WildFood

PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

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WP2: PILOT PROJECTS FACT SHEETS (5/8)

Development of innovative biological agents in pest control on truffle plantations – An alternative way of preventing powdery mildew in young oak-truffle plantations

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Location: Komen, Sežana, Slovenia

Context:

In areas with higher average annual precipitation, oaks, in particularly *Quercus pubescens* and *Q. robur* tend to get regularly and abundantly infected by the powdery mildew. As powdery mildew grows well in high humidity and moderate temperatures conditions, it can appear and spread easily thus causing significant reduction of oaks leaf area. There are various ways known for preventing infestations of powdery mildew, based on various (non-specific) chemical methods, genetic resistance approaches, and use of biocontrol agents. In particularly the effects of chemical fungicides and fungi-targeting biocontrol agents on truffle mycelium in truffle plantations remain unknown, thus we are trying to find other ways of preventing powdery mildew infestations without (or with a minimum) negative effects on truffle mycelium growth in soils.

Objective:

The objective is to test the effects of a locally isolated strain of a harmless phyllosphere fungus from the phylum on the development powdery mildew on leaves of oaks in selected young truffle plantations. The strain of the harmless phyllosphere fungus was isolated from healthy oak leaves and after a preliminary small-scale testing successfully reduced the appearance of a typical powdery mildew manifestation on oaks leaves. Besides confirmation of the preliminary results, this pilot study also aims to quantify the ability of this fungus to preventing powdery mildew in young oak-truffle plantations, and to master the application method that would result in best prevention level. The proposed pilot study will be done on several small-scale truffle plantations distributed in the SW area of Slovenia, with typical warm to hot climate, high dew occurrence and an average annual precipitation over 1400-1600 mm.

Expected Results:

The main result of the pilot project is an improved application method for prevention of powdery mildew in young oak-truffle plantations using a phyllosphere fungal isolate of a local origin, and an approach with no predicted negative effects on the truffle mycelium in soils. The efficiency of the phyllosphere fungal isolate will be assessed through its foliar spraying application, and a consecutive monitoring of the (potential) appearance of the powdery mildew. Results of the pilot project performed on at least three distinct young oak-truffle plantations are expected to confirm the preliminary results and are expected to further contribute to the bringing the system to a market.

Figure 1. *Quercus pubescens* seedling (3 years old) inoculated with *Tuber melanosporum*, planted in the truffle plantation, in the area of Komen (Slovenija), not treated with the phyllosphere fungal isolate. Photo: T. Grebenc.

Figure 2. *Quercus pubescens* seedling (3 years old) inoculated with *Tuber melanosporum*, planted in the truffle plantation, in the area of Komen (Slovenija), three months after the treatment with the phyllosphere fungal isolate. Photo: T. Grebenc.