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Your ref.:  
[Your ref.]

Our ref. :  
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## **Assessment of risk of adverse impacts on biodiversity caused by import and release of mycorrhizal forming fungi**

The Norwegian Environment Agency refers to the collaboration agreement signed between the Norwegian Environment Agency and VKM on 31 January 2019, as well as the mandate for assignments to VKM in 2019, and requests VKM to make a scientific assessment of adverse impacts on biodiversity concerning import and release of six mycorrhizal-forming fungi. Biological diversity is defined as the diversity of ecosystems, species and genetic variations within the species, and the ecological relationships between these components, cf. § 3 letter c.

This letter is the English translation of the assignment sent to VKM on 14 September 2019 (Our ref: 2019/12548).

### **Background**

In Norway, it has become more common to add different fungal spores of mycorrhizal-forming fungi to agricultural production agents. The Norwegian Environment Agency is aware that this is happening for several products that are being marketed today. Several of these products originate from outside Europe.

Several recent studies suggest that different biological properties that may be beneficial for increased production, may also increase the possibility for alien organisms to establish and spread, thereby potentially causing adverse impacts on native biodiversity (see literature).

The regulations relating to alien organisms under the Norwegian Nature Diversity Act, which entered into force on 1 January 2016, require permission to import and release products containing alien organisms. This also applies to mycorrhizal-forming fungi.

The Norwegian Environment Agency has received an application for the import and release of the mycorrhizae-forming fungi *Entrophospora columbiana*, *Glomus etunicatum*, *G. clarum*, *G. intraradices*, *Pisolithus tinctorius* and *Scleroderma citrinum*.

As a basis for processing of applications, the Norwegian Environment Agency requires a scientific assessment of the risk of unintended consequences for biodiversity concerning import and release of these species as input in agricultural production in Norway. The Norwegian Environment Agency also requires an assessment of what measures, as well as research and development work, that can be implemented to increase knowledge.

### **Assignment**

The Norwegian Environment Agency asks VKM to assess the risk of adverse impact on biodiversity concerning the import and release of the six species sought by:

1. Describe the natural distribution of the six species.
2. Identify potential hazards associated with the import and release of the species, including:
  - 2.1 Genetic changes in local populations / native individuals of the same species
  - 2.2 Spread of species beyond the natural range
  - 2.3 Effects on other native species, habitats and ecosystems
  - 2.4 Introduction and spread of hitchhiking organisms
  - 2.5 Other ecological effects
3. Assess the consequences of:
  - 3.1 Genetic changes in local populations / native individuals of the same species
  - 3.2 Spread of species beyond the natural range
  - 3.3 Effects on other native species, habitats and ecosystems
  - 3.4 Introduction and spread of hitchhiking organisms
  - 3.5 Other ecological effects
4. Assess the probability of:
  - 4.1 Genetic changes in local populations / native individuals of the same species
  - 4.2 Spread of species beyond the natural range

- 4.3 Effects on other native species, habitats and ecosystems
- 4.4 Introduction and spread of hitchhiking organisms
- 4.5 Other ecological effects

5. Characterize the risk of:

- 5.1 Genetic changes in local populations / native individuals of the same species
- 5.2 Spread of species beyond the natural range
- 5.3 Effects on other native species, habitats and ecosystems
- 5.4 Introduction and spread of hitchhiking organisms
- 5.5 Other ecological effects

In addition, the Norwegian Environment Agency asks VKM to:

6. Identify relevant risk mitigation measures (including mapping tools that can be used to detect relevant species) and evaluate their effectiveness and feasibility. A brief assessment of the possible negative effects of the measures on local biodiversity should be included.

If the introduction of the mycorrhizal-forming fungi may have adverse impacts on ecosystem services, this should be stated in the report, but not included as part of the assessment of the risk of adverse impacts on biodiversity.

The Norwegian Environment Agency requests that the risk of adverse impact for biodiversity be assessed from a 50-year perspective.

### **Legal background:**

The Nature Diversity Act Chapter IV.  
Regulation on alien organisms.

### **Conditions**

The risk assessment report must be written in English with a Norwegian summary. The report is published in dialogue with the Norwegian Environment Agency. We also refer to the collaboration agreement between the Norwegian Environment Agency and VKM. Deadline for delivery of the report: 5 June 2020

### **References**

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Best regards  
**Norwegian Environment Agency**

*This document has been signed electronically*

Bjarte Rambjør Heide  
seksjonsleder

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sjefingeniør