NAME OF THE ORGANISM: Diaporthe caulivora (Diaporthe phaseolorum var.
caulivora) (DIAPPC)

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?

Not relevant
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 (1992); Italy (1993)
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, often referred to under its earlier previous name of Diaporthe phaseolorum var. caulivora, although papers often do not separate the effects of different vars. In Austria D. phaseolorum var. sojae and D. phaseolorum var. 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). In Alabama, USA a vigour index (percentage germination × hypocotyl length) was negatively correlated with infection by Diaporthe phaseolorum var. caulivora (Omer et al., 1987) and in Iowa field emergence was shown to decline with increasing seed infection at all sites and sowing dates for both vars and Phomopsis longicola (Zorilla et al., 1994). Although references to crop rotation and destruction of plants debris are made in various references on control methods, the proportion of infected debris from previous field infections 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:

Stem canker caused major crop losses in the north-central region of the USA in the 1950s, with up to 80% of plants infected and yield reductions of 50% in individual fields. The epidemic was attributed to the widespread use of two highly susceptible cultivars, Hawkeye and Blackhawk (Athow, 1987). The disease declined in importance with reduced plantings of these cultivars (Kulik, 1983), and has remained as a minor problem in the region. In 1987-88, less than 5% of plants were infected in experimental field plots in Minnesota (Whiting and Crookston, 1993).
A significant epidemic of stem canker broke out in Europe in the 1980s (Vidic and Jasnic, 1988). Yield was reduced by 50-62% when stem canker infection by the fungus occurred early, with premature wilting and desiccation of the plants. Yield was reduced by 9-20% in plants that were less infected, with spots on the stalk. Yield reductions were dependent on the cultivar; late maturing cultivars were more susceptible than early maturing ones. A highly significant negative correlation was found between yield and severity of infection (R = -6.697), and between 1000-grain weight and degree of infection (R = -0.565) (Vidic and Jasnic, 1988). In a study of European isolates of D. phaseolorum var. caulivora, seedlings of soyabean varieties Mandarin, Harosoy and Tracy-M and the line J 77-339 were inoculated with five isolates collected in different areas of Vojvodina, Serbia. The reaction of Tracy-M soyabean indicated that the isolates were similar to the Northern race, but different from the southern race. A study of Italian isolates of D. phaseolorum var. caulivora reached the same conclusion (DC McGee, Iowa State University, USA, personal communication, 1996).
In 2001 to 2002 growing season, stem canker disease caused by Diaporthe phaseolorum var. caulivora incidence in fields in three localities in Argentina was 10-60, 5-15, and 10-20% (Pioli et al., 2002). The isolates were classified as D. phaseolorum var. caulivora on the basis of morphological analysis and pathogenicity tests on cultivars Tracy M, Crockett, Hutchenson and RA 702 (Pioli et al., 2002).
Soyabean disease loss estimates were also calculated for the 1994 harvested crop from the 10 countries with the greatest soyabean production (Argentina, Bolivia, Brazil, Canada, China, India, Indonesia, Italy, Paraguay and the USA): total yield losses from stem canker (given as being caused by Diaporthe phaseolorum var. caulivora) were a 1,946,200 T reduction with a 3000 T reduction in Italy. Total yield losses due to the Diaporthe–Phomopsis complex were 186,000T, with 1000T reduction in Italy (Wrather et al., 1997).
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:

Yield was reduced by 50-62% when stem canker infection by the fungus occurred early, with premature wilting and desiccation of the plants. In plants having less infection, with spots on the stalk, yield was reduced by 9-20%, depending on the cultivar. Late maturing cultivars were more susceptible than early ones. A highly significant negative correlation was found between yield and severity of infection (R= -6.697), and between 1000-grain wt and degree of infection (R=-0.565). Protein and oil synthesis in the beans were not affected by stem canker (Vidić and Jasnić, 1988). **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:

Crop rotation, deep ploughing and seed disinfection are recommended for control of stem canker in the Caucasus region, Russia (Skripka and Podkina, 1990).
The extent to which a soybean-maize rotation is able to limit the build-up of host-specific pathogens of soybean and the involvement of plant diseases in the rotation effect was investigated. The incidence and severity of seven diseases and seed yield were recorded at two field locations in Minnesota, USA, in 1987 and 1988. Stem canker, caused by D. phaseolorum var. caulivora, was noted in 1987 at both locations in less than 5% of all plants monitored. It was concluded that, within the conditions of the study, the yield benefit to soybean from rotation with maize did not appear to be due to the reduced incidence of plant diseases (Whiting and Crookston, 1993).
In the Korea Republic, the effect of field sanitation was investigated for controlling Phomopsis seed decay in soybean. Field sanitation included removing host debris, petioles and cotyledons from the field. It markedly reduced infection of pods and seeds by Phomopsis sp. However, seed infection was 28.7% in the sanitised field. This control strategy was effective in controlling Phomopsis seed decay when infection pressure was low. D. phaseolorum var. sojae, D. phaseolorum var. caulivora and Phomopsis longicolla were mostly identified from soybean seeds. Colletotrichum truncatum and Cercospora kikuchiana were also isolated. Field sanitation did not significantly increase soybean yield but a routine application schedule did (Oh JeungHaing, 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 caulivora has been applied;
or
(b) Not more than 15% of seed infected 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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