



Redefining Pest Management - a Holistic Approach

Practice Abstract N° 4

Detection of downy mildew on grape leaves with spectral image analysis

Downy mildew (*Plasmopara viticola*) is an endemic disease that affects vineyards worldwide. The disease can cause severe crop loss when it is not detected in an early stage. Early detection as part of an integrated pest management (IPM) system would be enormously beneficial to not just the farmer but also to the wider environment. In the scope of OPTIMA W2, a state-of-the-art decision support system (DSS) will be used to determine the risk of disease outbreak. In this research, we investigated the early detection of downy mildew with spectral image analysis, as input to the DSS, in order to precisely localise and quantify the infection, so that appropriate plant protection product type, dose, timing and location will be recommended. Image data was acquired in the field and in the greenhouse, using a spectral camera with high spectral resolution (200 bands). The spectral images were processed by a linear discriminant analysis that highlighted that the wavelengths at 550, 720, and 750 nm were most discriminative for classifying mildew infection from healthy leaf tissue. From our research, we conclude that downy mildew can be detected in an early stage with or spectral image analysis using a selection of wavelength bands.



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