

## Pre-infected grapevine planting material as a cause of Esca in vineyards?

Nicolai Haag<sup>1</sup>, Michael Fischer<sup>1</sup>

<sup>1</sup> Julius Kühn-Institut, Institute for Plant Protection in Fruit Crops and Viticulture, Siebeldingen  
Email of corresponding author: nicolai.haag@julius-kuehn.de

The grapevine trunk disease (GTD) Esca is caused by several wood-inhabiting fungi and can be observed in wine-growing regions all over the world. The fungi *Phaeoconiella chlamydospora* (*Pch*), *Phaeoacremonium aleophilum* (*Pal*) and *Fomitiporia mediterranea* (*Fmed*) are considered to be the main pathogens in Europe. Direct control strategies are very limited and their effectiveness is still questionable. As considerable economic losses may occur and even young vineyards and planting material can be affected, information on biology and epidemiology of the involved pathogens is required in order to develop effective and sustainable control measures. Accordingly, the current project aims at the investigation of epidemiological factors of *Pch*, probably the most important Esca pathogen for early infections of planting material, during nursery grapevine production. Over a period of three years the grapevine production process of three selected nurseries was investigated regarding the occurrence of *Pch* in various substrates, such as grapevine wood, dipping baths, callusing media, air and soil.

Wood samples, in particular rootstock wood, from grafting material, newly grafted vines, grafted vines from nursery fields and vines ready for sale were subjected to visual evaluation of *Pch*-related wood symptoms and detection of the actual presence of the pathogen

via culture on potato dextrose agar (PDA) and a very sensitive nested Polymerase chain reaction (PCR) method. In the same way, culture and nested PCR measures were applied in order to detect *Pch* in dipping baths, callusing media and soil from nursery fields. For detection of airborne *Pch* conidia spore traps were installed in the nurseries and tested through nested PCR.

Observations have shown an increase of *Pch*-associated wood symptoms over the year and the highest symptom frequency in vines ready for sale. The pathogen itself was frequently detected in wood, with detection rates being higher after planting of newly grafted vines in the fields, although detection rates were much lower than visual evaluations would have suggested. Regular detections of the pathogen exist for dipping baths and spore traps. In callusing media *Pch* was found only sporadically. No incidence in soil is determined to date. The detection of the Esca pathogen at different stages and substrates during the grapevine production process indicates that potential infection sources do exist. The overall low *Pch* detection rate in wood in relation to the observed frequencies of wood symptoms may point towards the involvement of further fungi, such as species of *Cadophora*, causing similar symptoms in the wood. To this end first investigations were undertaken supporting this assumption.