

Screening of Emerging risks in Norway (ERIN). Judgments are preliminary and should not be considered as part of a final risk assessment:

***Synchytrium endobioticum* (Schilb.) Percival 1909**

**1. Taxonomic position:** (Synchytriaceae, Chytridiales, Chytridiomycetes, Fungi)

**Popular names** Potato wart disease (English); Potetkreft (Norwegian).

**2a. Status in Norway:**

Established <input checked="" type="checkbox"/>	Intercepted but not established <input type="checkbox"/>	Not intercepted <input type="checkbox"/>
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**2b. If this species is already established in Norway and this assessment is limited to a part of Norway where it may expand, define this part area of Norway:**

*Synchytrium endobioticum*, is a quarantine pest, which was introduced to Norway early in the 20<sup>th</sup> century. Only race 1 of the pathogen has been detected in Norway. Most potato varieties grown in Norway are resistant to race 1. In continental Europe there are races of *S. endobioticum* with virulence on Norwegian grown varieties, resistant to race 1.

The fungus produces resting spores that may survive up to 20-30 years in soil (EPPO, 1990). The last case detected in Norway was in 1994 (Hermansen et al. 2012). The Norwegian Food Safety Authority has declared Norway free of the pathogen.

Epidemics of potato wart have been most severe in coastal counties up to Trøndelag. The important potato producing counties, Oppland and Hedmark, have never experienced any case of potato wart.

**3. Area of native distribution in the world and information about introductions, expansions and eradications:**

The fungus *S. endobioticum* originates from the Andean region of South America, and it has a nearly worldwide distribution in areas where potatoes are cultivated. In most of tropical Africa, Middle East, Canada, Japan and Australia the fungus has not been detected.

**4. Sector in Norway expected to be impacted by the species (related to question 10 below):**

Agriculture <input checked="" type="checkbox"/>	Forest(ry) <input type="checkbox"/>	Ornamental/park/garden <input type="checkbox"/>	Fruit orchard/garden <input type="checkbox"/>
Greenhouse/protected <input type="checkbox"/>	Other sector, or not relevant <input type="checkbox"/> Describe:		

**5. Susceptible host(s) and/or type of environment(s) in Norway:**

Potato, *S. dulcamara*, *S. nigrum* and some other wild-growing *Solanum* species are susceptible.

**6. Description of damage:**

Infected potato tubers are deformed with cauliflower like growth. Also, stolons and lower parts of potato stems may become infected and deformed. Infection by soft rot bacteria and fungi causes rot in the infected tubers.

Potato wart may attacks may cause significant yield losses.

**7a. How is the overall probability of entry in Norway, or in a defined part of Norway?**

0. not relevant <input type="checkbox"/>	1. very low <input checked="" type="checkbox"/>	2. low <input type="checkbox"/>	3. medium <input type="checkbox"/>	4. high <input type="checkbox"/>	5. very high <input type="checkbox"/>
Level of uncertainty:		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	

With the current regulations on import of potato for planting there is very low probability of entry. Changes in the regulations, to allow import of seed potato for planting, will increase the probability of entry of *S. endobioticum* races with virulence on Norwegian grown potato varieties.

**7b. How is the overall probability of establishment in Norway, or in a defined part of Norway?**

0. not relevant <input type="checkbox"/>	1. very low <input type="checkbox"/>	2. low <input type="checkbox"/>	3. medium <input type="checkbox"/>	4. high <input type="checkbox"/>	5. very high <input checked="" type="checkbox"/>
Level of uncertainty:		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	

The probability for establishment of *S. endobioticum* races with virulence on Norwegian grown potato varieties is very high in most climatic zones for potato production in the country. The probability of establishment in the counties Oppland and Hedmark, with the most continental climate in the country, is expected to be low.

**8. How fast is the pest expected to expand in Norway, or in a defined part of Norway?**

< 0.3 km per year <input type="checkbox"/>	0.3 - 10 km per year <input type="checkbox"/>	10 - 30 km per year <input type="checkbox"/>	> 30 km per year <input checked="" type="checkbox"/>	
Level of uncertainty:		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>

Based on the rapid expansion of recent outbreaks of bacterial ring rot in Norwegian potato, the expansion of new races of *S. endobioticum* with potato for planting can be rapid.

**9. How large percent of potential environment type in Norway, or in a defined part of Norway, is expected to be colonized?**

< 5 % <input type="checkbox"/>	5 - 10 % <input type="checkbox"/>	10 - 20 % <input type="checkbox"/>	20 - 40 % <input type="checkbox"/>	> 40 % <input checked="" type="checkbox"/>
Level of uncertainty:		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>

New races of the pathogen has the potential to expand in most areas with potato production in Norway, with the exception of Oppland and Hedmark counties.

**10. How great a negative effect is the pest likely to have on economy including costs of control measures for the impacted sector in Norway, or in a defined part of Norway? Rate possible effects:**

0. not relevant <input type="checkbox"/>	1. minimal <input type="checkbox"/>	2. minor <input type="checkbox"/>	3. moderate <input type="checkbox"/>	4. major <input checked="" type="checkbox"/>	5. massive <input type="checkbox"/>
Level of uncertainty:		Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	

The potato growers are likely to suffer significant losses from outbreaks of new races of *S. endobioticum*.

**11. How important is the environmental impact likely to be in Norway, or in a defined part of Norway? Rate possible effects:**

0. not relevant <input type="checkbox"/>	1. minimal <input checked="" type="checkbox"/>	2. minor <input checked="" type="checkbox"/>	3. moderate <input type="checkbox"/>	4. major <input type="checkbox"/>	5. massive <input type="checkbox"/>
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Level of uncertainty:	Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
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There will minimal environmental impact from introduction of new races of *S. endobioticum* into Norway.

**12. How important is social damage likely to be in in Norway, or in a defined part of Norway? Rate possible effects:**

0. not relevant <input checked="" type="checkbox"/>	1. minimal <input type="checkbox"/>	2. minor <input type="checkbox"/>	3. moderate <input type="checkbox"/>	4. major <input type="checkbox"/>	5. massive <input type="checkbox"/>
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Level of uncertainty:	Low <input checked="" type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
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Social damage from new races of *S. endobioticum* is not relevant.

**13. Priority in Norway versus EPPO and EU:**

The pathogen *S. endobioticum* has been regulated as a Quarantine pest in Norway since it was first detected one hundred years ago. The pathogen is on the EPPO A2 list over pests recommended for regulation

**14. Specific questions for Norway:**

There is a current discussion in Norway on import of potato for planting. The current regulation only permits import of tissue cultures of new varieties. Propagation of a new variety to provide seed potato for commercial growers takes some years. Some growers want to import seed potato of new varieties to be able to start production quickly.

**15. Existing assessments:**

An EPPO datasheet is available at:

[https://www.eppo.int/QUARANTINE/data\\_sheets/fungi/SYNCEN\\_ds.pdf](https://www.eppo.int/QUARANTINE/data_sheets/fungi/SYNCEN_ds.pdf)

An assessment for Great Britain is available at: <http://www.cabi.org/isc/datasheet/52315>

**16. Requested assessments:**

The Norwegian Food Safety Authority has not requested any assessment of *S. endobioticum*

**17. Recommended type of assessment:**

A risk assessment is urgent and should be done for Norway

## References

Obidiegwu J, Flath K, Gebhardt C. 2014. Managing potato wart. A review of present research status and future prospects. Theoretical and Applied Genetics 127, 763-780.

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