Express PRA for *Contarinia pseudotsugae* – Occurrence –

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First **initiation:** Occurrence of *Contarinia* sp., presumably *C. pseudotsugae*, in Baden-Württemberg, Brandenburg and Rhine-Land Palatinate

Initiation for revision: *Distribution in Germany; phytosantiary mesures are no longer useful*

Express Pest Risk analysis	***Contarinia pseudotsugae* Condrashoff**		
Phytosanitary risk for Germany	*Classification is no longer applicable as* Contarinia pseudotsugae *is widely distributed and does no longer fulfill the requirements for a quarantine pest. The containment is not deemed reasonable because of the natural distribution.*		
Certainty of assessment	**high** ☐	**medium** ☒	**low** ☐
Conclusion	The Douglas-fir needle midge *Contarinia pseudotsugae* is endemic in Northern America and already occurs in partial areas of Germany and the EU. It is not listed in the Annexes of Directive 2000/29/EC but was included in the EPPO-Alert-List in 2016. *Contarinia pseudotsugae* solely attacks Douglas firs. *Due to suitable climatic conditions* Contarinia pseudotsugae *established outdoors in Germany*. An establishment in Central and Northern European EU-Member States is also possible. Notwithstanding that *Contarinia pseudotsugae* possibly might cause considerable damage mainly in nurseries, young reforestation and in Christmas tree plantings, damage descriptions from the areas where the pest occurs in Germany and other EU Member States are rare. According to actual knowledge *Contarinia pseudotsugae* is already wide spread in Brandenburg and *North-Rhine-Westphalia* and is also present in different locations in Rhine-Land Palatinate and Baden-Württemberg. *The infestation status in Germany for* C. pseudotsugae *has to be designated as "present in partial areas".* C. pseudotsugae *is already present in partial areas in Germany where partly large areas are infested. The gall midge can effectively be distributed naturally. An eradication or a containment does no longer seem possible. Thus, § 4a of the Plant Inspection Order is no longer applicable; i.e. there is no obligation for notification, control or approval.*		

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Taxonomy	Hexapoda, Insecta, Diptera, Cecidomyiidae
Trivial names	Douglas-fir needle midge
Synonyms	-
Does a relevant earlier PRA exist?	Yes, in the Netherlands: Quick scan number: QS. Ent. 2015.08 access under: https://english.nvwa.nl/topics/pest-risk-analysis/documents/communicatie/diversen/archief/2016m/quickscan-contarinia-cf-pseudotsugae-december-2015 *Contarinia pseudotsugae* was included in the EPPO-Alert-List. A description is available from EPPO under https://www.eppo.int/QUARANTINE/Alert_List/insects/Contarinia_pseudotsugae.htm
Biology	*Contarinia pseudotsugae* performs only one generation per year. The larvae hibernate in the soil and pupate in early spring. The emergence is in April / May – depending on the weather conditions. After mating the females position their eggs on the needles of the Douglas firs. The gall midge mainly infests the new shoots of the host plants. The larvae emerge after a few days only and bore into the needles where they feed during summer which results in a typical formation of galls. In autumn the larvae fall to the ground and small triangular exit holes remain in the needles. Adult animals are small and orange-coloured with a very short life span of only a few days.
Is the pest a vector?	Actually there is no information available on this.
Is a vector needed?	No.
Host plants	So far, the Douglas fir *Pseudotsuga menziesii* is the only known host plant.
Symptoms	Initially the infested needles seem bluish. In the course of the vegetation period the needles get darker at the infested parts and partly change colour to reddish resp. brownish. A typical galling is a consequence of the feeding activities of the larvae. The needles seem to be swollen. They deform and finally fall down. In the USA it is described that up to 100% of the needles can drop. A heavy attack over several years can cause severe defoliation. (Bulaon 2010).
Presence of host plants in	The Douglas fir is the only exotic tree species of importance

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Germany	in forestry and covers with about 218,000 ha app. 2 % of the surface in Germany. Thus it is of great importance besides the endemic main tree species (BMEL 2014). Furthermore the Douglas fir is often used as an ornamental in gardens and recreation areas.
Presence of host plants in the Member States	No details available. Douglas firs mainly are cultivated in France and in Great Britain (Da Ronch et al. 2016).
Known infested areas	The main distribution areas are located in the USA and Canada (EPPO Global Database 2017). In recent years also the presence in Belgium, Germany, France and the Netherlands was described. In 2017, a more severe spread of the gall midge was reported especially in Brandenburg and in Rhine-Land Palatinate (Hielscher 2017).
Pathways	The gall midge is spread mostly via infested plants for planting, Christmas trees, cut foliage as well as via soil from infested areas. However, the import of the host plant from the USA and Canada into the territory of the EU is prohibited.
Natural distribution	The adult midges are able to fly. Information on their natural distribution potential is not available.
Establishment and distribution to be expected in Germany	*Contarinia pseudotsugae* was already detected in *four Federal States* in Germany. *Nevertheless, due to the spatial distance of the actual findings a wider distribution is assumed (Hielscher 2017).* Since the climate in its natural distribution area is comparable an establishment in Germany is likely.
Establishment and distribution to be expected in the Member States	*Contarinia pseudotsugae* was already found in Belgium, France and in the Netherlands. Since the climate is comparable to the climate of the natural distribution areas, further establishment in Central and Northern Europe is probable. *No phytosanitary control measures were taken either in Belgium or in the Netherlands as a wide distribution of the pest was assumed.*
Known damage in infested areas	In the USA, a needle loss up to 100% is possible (Bulaon 2010). There is considerable damage especially in Christmas tree plantings since the value of the trees is considerably reduced due to the defoliation. Damage caused by *Contarinia pseudotsugae* is generally not a mortality-inducing factor.

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Limitation of the endangered area in Germany	Due to the distribution of the host plant a limitation is not possible.
Damage to be expected in endangered area in Germany	Up to now damage caused by *Contarinia pseudotsugae* was merely described for Germany. Nevertheless, in the case of further spread, economic damage in young stands, nurseries and in Christmas tree plantings is possible.
Damage to be expected in endangered area in Member States	In the case of spread, economic damage in young stands, nurseries and in Christmas tree plantings is possible.
Control and measures	In the USA traps are positioned at ground level to watch for the flight time and for the application of insecticides. Also a parasitisation by *Platygaster* sp. is described (Simko und Proebsting 1982).
Detection and diagnosis	Morphological identification of the adults resp. the larvae in the needles. A molecular-biologically detection on species level is not possible at the moment since no referenced sequence material is available in the relevant databases. Thus a distinctive and certain diagnosis is not granted at the moment and confusion with the closely related *C. constricta* and *C. cunicolor* cannot be excluded.
Remarks	Only little information on the control of and the economic damage caused by *C. pseudotsugae* is available. *Despite some large infestation areas, no significant damage by C. pseudotsugae is known in Germany.*
Literature	BMEL 2014. Der Wald in Germany. Ausgewählte Ergebnisse der dritten Bundeswaldinventur. Hrsg. Bundesministerium für Ernährung und Landwirtschaft (BMEL), 10117 Berlin Bulaon, B. (2010) Forest Health Protection and State Forestry Organizations. Accessed on 13-09-2017 under http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5187407.pdf Da Ronch, F., Caudullo, G., de Rigo, D. 2016. *Pseudotsuga menziesii* in Europe: distribution, habitat, usage and threats. In: San-Miguel-Ayanz, J., de Rigo, D., Caudullo, G., Houston Durrant, T., Mauri, A. (Eds.), European Atlas of Forest Tree Species. Publ. Off. EU, Luxembourg, pp.146-147. EPPO Global Database 2017. Distribution Table *Contarinia pseudotsugae*. Accessed on 13-09-2017 under

Express Pest Risk analysis	*Contarinia pseudotsugae* Condrashoff
	https://gd.eppo.int/taxon/CONTPS/distribution Hielscher, K. 2017. *Contarinia pseudotsugae* (Condrashoff, 1961) (Diptera, Cecidomyidae): eine nordamerikanische Gallmücke an Douglasien im Nordostdeutschen Tiefland. Journal für Kulturpflanzen, 69 (10). S. 351–358. Simko, B. and Proebsting, B. 1982. Douglas-Fir. Needle midge ... Determining a Spray Schedule Through Use of a Midge Trap. Ornamentals Northwest Newsletter Archives 6 (1), 8 – 10.

Figure 2: Larva of *Contarinia pseudotsugae* in a needle
Source: Scott Tunnock, USDA Forest Service, Bugwood.org

Figure 3: Larva of *Contarinia pseudotsugae*
Source: Elizabeth Willhite, USDA Forest Service, Bugwood.org

Figure 1: Early infestation symptoms of *Contarinia pseudotsugae*
Source: John W. Schwandt, USDA Forest Service, Bugwood.org