SCIENTIFIC OPINION

Scientific Opinion on the pest categorisation of *Diaporthe vaccinii* Shear[1]

EFSA Panel on Plant Health (PLH)[2,3]

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ABSTRACT

The European Commission requested the EFSA Panel on Plant Health to perform a pest categorisation of *Diaporthe vaccinii* Shear, the fungal agent responsible for twig blight, canker, viscid rot, fruit rot and storage rot of several *Vaccinium* species. The pest is listed in Annex IIAI of Directive 2000/29EC. *D. vaccinii* is a single taxonomic entity and methods exist for its discriminative detection. The host is restricted to *Vaccinium* species, the main cultivated hosts being blueberries and cranberries. Hosts are cultivated throughout Europe, and wild *Vaccinium* species are common components of forests. Conditions are conducive to disease development in most areas of Europe, but not in all Member States (MSs). The disease is currently present in Latvia with restricted distribution and the pest is under surveillance in The Netherlands. In the one Latvian report, storage losses were observed on cranberry, but these losses were caused by a complex of pathogens, including *D. vaccinii*, which was isolated with a low incidence. Detection methods are available but cultural and morphological identifications should be confirmed with molecular tools owing to the presence of other *Phomopsis* species on *Vaccinium* in Europe. The pathogen can spread via the movement of (asymptomatic) infected or contaminated host plants for planting. No information exists on any methods applied for the control of *D. vaccinii* in the EU. *D. vaccinii* does not have the potential to be a quarantine pest as it does not fulfil one of the pest categorisation criteria defined in International Standard for Phytosanitary Measures No 11, that of having a severe impact. Data are not sufficient to conclude on pest categorisation of *D. vaccinii* based on the criteria of the International Standard for Phytosanitary Measures No 21 because there is no information about the level of potential consequences as a result of the use of infected host plants for planting.

KEY WORDS

biology, distribution, consequences, *Phomopsis vaccinii*, *Vaccinium* spp., canker and dieback, Phomopsis twig blight

[1] On request from the European Commission, Question No EFSA-Q-2014-00263, adopted on 02 July 2014.

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BACKGROUND AS PROVIDED BY THE EUROPEAN COMMISSION

The current European Union plant health regime is established by Council Directive 2000/29/EC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community (OJ L 169, 10.7.2000, p. 1).
The Directive lays down, amongst others, the technical phytosanitary provisions to be met by plants and plant products and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union, the list of harmful organisms whose introduction into or spread within the Union is prohibited and the control measures to be carried out at the outer border of the Union on arrival of plants and plant products.

The Commission is currently carrying out a revision of the regulatory status of organisms listed in the Annexes of Directive 2000/29/EC. This revision targets mainly organisms which are already locally present in the EU territory and that in many cases are regulated in the EU since a long time. Therefore it is considered to be appropriate to evaluate whether these organisms still deserve to remain regulated under Council Directive 2000/29/EC, or whether, if appropriate, they should be regulated in the context of the marketing of plant propagation material, or be deregulated. The revision of the regulatory status of these organisms is also in line with the outcome of the recent evaluation of the EU Plant Health Regime, which called for a modernisation of the system through more focus on prevention and better risk targeting (prioritisation).

In order to carry out this evaluation, a recent pest risk analysis is needed which takes into account the latest scientific and technical knowledge on these organisms, including data on their agronomic and environmental impact, as well as their present distribution in the EU territory. In this context, EFSA has already been asked to prepare risk assessments for some organisms listed in Annex IIAII. The current request concerns 23 additional organisms listed in Annex II, Part A, Section II as well as five organisms listed in Annex I, Part A, Section I, one listed in Annex I, Part A, Section II and nine organisms listed in Annex II, Part A, Section I of Council Directive 2000/29/EC. The organisms in question are the following:

Organisms listed in Annex II, Part A, Section II:

- *Ditylenchus destructor* Thome
- *Circulifer haematoceps*
- *Circulifer tenellus*
- *Helicoverpa armigera* (Hübner)
- *Radopholus similis* (Cobb) Thome (could be addressed together with the HAI organism *Radopholus citrophilus* Huettel Dickson and Kaplan)
- *Paysandisia archon* (Burmeister)
- *Clavibacter michiganensis* spp. *insidiosus* (McCulloch) Davis *et al.*
- *Erwinia amylovora* (Burr.) Winsl. *et al.* (also listed in Annex IIB)
- *Pseudomonas syringae* pv. *persicae* (Prunier *et al.*) Young *et al.*
- *Xanthomonas campestris* pv. *phaseoli* (Smith) Dye
- *Xanthomonas campestris* pv. *pruni* (Smith) Dye
- *Xylophilus ampelinus* (Panagopoulos) Willems *et al.*
- *Ceratocystis fimbriata* f. sp. *platani* Walter (also listed in Annex IIB)
- *Cryphonectria parasitica* (Murrill) Barr (also listed in Annex IIB)
- *Phoma tracheiphila* (Petri) Kanchaveli and Gikashvili
- *Verticillium albo-atrum* Reinke and Berthold
- *Verticillium dahliae* Klebahn
- Beet leaf curl virus
- Citrus tristeza virus (European isolates) (also listed in Annex IIB)
- Grapevine flavescence dorée MLO (also listed in Annex IIB)
- Potato stolbur mycoplasma

- *Spiroplasma citri* Saglio *et al.*
- Tomato yellow leaf curl virus

Organisms listed in Annex I, Part A, Section I:

- *Rhagoletis cingulata* (Loew)
- *Rhagoletis ribicola* Doane
- Strawberry vein banding virus
- Strawberry latent C virus
- Elm phloem necrosis mycoplasm

Organisms listed in Annex I, Part A, Section II:

- *Spodoptera littoralis* (Boisd.)

Organisms listed in Annex II, Part A, Section I:

- *Aculops fuchsiae* Keifer
- *Aonidiella citrina* Coquillet
- Prunus necrotic ringspot virus
- Cherry leafroll virus
- *Radopholus citrophilus* Huettel Dickson and Kaplan (could be addressed together with IIAII organism *Radopholus similis* (Cobb) Thome)
- *Scirtothrips dorsalis* Hendel
- *Atropellis* spp.
- *Eotetranychus lewisi* McGregor
- *Diaporthe vaccinii* Shaer.

TERMS OF REFERENCE AS PROVIDED BY THE EUROPEAN COMMISSION

EFSA is requested, pursuant to Article 29(1) and Article 22(5) of Regulation (EC) No 178/2002, to provide a pest risk assessment of *Ditylenchus destructor* Thome, *Circulifer haematoceps, Circulifer tenellus, Helicoverpa armigera* (Hübner), *Radopholus similis* (Cobb) Thome, *Paysandisia archon* (Burmeister), *Clavibacter michiganensis* spp. *insidiosus* (McCulloch) Davis *et al, Erwinia amylovora* (Burr.) Winsl. *et al, Pseudomonas syringae pv. persicae* (Prunier *et al)* Young *et al. Xanthomonas campestris* pv. *phaseoli* (Smith) Dye, *Xanthomonas campestris* pv. *pruni* (Smith) Dye, *Xyîophilus ampelinus* (Panagopoulos) Willems *et al, Ceratocystis fimbriata* f. sp. *platani* Walter, *Cryphonectria parasitica* (Murrill) Barr, *Phoma tracheiphila* (Petri) Kanchaveli and Gikashvili, *Verticillium alboatrum* Reinke and Berthold, *Verticillium dahliae* Klebahn, Beet leaf curl virus, Citrus tristeza virus (European isolates), Grapevine flavescence dorée MLO, Potato stolbur mycoplasma, *Spiroplasma citri* Saglio *et al*, Tomato yellow leaf curl virus, *Rhagoletis cingulata* (Loew), *Rhagoletis ribicola* Doane, Strawberry vein banding virus, Strawberry latent C virus, Elm phloem necrosis mycoplasma, *Spodoptera littoralis* (Boisd.), *Aculops fuchsiae* Keifer, *Aonidiella citrina* Coquillet, Prunus necrotic ringspot virus, Cherry leafroll virus, *Radopholus citrophilus* Huettel Dickson and Kaplan (to address with the IIAII *Radopholus similis* (Cobb) Thome), *Scirtothrips dorsalis* Hendel, *Atropellis* spp., *Eotetranychus lewisi* McGregor *md Diaporthe vaccinii* Shaer., for the EU territory.

In line with the experience gained with the previous two batches of pest risk assessments of organisms listed in Annex II, Part A, Section II, requested to EFSA, and in order to further streamline the preparation of risk assessments for regulated pests, the work should be split in two stages, each with a specific output. EFSA is requested to prepare and deliver first a pest categorisation for each of these 38 regulated pests (step 1). Upon receipt and analysis of this output, the Commission will inform EFSA for which organisms it is necessary to complete the pest risk assessment, to identify risk reduction options and to provide an assessment of the effectiveness of current EU phytosanitary requirements (step 2). *Clavibacter michiganensis* spp. *michiganensis* (Smith) Davis *et al.* and *Xanthomonas campestris* pv. *vesicatoria* (Doidge) Dye, from the second batch of risk assessment requests for Annex IIAII organisms requested to EFSA (ARES(2012)880155), could be used as pilot cases for this approach, given that the working group for the preparation of their pest risk assessments has been constituted and it is currently dealing with the step 1 "pest categorisation". This proposed modification of previous request would allow a rapid delivery by EFSA by May 2014 of the first two outputs for step 1 "pest categorisation", that could be used as pilot case for this request and obtain a prompt feedback on its fitness for purpose from the risk manager's point of view.

As indicated in previous requests of risk assessments for regulated pests, in order to target its level of detail to the needs of the risk manager, and thereby to rationalise the resources used for their preparation and to speed up their delivery, for the preparation of the pest categorisations EFSA is requested, in order to define the potential for establishment, spread and impact in the risk assessment area, to concentrate in particular on the analysis of the present distribution of the organism in comparison with the distribution of the main hosts and on the analysis of the observed impacts of the organism in the risk assessment area.

ASSESSMENT

1. Introduction

1.1. Purpose

This document presents a pest categorisation prepared by the EFSA Scientific Panel on Plant Health (hereinafter referred to as the Panel) for the species *Diaporthe vaccinii* Shear (syn. *Phomopsis vaccinii* Shear) in response to a request from the European Commission (EC).

1.2. Scope

This pest categorisation is for *Diaporthe vaccinii* Shear (syn. *Phomopsis vaccinii* Shear). The pest risk assessment (PRA) area is the territory of the European Union (hereinafter referred to as the EU) with 28 Member States (hereinafter referred to as EU MSs), restricted to the area of application of Council Directive 2000/29/EC, which excludes Ceuta and Melilla, the Canary Islands and the French overseas departments.

2. Methodology and data

2.1. Methodology

The Panel performed the pest categorisation for *Diaporthe vaccinii* Shear following guiding principles and steps presented in the EFSA Guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures (ISPM) No 11 (FAO, 2013) and ISPM No 21 (FAO, 2004).

In accordance with the harmonised framework for pest risk assessment in the EU (EFSA PLH Panel, 2010), this work was initiated as result of the review or revision of phytosanitary policies and priorities. As explained in the background of the European Commission request, the objective of this mandate is to provide updated scientific advice to European risk managers to take into consideration when evaluating whether those organisms listed in the Annexes of Council Directive 2000/29/EC deserve to remain regulated under Council Directive 2000/29/EC, or whether they should be regulated in the context of the marketing of plant propagation material, or should be deregulated. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a quarantine pest in accordance with ISPM 11 (FAO, 2013) but also for a regulated non-quarantine pest (RNQP) in accordance with ISPM 21 (FAO, 2004) and includes additional information required as per the specific terms of reference received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

The Table 1 below presents the ISPM 11 (FAO, 2013) and ISPM 21 (FAO, 2004) pest categorisation criteria on which the Panel bases its conclusions. It should be noted that the Panel's conclusions are formulated respecting its remit and particularly with regards to the principle of separation between risk assessment and risk management (EFSA founding regulation[1]); therefore, instead of determining whether the pest is likely to have an unacceptable impact, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, in agreement with EFSA guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010).

Table 1: International Standards for Phytosanitary Measures ISPM 11 (FAO, 2013) and ISPM 21 (FAO, 2004) pest categorisation criteria under evaluation.

Pest categorisation criteria	ISPM 11 for being a potential quarantine pest	ISPM 21 for being a potential regulated non-quarantine pest
Identity of the pest	The identity of the pest should be clearly defined to ensure that the assessment is being performed on a distinct organism, and that biological and other information used in the assessment is relevant to the organism in question. If this is not possible because the causal agent of particular symptoms has not yet been fully identified, then it should have been shown to produce consistent symptoms and to be transmissible	The identity of the pest is clearly defined
Presence (ISPM 11) or absence (ISPM 21) in the PRA area	The pest should be **absent from all or a defined part of the PRA area**	The pest is **present** in the PRA area
Regulatory status	If the pest is present but not widely distributed in the PRA area, it should be under official control or expected to be under official control in the near future	The pest is under official control (or being considered for official control) in the PRA area with respect to the specified plants for planting
Potential for establishment and spread in the PRA area	The PRA area should have ecological/climatic conditions including those in protected conditions suitable for the establishment and spread of the pest and, where relevant, host species (or near relatives), alternate hosts and vectors should be present in the PRA area	–
Association of the pest with the plants for planting and the effect on their intended use	–	Plants for planting are a pathway for introduction and spread of this pest
Potential for consequences (including environmental consequences) in the PRA area	There should be clear indications that the pest is likely to have an unacceptable economic impact (including environmental impact) in the PRA area	–
Indication of impact(s) of the pest on the intended use of the plants for planting	–	The pest may cause severe economic impact on the intended use of the plants for planting
Conclusion	If it has been determined that the pest has the potential to be a quarantine pest, the PRA process should continue. If a pest does not fulfil all of the criteria for a quarantine pest, the PRA process for that pest may stop. In the absence of sufficient information, the uncertainties should be identified and the	If a pest does not fulfil all the criteria for an regulated non-quarantine pest, the PRA process may stop

Pest categorisation criteria	ISPM 11 for being a potential quarantine pest	ISPM 21 for being a potential regulated non-quarantine pest
	PRA process should continue	

In addition, in order to reply to the specific questions listed in the terms of reference, three issues are specifically discussed only for pests already present in the EU: the analysis of the present EU distribution of the organism in comparison with the EU distribution of the main hosts; the analysis of the observed impacts of the organism in the EU; and the pest control and cultural measures currently implemented in the EU.

The Panel will not indicate in its conclusions of the pest categorisation whether the pest risk assessment process should be continued, as it is clearly stated in the terms of reference that, at the end of the pest categorisation, the European Commission will indicate EFSA if further risk assessment work is required for the pest under scrutiny following its analysis of the Panel's scientific opinion.

2.2. Data

2.2.1. Literature search

A literature search on *Diaporthe vaccinii* was conducted at the beginning of the mandate. The search was conducted for the scientific name of the pest together with the most frequently used common names on the ISI Web of Knowledge database. Further references and information were obtained from experts, from citations within the references as well as from grey literature.

2.2.2. Data collection

To complement the information concerning the current situation of the pest provided by the literature and online databases on pest distribution, damage and management, the Panel sent a short questionnaire on the current situation at country level based on the information available in the European and Mediterranean Plant Protection Organization (EPPO) Plant Quarantine Retrieval (PQR) system (PQR) to the National Plant Protection Organisation (NPPO) contacts of all the EU MSs. A summary table on the pest status based on the EPPO PQR and MS replies is presented in Table 2.

Information on the distribution of the main host plants was obtained from the EUROSTAT database.

3. Pest categorisation

3.1. Identity and biology of *Diaporthe vaccinii* Shear

3.1.1. Taxonomy

Name:

Diaporthe vaccinii Shear (Shear et al., 1931).

Synonyms:

Phomopsis vaccinii Shear (Shear et al., 1931)

Taxonomic position:

Eukaryota; Fungi; Ascomycota; Pezizomycotina; Sordariomycetes; Sordariomycetidae; Diaporthales; *Valsaceae*; *Diaporthe*; *Diaporthe vaccinii*

Common names:

The common names used in English-speaking countries are: Phomopsis twig blight of blueberry, Phomopsis canker and dieback, upright dieback, twig blight, viscid rot, fruit rot, storage rot

Wehmeyer (1933) suggested that *D. vaccinii* was morphologically similar to the previously described *D. phaseolorum* (Cooke and Ellis) Saccardo var. *batatis* (Harter and Field) Wehmeyer and *D. phaseolorum* var. *sojae* (Lehman) Wehmeyer. However, Chao and Glawe (1985) concluded, based on host specificity tests and behaviour of isolates on agar media, that *D. vaccinii* is a species distinct from *D. phaseolorum*. Recent molecular phylogenetic studies demonstrated the single identity of *D. vaccinii* (Kacergius and Jovaisiene, 2010; Udayanga et al., 2011; Elfar et al., 2013; Lombard et al., 2014).

3.1.2. Biology of *Diaporthe vaccinii* Shear

D. vaccinii is the cause of stem cankers, twig blight, leafspots and fruit rot of *Vaccinium* spp. (blueberries and cranberries) (Alfieri et al., 1984; Caruso and Ramsdell, 1995; Farr et al., 2002a, b; Polashock and Kramer, 2006; Farr and Rossman, 2012; Tadych et al., 2012). It should be noted that worldwide several species in the genus *Diaporthe*, and their asexual *Phomopsis*-like pycnidial states, are known to cause diseases of *Vaccinium* spp. These diseases include twig blight, stem cankers and fruit rot (Caruso and Ramsdell, 1995; Farr et al., 2002a, b; Polashock and Kramer, 2006; Latorre and Torres, 2011; Tadych et al., 2012; Elfar et al., 2013). So far, there have been only a few reports of *Diaporthe* and *Phomopsis* spp. isolated from *Vaccinium* spp. grown in Europe (Petrak, 1924; Wilcox and Falconer, 1961; Baker, 1972; Teodorescu et al., 1985; Farr et al., 2002b). However, recent molecular phylogenetic studies demonstrated the occurrence of several other *Phomopsis* species associated with disease symptoms on *Vaccinium* spp. in Europe (Lombard et al., 2014).

D. vaccinii overwinters on the previous year's infected dead twigs and possibly on plant debris (twigs, leaves, fruit) lying on the soil surface (Shear et al., 1931; Wilcox, 1939). In the infested areas, the primary inoculum seems to be conidia that are produced in pycnidia of the anamorph *Phomopsis vaccinii*. Pycnidia are found on dead cankered stems and leaf lesions (Wilcox, 1939; Weingartner and Klos, 1975; Parker and Ramsdell, 1977). Although production of ascomata (perithecia) by the pathogen has been induced *in vitro* (Wilcox, 1940), the ascomycetous stage of the pathogen either has not been found under field conditions (Weingartner and Klos, 1975; Parker and Ramsdell, 1977) or has been very rarely observed (Wilcox, 1940).

Under wet or humid conditions in the USA, the conidial ooze is exuded by pycnidia throughout the whole growing period (February to mid-September) and is dispersed by water splash (rain or overhead irrigation) to the newly, elongating succulent host shoots (Parker and Ramsdell, 1977; Milholland, 1982). Spore-trapping studies conducted in USA showed that the greatest number of conidia was trapped from flower bud break (late February to beginning of April) to bloom (end of May) (Parker and Ramsdell, 1977; Milholland, 1982). Conidia numbers decreased during the period June–August and none was trapped towards the end of the growing season (end of August to mid-September), even though there were several rain events during that period (Parker and Ramsdell, 1977; Milholland, 1982). Greenhouse studies conducted in Michigan (USA) showed that pycnidia of the pathogen were developed on symptomatic woody stems of blueberry two to three weeks after inoculation and continued to develop for two to three months, even at temperatures between 27 and 30 °C (Weingartner and Klos, 1975).

In vitro studies have shown that *D. vaccinii* grows well between 4 and 32 °C (Carlson, 1963; Weingartner and Klos, 1975). The optimum temperature for both mycelial growth and conidial germination is 21–24°C (Wilcox, 1939). No mycelial growth was observed at 0 and 32 °C (Parker and Ramsdell, 1977).

The pathogen enters the host tissues mainly through wounds and to a lesser extent directly into the tips of young, succulent shoots. Field studies demonstrated that healthy unwounded blueberry plants were not infected by *D. vaccinii*, even after one month of exposure to natural field inoculum (Parker and

Ramsdell, 1977). Another means of entry of the pathogen into the host vascular tissues is through the open flower buds (Milholland, 1982).

In susceptible blueberry cultivars in North Carolina, USA, blighting of one-year-old woody stems with flower buds is the predominant symptom (Milholland, 1982). Systemic invasion has also been reported. Infected succulent shoots of the current year wilt within four days and become covered with minute lesions. The pathogen is believed to spread through the vascular tissues of the stems downwards towards the base of the plants, progressing at a rate averaging 5.5 cm in two months, killing major stems/branches (Wilcox, 1939; Daykin and Milholland, 1990). On blueberry stems over two years old, *D. vaccinii* causes a brown discoloration of the stem xylem below wilt symptoms (Weingartner and Klos, 1975). If it reaches and encircles the crown, the plant may wilt and die. Long, narrow cankers covered by the bark of the epidermis may appear on the infected stems (Weingartner and Klos, 1975). Pycnidia usually appear underneath the surface of the bark of dead stems (mostly on three- to five-year-old stems) (Weingartner and Klos, 1975; Cline, 2000). Conidia exuded by pycnidia may cause secondary infections throughout the whole growing season. In addition to shoots and stems, *D. vaccinii* has been reported to infect leaves and fruit. Infected leaves show minute lesions, which enlarge to 1 cm with pycnidia appearing within two weeks after infection (Anco and Ellis, 2011). Fruit (particularly of cranberry) are infected at all stages of their development, but infections remain latent until fruit maturity (Milholland and Daykin, 1983). Infected berries become reddish-brown, soft, mushy, often splitting with leakage of juice (viscid rot) at harvest (Milholland and Daykin, 1983). Since 90 % of isolations from twigs and branches of apparently healthy *V. macrocarpon* plants from a bed with a history of high disease incidence in Wisconsin yielded cultures of *D. vaccinii*, it seems likely that the fungus is an endophytic coloniser of *Vaccinium* spp. (Friend and Boone, 1968).

Field studies conducted in Wisconsin (USA) have shown that serious dieback due to *D. vaccinii* infection occurred when rainfall was below average, and temperatures were above the seasonal average, suggesting a correlation between Phomopsis dieback and dry conditions (Friend and Boone, 1968). Similarly, Witcher (1961) reported that dry conditions and poor soil drainage favour outbreaks of Phomopsis twig blight.

3.1.3. Detection and identification of *Diaporthe vaccinii* Shear

Diagnosis of the disease based only on symptoms is not reliable, as (i) symptomless (latent) infections may also occur (Friend and Boone, 1968; Milholland 1982), and (ii) other fungal species have also been reported to cause on *Vaccinium* spp. stem blight symptoms similar to those caused by *D. vaccinii* (e.g. *Botryosphaeria dothidea*, *Godronia cassandrae*, *Colletotrichum* spp., etc.) (Witcher, 1961; Witcher and Clayton, 1963; Weingartner and Klos, 1975). Therefore, reliable detection and identification of the pathogen can only been made by laboratory testing of the affected plant tissues.

A preliminary diagnosis of the disease can be made by direct examination of infected symptomatic stems during the period August–October for the detection of any pycnidia with conidia consistent with those of *P. vaccinii* (OEPP/EPPO, 2009). In the absence of pycnidia, symptomatic plant tissues are incubated in damp chambers to induce the production of fruiting bodies (pycnidia). Alternatively, the pathogen can be isolated on various culture media (e.g. potato dextrose agar, malt extract agar, sweet clover medium, etc.) on which it may produce pycnidia. In the latter case, identification of the pathogen can be made based on the growth characteristics of its colonies on agar media and the morphological characteristics of its pycnidia and conidia. However, as other species of the genus *Phomopsis* with similar cultural and morphological characteristics have also been reported on *Vaccinium* spp. (e.g. *P. australafricana*, *D. perjuncta*, *P. phaseolorum*, *P. columnaris*, *P. myrtilli*, *P. conorum*, *P. viticola*, etc.) (Farr et al., 2002a, b; OEPP/EPPO, 2009; Latorre et al., 2012), it is necessary to confirm the identity of the pathogen by performing analysis of the nuclear ribosomal DNA (rDNA) internal transcribed spacer (ITS) region on pure cultures of *D. vaccinii* (OEPP/EPPO, 2009). A higher level of confidence of the identification of *D. vaccinii* can be obtained by a multigene approach to phylogenetic analyses (Udayanga et al., 2011, Elfar et al., 2013, Lombard et al., 2014).

A detailed description of the cultural and morphological characteristics of *D. vaccinii* as well as of the methods recommended for its detection and identification are included in EPPO Standard PM7/86(1) (OEPP/EPPO, 2009).

3.2. Current distribution of *Diaporthe vaccinii* Shear

3.2.1. Global distribution of *Diaporthe vaccinii* Shear

According to EPPO PQR (2014) in Figure 1, *D. vaccinii* is present in North America (Canada and 12 States of the USA) with restricted distribution and in Chile following introduction from USA (EPPO PQR, version 5.3.1, accessed in June 2014). *D. vaccinii* has been found in Europe. In Germany, Lithuania, Romania and the United Kingdom (Scotland and England) the fungus is no longer present. In Latvia it is present with restricted distribution. In the Netherlands, one single plant of *V. corymbosum* was found infected in 2006 at a company producing blueberry fruits, as a result of annual survey activities in blueberry. The fungus was initially identified as *Phomopsis* sp. and, in 2007, the pest was more specifically identified as *D. vaccinii* (Netherlands Plant Protection Service, 2009). In May 2011, disease symptoms were found at another fruit production facility in the same area of the Netherlands as the first finding (Province of Limburg) on *V. corymbosum*. In the same year, similar symptoms were detected in a forest (on *V. myrtillus*) in the province of Gelderland. In December 2012, the pest was identified as *D. vaccinii*. The pest status in the Netherlands is currently 'transient—under surveillance' (National Plant Protection Organization, 2013). However, recent molecular studies revealed that this finding on *V. myrtillus* was a misidentification, and therefore, *D. vaccinii* has not been found so far outside a nursery in the Netherlands (Lombard et al., 2014).

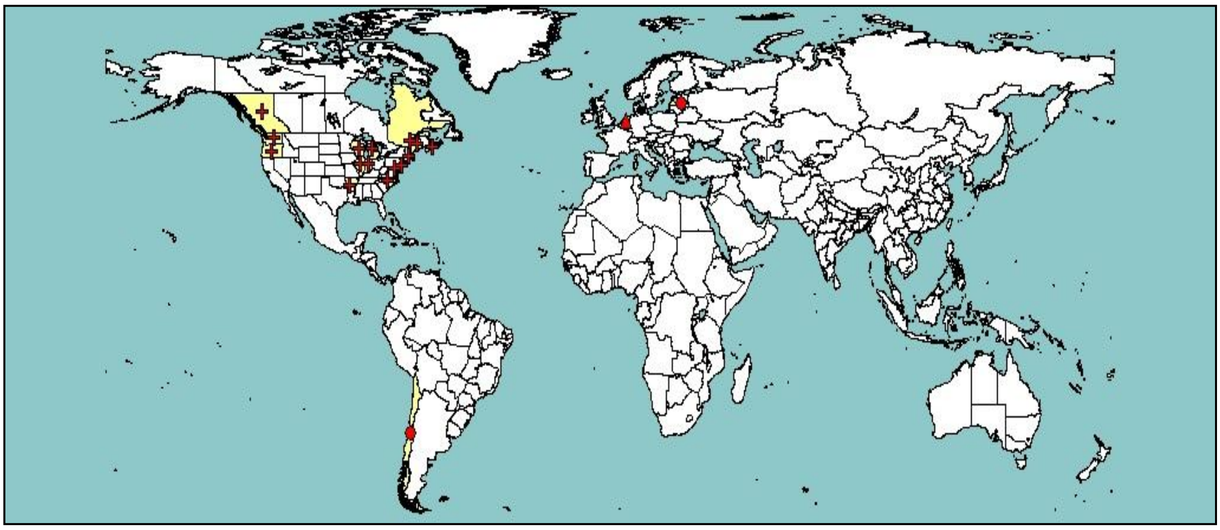

Figure 1: Global distribution map for *Diaporthe vaccinii* (EPPO PQR, 2014, version 5.3.1, accessed on June 2014). Red circles represent pest presence as national records and red crosses represent pest presence as subnational records (note that this figure combines information from different dates, some of which could be out of date).

3.2.2. Distribution in the EU of *Diaporthe vaccinii* Shear

As indicated by the EPPO PQR (2014) and the answers to a questionnaire sent by EFSA to MSs (Table 2), *D. vaccinii* is currently present in Latvia (with restricted distribution) and the Netherlands (transient, incidental findings, under surveillance). In Germany, the pest has been eradicated. In Lithuania, Romania and the United Kingdom, the pest is no longer present.

Table 2: Current distribution of *Diaporthe vaccinii* in the risk assessment area, based on the EPPO PQR database and the answers received from the NPPOs[(a)] of the EU Member States, Iceland and Norway until 3 June 2014.

Member State	Pest status according to EPPO PQR (2014)	Pest status according to the responses to the EFSA questionnaire received from the NPPOs of the EU Member States
Austria		**Absent**, no pest records
Belgium		**Absent**, no pest records
Bulgaria		**Absent**, current status confirmed
Croatia		**Absent**, no pest records
Cyprus		– [(b)]
Czech Republic		**Absent**, no pest records
Denmark		Not known to occur
Estonia		**Absent,** no pest records
Finland		**Absent**, confirmed by survey
France		–
Germany	**Absent**, pest eradicated	Current status confirmed
Greece		–
Hungary		**Absent**, no pest records
Ireland		**Absent**, no pest record
Italy		Never reported
Latvia[(c)]	**Present,** restricted distribution	–
Lithuania	**Absent,** pest no longer present	–
Luxembourg		–
Malta		**Absent**, no pest records
Poland		**Absent** [(d)]
Portugal		No records
Romania	**Absent,** pest no longer present	–
Slovak Republic		**Absent**, no pest records
Slovenia		**Absent**, no pest records
Spain		**Absent**
Sweden		**Absent**, not known to occur
The Netherlands	Transient, under eradication	Transient, incidental findings, under surveillance
United Kingdom	**Absent,** pest no longer present	**Absent**
Iceland		–
Norway		–

(a) National Plant Protection Organisations.
(b) No information available.
(c) Information from Latvian NPPO dated 27 June, 2014: *D. vaccinii* was detected in 2009 on cranberry twig samples originating in a commercial field and detected again during the following years. In 2012, the identity of the fungus was confirmed by using molecular methods. Present in Latvia only in some areas where host crops are grown. No information is available about importance of damage.
(d) Over the period 2009–2013, a total of 1 204 visual inspections were carried out by the SPHSI on *Vaccinum* plants.

3.3. Regulatory status

3.3.1. Legislation addressing *Diaporthe vaccinii* Shear (Directive 2000/29/EC)

The pathogen is regulated as a harmful organism in the EU and is listed in Council Directive 2000/29/EC in the following sections (Table 3):

Table 3: *Diaporthe vaccinii* Shear in Council Directive 2000/29/EC

Annex II, Part A	Harmful organisms whose introduction into, and spread within, all Member States shall be banned if they are present on certain plants or plant products
Section I	Harmful organisms not known to occur in the Community and relevant for the entire Community
(c)	Fungi
Subject of contamination	Plants of *Vaccinium* spp., intended for planting, other than seeds

3.3.2. Legislation addressing hosts of *Diaporthe vaccinii* Shear (Directive 2000/29/EC)

For import into the EU, special requirements are in effect for *Vaccinium* spp., because these species belong to the category of deciduous trees and shrubs, have roots, and they may have been naturally or artificially dwarfed.

Table 4: Host plants of *Diaporthe vaccinii* Shear in Council Directive 2000/29/EC

Annex IV, Part A **Section I** **(33)**	-for plants (of *Vaccinium)* with roots, originating outside the EU, planted or intended for planting, grown in the open air, an official statement is required that the place of production is known to be free from *Clavibacter michiganensis* ssp. *sependonicus*, *Globodera pallida*, *Globodera rostochiensis* and *Synchytrium endobioticum*.
Annex IV, Part A **Section I** **(39)**	-for trees and shrubs intended for planting, other than seeds and plants in tissue culture, originating in third countries other than European and Mediterranean countries, an official statement is required that the plants: • are clean (i.e. free from plant debris) and free from flowers and fruits, • AND have been grown in nurseries, • AND have been inspected at appropriate times and prior to export and found free from symptoms of harmful bacteria, viruses and virus-like organisms, and either found free from signs or symptoms of harmful nematodes, insects, mites and fungi, or have been subjected to appropriate treatment to eliminate such organisms.
Annex IV, Part A **Section I** **(40)**	-for deciduous trees and shrubs, intended for planting, other than seeds and plants in tissue culture, originating in third countries other than European and Mediterranean countries, an official statement is required that the plants are dormant and free from leaves.
Annex IV, Part A **Section I**	-for naturally or artificially dwarfed plants of *Vaccinium* intended for planting other than seeds, originating in non-European countries, an official statement is required that:

(43)	(a) the plants, including those collected directly from natural habitats, shall have been grown, held and trained for at least two consecutive years prior to dispatch in officially registered nurseries, which are subject to an officially supervised control regime, (b) the plants on the nurseries referred to in (a) shall: (aa) at least during the period referred to in (a): • be potted, in pots which are placed on shelves at least 50 cm above ground, • have been subjected to appropriate treatments to ensure freedom from non-European rusts: the active ingredient, concentration and date of application of these treatments shall be mentioned on the phytosanitary certificate provided for in Article 7 of this Directive under the rubric ‘disinfestation and/or disinfection treatment’. • have been officially inspected at least six times a year at appropriate intervals for the presence of harmful organisms of concern, which are those in the Annexes to the Directive. These inspections, which shall also be carried out on plants in the immediate vicinity of the nurseries referred to in (a), shall be carried out at least by visual examination of each row in the field or nursery and by visual examination of all parts of the plant above the growing medium, using a random sample of at least 300 plants from a given genus where the number of plants of that genus is not more than 3 000 plants, or 10 % of the plants if there are more than 3 000 plants from that genus, • have been found free, in these inspections, from the relevant harmful organisms of concern as specified in the previous indent. Infested plants shall be removed. The remaining plants, where appropriate, shall be effectively treated, and in addition shall be held for an appropriate period and inspected to ensure freedom from such harmful organisms of concern, • have been planted in either an unused artificial growing medium or in a natural growing medium, which has been treated by fumigation or by appropriate heat treatment and has been of any harmful organisms, • have been kept under conditions which ensure that the growing medium has been maintained free from harmful organisms and within two weeks prior to dispatch, have been: – shaken and washed with clean water to remove the original growing medium and kept bare rooted, or – shaken and washed with clean water to remove the original growing medium and replanted in growing medium which meets the conditions laid down in (aa) fifth indent, or – subjected to appropriate treatments to ensure that the growing medium is free from harmful organisms, the active ingredient, concentration and date of application of these treatments shall be

	mentioned on the phytosanitary certificate provided for in Article 7 of this Directive under the rubric 'disinfestation and/or disinfection treatment'. (bb) be packed in closed containers which have been officially sealed and bear the registration number of the registered nursery; this number shall also be indicated under the rubric *additional declaration* on the phytosanitary certificate provided for in Article 7 of this Directive, enabling the consignments to be identified.
Annex IV, Part B **Section II** **(24)**	-for trade and movement of within the EU – this part requires that there shall be evidence that the place of production is known to be free from *Clavibacter michiganensis* subsp. *sepedonicus*, *Globodera pallida*, *Globodera rostochiensis* and *Synchytrium endobioticum.*
Annex V, Part B **Section I** **(2)**	Since *Vaccinium* spp. are woody shrubs and cannot be considered herbaceous plants, this part of Council Directive 2000/29/EC does not apply and there are no requirements for plant health inspections or plant passport for plants of *Vaccinium*, intended for planting, originating in the EU.
(3)	According to this part of Council Directive 2000/29/EC a plant health inspection in the country of origin or the consignor country is required for fruits of *Vaccinium*, originating in non-European countries. However, *D. vaccinii* is not regulated for such fruits.

3.3.3. Marketing Directives

Host plants of *D. vaccinii* are also regulated under Marketing Directives of the EU (Table 5).

Table 5: *Diaporthe vaccinii* Shear host plants in EU Marketing Directives.

Plant propagation material	Marketing directive	Comment
Vaccinium L.	Council Directive 2008/90/EC of 29 September 2008 on the marketing of fruit plant propagating material and fruit plants intended for fruit production	Official inspections check if the material meets criteria for: Identity; Quality; Plant health; The rules also cover batch separation & marking, identification of varieties and labelling.

3.4. Elements to assess the potential for establishment and spread of *Diaporthe vaccinii* Shear in the EU

3.4.1. Host range

Hosts of *D. vaccinii* are restricted to *Vaccinium* species. The principal hosts are American and European cranberries (*V. macrocarpon*, *V. oxycoccos*, *V. oxycoccos* var. *intermedium*), highbush blueberry (*V. corymbosum*), rabbiteye blueberry (*V. ashei*), cowberry (*V. vitis-idaea*), and autochthonous species of European *V. myrtillus* (Shear et al., 1931, Wilcox, 1939, 1940; Milholland, 1982; Teodorescu et al., 1985; Guerrero and Godoy, 1989; Caruso and Ramsdell, 1995; OEPP/EPPO, 1997, 2009). The wild European species *V. oxycoccos*, which usually occurs in mountain bogs, could be a potential reservoir for the disease (EPPO, 1997; Gomes et al., 2013).

3.4.2. EU distribution of main host plants

There are no specific data on distribution of cultivated *Vaccinium* species (e.g. cranberries, blueberries, etc.) in Eurostat. Nevertheless, it may be assumed that *Vaccinium* species are included under the general category "other berries" in the Eurostat database. According to the Eurostat database, "other berries" are cultivated in 11 MSs (Table 6), with Poland, Hungary, Lithuania and Serbia showing the greatest acreage.

Cranberries and blueberries have also been cultivated in Latvia since 1985 (Abolins et al., 2009; Vilka et al., 2009a, b). In 2009, cranberry production in Latvia covered an area of approximately 100 ha (making Latvia the third largest producer in the world), while blueberry plantation accounted for about 170 ha, the lowest amongst the European blueberry-producing countries.

Table 6: Acreage (×1 000 ha) cropped with "other berries"(a) based on Eurostat

Country	2011	2012	2013
Austria	0.1	0.1	0.1
Croatia	0.4		0.6
Denmark	0.2		
Finland			0.4
Hungary	4		
Lithuania	2.6	1.9	
Poland	8.9	12.4	11.9
Portugal	0.3	0.3	0.3
Romania			0.2
Serbia		3.4	
The Netherlands	0.7	0.7	0.7

(a) Berries other than strawberries, currants, blackcurrants, redcurrants, raspberries, gooseberries.

Based on Brazelton (2011), the area grown commercially with blueberry in Europe increased from 1 821 ha in 1995 (not shown in Table 7) to 8 191 ha in 2010 (Table 7), with 42 % of this area being in eastern Europe, 29 % in central and northern Europe and 19 % in southern and western Europe.

Table 7: Area and production of blueberry in Europe (adapted from Brazelton, 2011*)

Country	Area (hectares)				2010 Production (×1000 kg)		
	2005	2007	2008	2010	Fresh	Process	Total
France	300	327.8	339.9	360.2	1 701.0	99.8	1 800.8
Spain	200	756.8	849.9	1 052.2	7 997.0	0.0	7 997.0
Portugal	40	129.5	133.6	194.3	1 097.7	0.0	1 097.7
Southern and western Europe	540	1 214.1	1 323.4	1 606.7	1 0795.7	99.8	10 895.5
Austria	0	40.5	44.5	50.6	272.2	49.9	322.1
Denmark	0	20.2	20.2	24.3	127.0	13.6	140.6
Netherlands	0	234.7	242.8	259.0	1251.9	127.0	1 378.9

Country	Area (hectares)				2010 Production (×1000 kg)		
	2005	2007	2008	2010	Fresh	Process	Total
Germany	1 600	17 80.7	2 049.0	2 144.9	84 95.9	548.9	9 044.8
Irelands	0	10.1	14.2	14.2	59.0	0.0	59.0
Italy	180	218.5	242.8	275.2	1 651.1	99.8	1 750.9
Sweden	0	32.4	32.4	36.4	99.8	4.5	104.3
Switzerland	0	20.2	20.2	22.3	90.7	45.4	136.1
UK	20	222.6	222.6	271.1	1 088.6	45.4	1 134.0
Central and northern Europe	1 800	2 580.0	2 888.7	3 098.0	1 3136.3	934.4	14 070.7
Baltics	0	101.2	117.4	135.6	499.0	0.0	499.0
Poland	1600	2 711.5	2792.4	3 156.7	6 277.8	4 495.2	107 73.0
Ukraine	0	64.8	72.8	76.9	199.6	99.8	299.4
Romania	0	40.5	48.6	52.6	190.5	0.0	190.5
Others	0	48.6	56.7	64.8	40.8	40.8	81.6
Eastern Europe	1 600	2 966.5	3087.9	3 486.5	7 207.7	4 635.8	11 843.5
Europe total	3 940	6760.5	7 300.0	8191.1	31 139.6	5 670.0	36 809.6

*Data from Brazelton (2011) were transformed from acres to hectares (1 acre = 0.4047 ha) and from lbs to kg (1 lb = 0.4536 kg).

In addition, *Vaccinium* species are common components of the low shrub in conifer woods and moorland (Engelmark and Hytteborn, 1999). No data are available on the current distribution of *Vaccinium* spp. in the risk assessment area. However, the "Climatic Modelling of Distribution Ranges of Plant Species" project showed that *V. myrtillus* has a wide potential distribution in Europe (Figure 2, also available online: http://www2.biologie.unihalle.de/bot/ag_chorologie/areale/VERBREITUNG.php?sprache=E&arealtyp=Arealtyp%2011.02&art=Vaccinium%20myrtillus).

Figure 2: Potential distribution of *Vaccinium myrtillus* in Europe based on climatic modelling. Source: "Climatic Modelling of Distribution Ranges of Plant Species" project; also available at: http://www2.biologie.unihalle.de/bot/ag_chorologie/areale/VERBREITUNG.php?sprache=E&arealtyp=Arealtyp%2011.02&art=Vaccinium%20myrtillus)

3.4.3. Analysis of the potential distribution of *Diaporthe vaccinii* Shear in the EU

Based on the current distribution of *D. vaccinii* in North America [as indicated in the Plantwise Map, adapted from Peel et al. (2007)], the fungus develops under the following cold climates of the Köppen–Geiger classification (Peel et al., 2007): Dfa, Dfb, Dfc and Dsb (D = cold; f = without dry season; s = dry summer; a, b and c = hot, warm and cold summer, respectively), and in the temperate climates Cfa and Cfb (C = temperate) (Figure 3). In the risk assessment area, D climates are prevalent in the Alpine and north-eastern zones, and C climates in the north-western ones and in the Po Valley, Italy (Figure 3). Therefore, suitable climatic conditions for *D. vaccinii* are present in several MSs. Records from Latvia and the Netherlands clearly indicate that the fungus can establish in those countries.

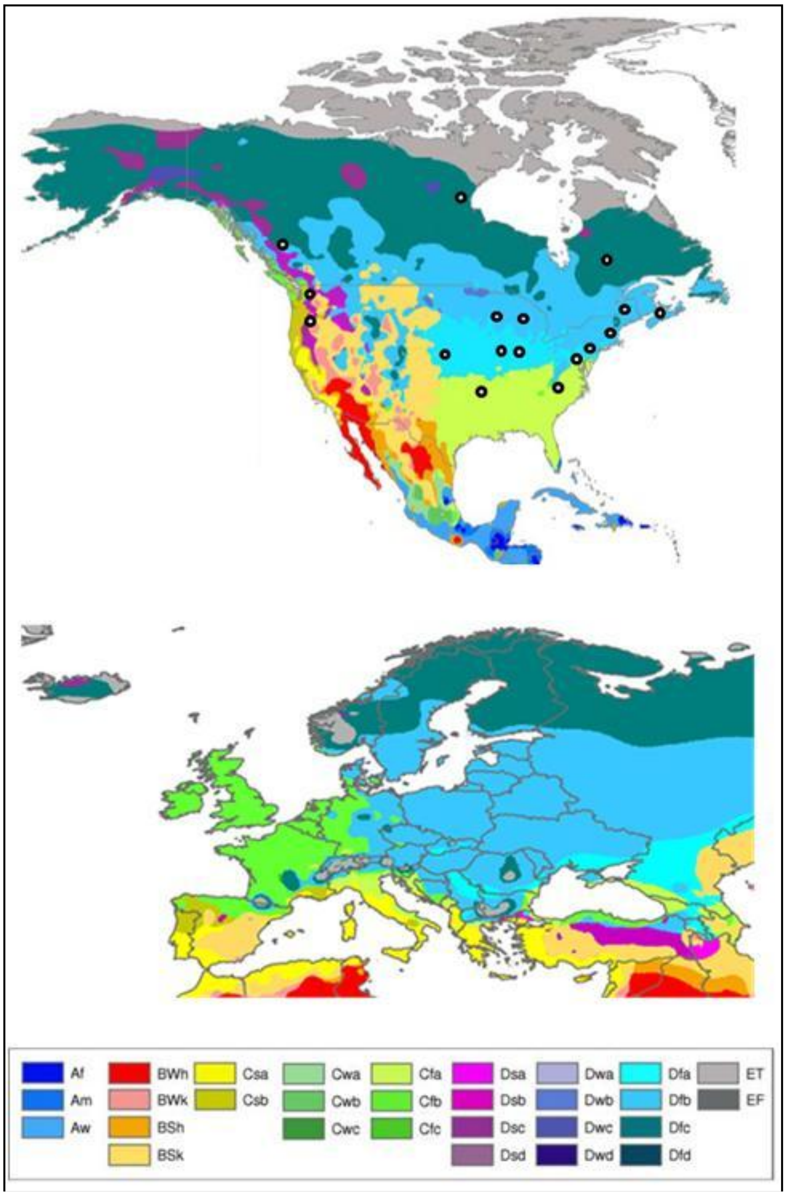

Figure 3: Köppen–Geiger climate maps of North America and Europe (adapted from Peel et al., 2007)

3.4.4. Spread capacity

3.4.4.1. Spread by natual means

Conidia of *D. vaccinii* produced within pycnidia on infected plant tissues (twigs, stems, etc.) still attached to the plant or lying on the soil surface are usually dispersed over short distances by rain splash, overhead irrigation, surface flow of water or wind-blown rain (Parker and Ransdell, 1977; Milholland, 1982; Diekmann et al., 1994). In field studies carried out by Parker and Ramsdell (1977) in Michigan, US, the major period of conidial dispersal occurred during rains from bloom through petal fall in late May and June, and during rains in June and August. After this period inoculum was depleted, as no conidia were trapped after September although there was considerable rain. Once established, the pathogen has a high potential for local spread by natural means, but the rate of spread may be retarded by unfavourable environmental conditions (e.g. low temperatures, dry weather). Although no evidence exists, insects or birds may act as carriers of the pathogen between *Vaccinium* spp. plants, as in the case of other *Phomopsis* species.

3.4.4.2. Spread by human assistance

The pathogen can spread over long distances via the movement of infected or contaminated host plants for planting, particularly asymptomatic plants (Wilcox and Falconer, 1961; Baker, 1972; Guerrero and Godoy, 1989). Infected *Vaccinium* spp. plants exported from North America to other countries have been assumed to be the main pathway by which the pathogen was introduced into new areas (Wilcox and Falconer, 1961; Baker, 1972; Guerrero and Godoy, 1989). Although there is no information available in the literature, it may be assumed that the pathogen, like other *Phomopsis* species, can spread with pruning tools and agricultural machinery.

3.5. Elements to assess the potential for consequences in the EU

3.5.1. Potential effects of *Diaporthe vaccinii* Shear

3.5.1.1. Pest effects on host plants

Some previous reports showed that the disease is commonly established in the USA on cranberries and blueberries (Friend and Boone, 1968; Farr et al., 1989). *D. vacciniii* was considered to be of minor importance in the late 1940s (Wilcox, 1939). In Massachusetts, in 1933, Phomopsis dieback was responsible for a reduction of 18–35 % in the cranberry crop in several plots (Bergman and Wilcox, 1936). The disease became serious in Wisconsin in 1966, where it severely affected stems of host plants and caused serious losses in some areas (Friend and Boone, 1968). In 1975, Phomopsis dieback was reported to be epidemic in the centre of the blueberry-producing area in Indiana and southern Michigan, and *D. vaccinii* was then considered to be a serious pathogen under favourable conditions (Weingartner and Klos, 1975). In Wisconsin, storage losses of up to 65 % were reported on cranberries, but they were caused by a complex of three fungal pathogens, including *D. vaccinii* (Carlson, 1963). Twig blight of susceptible blueberry cultivars has been estimated to cause fruit loss of 1.14–1.7 kg per bush in North Carolina (Milholland, 1982). In New York supermarkets in 1978 and 1979, Phomopsis fruit rot accounted for 0.5 % loss of the 15.2 % defective fruit (Milholland and Daykin, 1983). Recently, Olatinwo et al. (2004) demonstrated that five fungi, including *P. vaccinii*, were the most frequently associated with storage rot of cranberries in Michigan. The same authors showed that the relative frequencies of isolation of *P. vaccinii* from rotted cranberry fruit ranged between 1 and 20 % and the percentage of cranberry beds infected with *P. vaccinii* ranged between 10 and 50 % from 1999 to 2001. Clive (2007) reported that in North Carolina (USA) *D. vaccinii* causes a fruit rot on blueberry at harvest. However, no information is provided on the level of losses caused by the pathogen.

3.5.1.2. Environmental consequences

As *Vaccinium* spp. are common components of the low shrub vegetation in conifer woods and moorland of the EU (Engelmark and Hytteborn, 1999), the pathogen has the potential to cause environmental consequences in the risk assessment area.

3.5.2. Observed impact of *Diaporthe vaccinii* Shear in the EU

There are limited data about the impact of *D. vaccinii* in the EU MSs where the fungus was detected. Given that the pest has been eradicated in Germany, is no longer present in Lithuania, Romania and the United Kingdom, and is considered 'transient, under surveillance' in the Netherlands (EPPO PQR, 2014; questionnaire from this study), the Panel considers that the overall impact of the pest in the EU has been very low so far. This is further supported by studies conducted by Vilka et al. (2009a, b) in Latvia, which is the only EU MS where the pathogen is currently present, but with restricted distribution.

3.6. Currently applied control methods in the EU

In the EU, *D. vaccinii* is currently present only, and with restricted distribution, in Latvia (Vilka et al., 2009a, b). Nevertheless, the disease incidence has been reported to be very low and no information exists on any methods (cultural, chemical, etc.) applied for the control of *D. vaccinii* in the EU. One previous study in the EU from Romania showed that blueberry cultivars are susceptible to *D. vaccinii* but there are some variations in their susceptibility to the infection by the pathogen (Teodorescu et al., 1988).

3.7. Uncertainty

The main sources of uncertainties of this pest categorisation are listed below:

- Uncertainty on the real distribution of the pathogen in the EU: Difficulties in distinguishing *D. vaccinii* from other *Phomopsis* spp. on *Vaccinium* spp. No replies to EFSA questionnaire from some NPPOs, including Latvia, with respect to the pest status.
- Uncertainty on the real host distribution in the EU: Eurostat data on cultivated *Vaccinium* spp. are aggregated for "other berries" only. With respect to the distribution of wild host plants in forests, only a potential distribution map based on climate modelling is available.
- Uncertainty on the observed impact of the pest in the EU: Only one scientific report is available on the direct impact of *D. vaccinii* in the risk assessment area (from Latvia, where *D. vaccinii* is part of a complex of fungal species causing storage fruit losses). No data are available on environmental consequences and no information exists on control methods applied in Latvia.
- Uncertainty on the observed impact of the pest in non-EU countries: There is little information about the current impact of *D. vaccinii* in the USA both in plantations and in storage. In the latter case, the pest seems to belong to a complex of fungal species which are reported to cause storage losses. In addition, since some of these reports are not recent, there are uncertainties about the correct identification of *D. vaccinii*.

Uncertainty on the conclusion: the conclusion on the pest categorisation, based on the criteria of ISPM 11, is partially affected by the above-mentioned uncertainties concerning the potential impact of *D. vaccinii* in the risk assessment area. However, no conclusion can be reached on pest categorisation based on the criteria of ISPM 21, because there is lack of information about the level of potential consequences as a result of the use of infected host plants for planting.

CONCLUSIONS

The Panel summarises in the Table 8 below its conclusions on the key elements addressed in this scientific opinion in consideration of the pest categorisation criteria defined in ISPM 11 and ISPM 21 and of the additional questions formulated in the terms of reference.

Table 8: Panel's conclusions on the pest categorisation criteria defined in the International standards for Phytosanitary measures No 11 and No 21 and on the additional questions formulated in the terms of reference.

Criterion of pest categorisation	Panel's conclusions against ISPM 11 criterion Yes/ No	Panel's conclusions against ISPM 21 criterion Yes/ No	List of main uncertainties
Identity of the pest	*Is the identity of the pest clearly defined? Do clearly discriminative detection methods exist for the pest?* Yes, *D. vaccinii* satisfies this criterion. The identity of the pest is clearly defined. Discriminative detection methods exist for the pest [EPPO Standard PM7/86(1) and additional molecular methods recently developed].		-
Absence/ presence of the pest in the PRA area	*Is the pest absent from all or a defined part of the PRA area?* Yes, *D. vaccinii* fulfils this criterion. The pest is present with restricted distribution in Latvia and is under surveillance in the Netherlands.	*Is the pest present in the PRA area?* Yes, *D. vaccinii* fulfils this criterion. The pest is present in the risk assessment area.	Uncertainty about the real distribution of the pest in the EU.
Regulatory status	*In consideration that the pest under scrutiny is already regulated just mention in which annexes of 2000/29/EC and the marketing directives the pest and associated hosts are listed without further analysis. (the RM will have to consider the relevance of the regulation against official control)* Yes, *D. vaccinii* fulfils this criterion. The pest and/or its hosts are listed in Annexes IIAI, IVAI, IVBII and VBI of Directive 2000/29EC (see section 3.3.).		-
Potential establishment and spread	*Does the PRA area have ecological conditions (including climate and those in protected conditions) suitable for the establishment and spread of the pest?* *And, where relevant, are host species (or near relatives), alternate hosts and vectors present in the PRA area?* Yes, *D. vaccinii* fulfils this criterion Suitable ecoclimatic conditions are present in several MSs, but not in all the PRA area. *D. vaccinii* can spread by both	*Are plants for planting a pathway for introduction and spread of the pest?* Yes, *D. vaccinii* fulfils this criterion. The pathogen can spread via the movement of infected or contaminated host plants for planting, particularly asymptomatic ones.	No uncertainty about climate suitability in part of the risk assessment area, but uncertainty about host distribution.

	natural means and human assistance.		
Potential for consequences in the PRA area	*What are the potential for consequences in the PRA area?* *Provide a summary of impact in terms of yield and quality losses and environmental consequences.* Potential for consequences of *D. vaccinii* in the RA area is low. When detected in the EU, the pest was eradicated, or is under surveillance, or it has limited distribution. In one Latvian scientific paper, storage losses were observed on cranberry, but these losses are reported to be caused by a complex of pathogens including *D. vaccinii*, which was isolated with a low incidence. In the USA consequences are moderate and *D. vaccinii* is usually part of a complex of fungal species. In addition, since some reports are not recent, there are uncertainties about the correct identification of *D. vaccinii* in the older literature.	*If applicable is there indication of impact(s) of the pest as a result of the intended use of the plants for planting?* Specific information is not available.	Uncertainty on: • correct identification of *D. vaccinii* in the literature referring to pest consequences • whether control measures are applied in Latvia for the control of *D. vaccinii* • impact in Latvia (only one scientific paper is available) • the current impact of *D. vaccinii* in the USA both in plantations and in storage because of limited information available. In the latter case, the pest seems to belong to a complex of fungal species which are reported to cause storage losses.
Conclusion on pest categorisation	Based on the evidence, *D. vaccinii* does not have the potential to be a quarantine pest as it does not fulfil one of the pest categorization criteria defined in ISPM 11, that of having a severe impact.	Data are not sufficient to reach a conclusion on pest categorisation of *D. vaccinii* based on the criteria of ISPM 21 because there is lack of information about the level of potential consequences as a result of the use of infected host plants for planting.	Uncertainties mentioned above partially affect the conclusions on pest categorisation based on the criteria defined in ISPM 11

Conclusion on specific ToR questions	*If the pest is already present in the EU, provide a brief summary of* – *the analysis of the present distribution of the organism in comparison with the distribution of the main hosts, and the distribution of hardiness/climate zones, indicating in particular if in the PRA area, the pest is absent from areas where host plants are present and where the ecological conditions (including climate and those in protected conditions) are suitable for its establishment,* In the risk assessment area, *D. vaccinii* is currently present in one MS (i.e. Latvia) and absent from other MSs where host plants are present and the climatic conditions are suitable for its establishment. – *the analysis of the observed impacts of the organism in the risk assessment area.* There is only one scientific paper from Latvia on storage losses, but these losses are reported to be caused by a complex of fungal pathogens including *D. vaccinii*, with the latter being isolated with a low incidence.	-

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ABBREVIATIONS

EFSA:	European Food Safety Authority
EPPO:	European and Mediterranean Plant Protection Organization
EPPO-PQR:	European and Mediterranean Plant Protection Organization Plant Quarantine Retrieval System
EU:	European Union
ISPM:	International Standard for Phytosanitary Measures
MS(s):	Member State(s)
NPPO:	National Plant Protection Organisation
PLH Panel:	Plant Health Panel
RNQP:	Regulated Non Quarantine Pest