begonia elatior hybrids) in the Netherlands. This species was then reported in USA Germany and United Kingdom. It has recently been reported in Norway in *Begonia* x *cheimantha* (Lorraine begonia). The origin of this new disease is unknown. *F. foetens* was intercepted a few times on traded cuttings and pot plants in Europe, showing that it had the potential to be spread via trade.
Taxonomic position of pest:	*Fungi, Ascomycota, Hypocreales, Hypocreaceae (mitosporic), Fusarium*

STAGE 2: PEST RISK ASSESSMENT

Probability of introduction

Entry

Geographical distribution:	EPPO region: Netherlands (first found in 2000), Germany (first found in 2001, and occasionally since then in Sachsen-Anhalt, Schleswig-Holstein, Nordrhein-Westfalen, Niedersachsen) North America: USA (in 2003 and 2004, it was found on *Begonia* x *hiemalis* in Connecticut).
Major host plants or habitats:	*Fusarium foetens* has mainly been found on cultivars of *Begonia* x *hiemalis*. Incidental findings occurred in *Begonia* x *cheimantha.*
Which pathway(s) is the pest likely to be introduced on:	The major pathway is plant for planting. Soil adhering to plants for planting was considered as an unlikely pathway as usually new growing media is used

	when cuttings are introduced in a production unit. Natural spread was also considered unlikely.

Establishment

Plants or habitats at risk in the PRA area:	Protected cultivation of mainly *Begonia* x *hiemalis* (Begonia elatior hybrids) and to a much lesser extend *Begonia* x *cheimantha* (Lorraine begonia).
Climatic similarity of present distribution with PRA area (or parts thereof):	Outbreaks have been recorded in glasshouses. The origin of the pest is not known. Climatic comparison is difficult.
Aspects of the pest's biology that would favour establishment:	Survival of chlamydospores of *Fusarium* species in greenhouse conditions is likely due to a favourable temperature and moisture regime. It can also establish in water systems used for irrigation purposes.
Characteristics (other than climatic) of the PRA area that would favour establishment:	Begonia is commonly cultivated in the PRA area in green-houses. Recirculation of water used at production places for propagation could favour the establishment of the pest.
Which part of the PRA area is the endangered area:	*Begonia* x *hiemalis* (Begonia elatior hybrids) is cultivated in green-houses in all major ornamental plant producing countries of the EPPO region.

POTENTIAL ECONOMIC CONSEQUENCES

How much economic impact does the pest have in its present distribution:	In nurseries where is was detected, the disease was reported as severe and mortality of plants has been observed. The disease could not be easily controlled. 100 % losses were recorded on Begonia elatior under experimental conditions in glasshouse at the Plant Protection Service. Losses caused by the formae speciales of the closely related fungus *Fusarium oxysporum* are usually high and their control is difficult in practice (it relies on a combination of various methods, such as chemical control disinfection and hygiene measures). Data on economic impact result from few outbreaks and companies producing Begonia are only a few. Nevertheless for these specialised companies economic impact was high.

Describe damage to potential hosts in PRA area:	   Diseased plants showed basal rot, vein yellowing and wilting. Large macroconidial masses formed by the fungus covered the base of collapsing begonias.
How much economic impact would the pest have in the PRA area:	Economic impact has already been recorded in the PRA area. Begonia elatior production is at risk.

CONCLUSIONS OF PEST RISK ASSESSMENT

Summarize the major factors that influence the acceptability of the risk from this pest:	Outbreaks have already been recorded in the EPPO region and economic impact was high in the companies concerned.
Estimate the probability of entry:	The probability of entry is high (it has already entered the EPPO region and is also recorded in the US.
Estimate the probability of establishment:	Establishment potential is high.
Estimate the potential economic impact:	Economic impact potential is considered high, based on observations in outbreak situations in the EPPO region..
Degree of uncertainty	Geographical distribution and origin of the pest. Data is lacking on the host range (Brand & Wienberg, 2005).
OVERALL CONCLUSIONS	**The pest presents a risk for the Begonia production in the EPPO region.**

STAGE 3: PEST RISK MANAGEMENT

IDENTIFICATION OF THE PATHWAYS

Pathways studied in the pest risk management	Plants for planting of *Begonia* x *hiemalis* and *Begonia x cheimantha*
Other pathways identified but not studied	Soil attached to plants Natural spread

IDENTIFICATION OF POSSIBLE MEASURES

Possible measures for pathways

Measures related to consignments:

- Visual inspection of consignments is not reliable, as at an early stage *F. foetens* is difficult to detect
- Testing of consignments is possible but not practical on a systematic basis
- Infestation of the consignment may be prevented by the production of the plants for planting in a certification scheme but this would need to be combined with measures for ensuring exclusion and may be one of the conditions for establishing a place of production freedom (see below).

Measures related to the crop or to places of production:

- Pest-free area
- Pest-free place of production

Other possible measures

In case of outbreaks, measures aiming at eradication should be implemented. This includes the destruction of all potentially infected plants, restriction of movement of plant material. An additional measure for controlling pathways within production places is the prohibition of recirculation of water used at production places for propagation of of *Begonia* x *hiemalis* and *Begonia x cheimantha* unless adequate treatment can be guaranteed.

EVALUATION OF THE MEASURES IDENTIFIED IN RELATION TO THE RISKS PRESENTED BY THE PATHWAYS

Degree of uncertainty

CONCLUSION:

Recommendation for possible measures (type presentation):

Plants for planting of *Begonia* x *hiemalis* and *Begonia x cheimantha* originating in countries where *Fusarium foetens* occurs	PC and, if appropriate, RC Pest-free area for *Fusarium foetens* or Place of production freedom for *Fusarium foetens*.