NAME OF THE ORGANISM: Diaporthe phaseolorum var. sojae (DIAPPS)

GENERAL INFORMATION ON THE PEST

Name as submitted in the project specification (if different to the preferred name):

Pest category:

Fungi **1- Identity of the pest/Level of taxonomic listing:**
Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?

Yes
Is the pest defined at the species level or lower?:

Yes
Can listing of the pest at a taxonomic level higher than species be supported by scientific reasons or can species be identified within the taxonomic rank which are the (main) pests of concern?

* Not relevant: Oil and fibre plants sector

Is it justified that the pest is listed at a taxonomic rank below species level?

Yes
Conclusion:

* Candidate: Oil and fibre plants sector

Justification (if necessary):

Diaporthe phaseolorum and Phomopsis longicolla isolates from soybean were examined using traditional mycological characteristics and molecular methods. Morphological characteristics of the isolates along with the terminal clades of the ITS phylogeny suggest that P. longicolla is an individual species, D. phaseolorum var. caulivora and D. phaseolorum var. meridionalis are varieties of D. phaseolorum, and D. phaseolorum var. sojae is either several varieties of D. phaseolorum or possibly several distinct species (Zhang et al., 1998). **2 – Status in the EU:**

Is this pest already a quarantine pest for the whole EU?

No
Presence in the EU:

Yes
List of countries (EPPO Global Database):

Bulgaria (1993); France (1993); Hungary (1992); Italy (1993); Romania (1992); Spain (1992)
Conclusion:

candidate
Justification (if necessary):

Data of the presence of this pest on the EU territory are available in EPPO Global Database (<https://gd.eppo.int/>).

HOST PLANT N°1: Glycine max (GLXMA) for the Oil and fibre plants sector.

Origin of the listing:

3 - Oil and fibre plants sector: Council Directive 2002/57/EC
Plants for planting:

Seeds **3 - Is the pest already listed in a PM4 standard on the concerned host plant?**

No
Conclusion:

Evaluation continues **4 - Are the listed plants for planting the main\* pathway for the "pest/host/intended use" combination? (\*: significant compared to others):**

Yes
Conclusion:

Candidate

Justification:

This is a known seed-borne disease in the literature. In Austria, D. phaseolorum var. sojae and D. phaseolorum var. caulivora (now known as D caulivora) were found and seed certification showed a significant influence of year and production area on infection rates of Diaporthe spp. There was a significant but very low correlation between infected soybean seeds and germination (Weingast & Weinhappel, 2015). Diaporthe phaseolorum (not specified to var.) has been found at levels of >30% in 8.5% of the seed samples analysed in Italy (Zecchinelli & Gaudenzi, 2002). In Iowa, USA, field emergence was shown to decline with increasing seed infection and sowing dates for both DP vars and P. longicola (Zorilla et al., 1994). Pedersen & Grau, 2010, found small differences in disease incidence between rotation sequences and tillage systems in 2000, but in 2001, the incidence of D. phaseolorum var. sojae was greater in no-tillage systems and in rotation sequences with continuous planted soybean. Although references to crop rotation and destruction of plants debris are made in various references on control methods, the proportion of field infection from infected debris compared to seed infection is not known. The SEWG concluded that other sources of inoculum may also be important but can be controlled through crop rotation. **5 - Economic impact:**
Are there documented reports of any economic impact on the host?

Yes
Justification:

D. phaseolorum var. sojae produces light-brown spots on the cotyledons and lower stem. Pod and stem blight later appear as pycnidia on the main stem, and broken upper and lower branches, petioles, leaves and pods after maturity (Athow and Laviolette, 1973; Dimitrijevic and Jurkovic, 1982). The most important aspect of pod and stem blight is its effect on seed. Infected seeds may exhibit varying degrees of cracking on the seed coat and shrivelling, and are frequently covered with white mould (Athow and Laviolette, 1973). Sometimes the seeds have brown or black spots on the seed coat (Ilyas et al., 1975). Seeds infected with D. phaseolorum var. sojae are frequently flattened, wrinkled, discoloured and smaller than non-infected seeds (Ellis et al., 1974a). Pedersen & Grau, 2010, concluded that D. phaseolorum var. sojae is a pathogen of subterranean basal stems and causes seed yield loss in soybean. In Canada, seed treatments were found to increase plant emergence and yield in a mixed population of Phomopsis longicolla (41% of isolates), D. phaseolorum var. caulivora (37%) and D. phaseolorum var. sojae (22%) (Xue et al., 2007). It was found that foliar fungicides are beneficial in reducing lodging, seed germination and for increasing yield due to infection by D. phaseolorum var. sojae (Chin MoonSup et al., 1994, Ploper et al., 2000, Vratarić et al., 2002).
What is the likely economic impact of the pest irrespective of its infestation source in the absence of phytosanitary measures? (= official measures)

Medium
Is the economic impact due to the presence of the pest on the named host plant for planting, acceptable to the propagation and end user sectors concerned?

No
Conclusion:

Candidate
Justification:

Pod and stem blight is caused by the fungus Diaporthe phaseolorum var. sojae. The imperfect (conidial) stage is Phomopsis phaseoli.This fungus along with other species of Diaporthe and Phomopsis causes significant yield loss and is commonly associated with low quality, poor germinating seed (Kucharek, 1981). **6 - Are there feasible and effective measures available to prevent the presence of the pest on the plants for planting at an incidence above a certain threshold (including zero) to avoid an unacceptable economic impact as regards the relevant host plants?**

Yes

Conclusion:

candidate
Justification:

The diseases caused by the Diaporthe/Phomopsis complex can be partially controlled by cultural practices such as clean tillage and crop rotation with non-host crops. Knowledge of the inoculum sources is basic for these control strategies (Athow, 1987).
In Brazil, the incidence of D. phaseolorum var. sojae on seeds increased with delayed harvesting (Dhingra et al., 1979a). Heavy rainfalls during August in central Illinois, USA, favoured an epidemic of soyabean pod and stem blight. Even under these severe weather conditions, the quality of seeds harvested from the upper portions of soyabean plants was not reduced. Selective harvest would therefore be feasible and may avoid seed quality losses (Hepperly and Sinclair, 1980a).
Delayed planting decreased infection by D. phaseolorum var. sojae and increased germination rates. Late season cultivars showed less infection and greater germination of seeds than early season cultivars. As plant density increased, infection by D. phaseolorum var. sojae increased and germination decreased. Seeds treated with benomyl germinated better at 15°C than at 25°C. An increased level of N induced greater infection by D. phaseolorum var. sojae and lower germination. A delay in harvest caused a reduction of seed germination and increased the occurrence of abnormal germination and seed decay. This trend was more conspicuous in seeds from soyabean plants that had not been treated with benomyl than in those that had been sprayed with the fungicide (Chin et al., 1993a). Infection of seed by D. phaseolorum var. sojae, Glomerella glycines and Fusarium spp. was lowest, and germination percentages highest, on late-maturing cultivars that were harvested early (Alexander and Hinson, 1973). However, the physiological quality and health of seeds were decreased in Goias, Brazil, by early sowing due to adverse moisture conditions, mechanical damage at harvesting and fungal infection, mainly by D. phaseolorum var. sojae (Pereira et al., 2000).
Field sanitation, including the removal of host debris, fallen petioles and cotyledons from the field, reduced the infection of pods and seeds by Phomopsis spp.; however, seed infection was 28.7% in the sanitized field. Fields sanitized by the application of benomyl around the soyabean plant decreased seed infection by Phomopsis spp. Total seed infection caused by various pathogens was 75-79% without benomyl application compared to 34-42% with a routine fungicide application schedule. Field sanitation was effective in controlling Phomopsis seed decay when infection pressure was low. However, it did not significantly increase the yield of soyabean, whereas a routine fungicide application schedule did (Oh Jeung Haing, 1998). **7- Is the quality of the data sufficient to recommend the pest to be listed as a RNQP?**

Yes

Conclusion:

Candidate
Justification:

 **CONCLUSION ON THE STATUS:**

Recommended for listing as an RNQP, based on data. Risk management measures are proposed for the Phomopsis complex and will indirectly cover D. phaseolorum var. meridionalis. **8 - Tolerance level:**
Is there a need to change the Tolerance level:

Yes
Proposed Tolerance levels:

Basic and certified material:
(a) Seed treatment authorised for use against Diaporthe phaseolorum var. sojae has been applied;
or
(b) Not more than 15% of seed affected with the Phomopsis complex based on laboratory test of a representative sample. **9 - Risk management measures:**
Is there a need to change the Risk management measure:

No
Proposed Risk management measure:

Measures do not need to be specified for non-treated seeds (see defined threshold). **REFERENCES:**

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