

Vinedress: A wound closure for vines made of polymer fibers

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During the last decades Esca has become one of the main diseases in vineyards. Esca, a complex comprising the three wood living fungi *Phaeomoniella chlamydospora* (Pch), *Phaeoacremonium aleophilum* (Pal) and *Fomitiporia mediterranea*, causes high yield losses every year and weakens the plants resulting in low quality vines. For all of these fungi, wounds in the bark of the vines are considered as the main entrance for spores. Therefore particular attention has to be paid to the winter pruning of vines where spores can easily invade the plant through numerous pruning wounds close to the stem head. For that reason the wounds have to be protected.

Conventional ways of protection like resins, waxes or the application of fungicides have not led to an improvement of the situation so far. As a result a new wound closure based on polymer fibers is currently tested. The wound closure will be applied directly after the pruning providing a physical barrier for the pathogens of the Esca disease, especially Pch and Pal as they infect the plant in an early age.

The new closure consists of electrospun fibers. The process of electrospinning provides a physically stable and elastic mat of fibers. The pore size of the fiber mats can be modified during the spinning process, defining not only the physical barrier for spores, but also properties like air- and water permeability. This permeability should promote the healing process of the plant and prevent rotting. Through the selection of the used polymers the fibers also should be biodegradable.

In this approach the tightness of different polymers is tested against spores and germination tubes of the fungi. First results show that not only pore size has an influence on the result but also the hydrophobicity of the polymers. The biodegradability of the different polymers is tested in soil and in the vineyard. Furthermore different methods of applications are evaluated as the fibers can be applied on the canopy or the electrospinning process can take place directly in the vineyard.