ESCA DISEASE BY VEGETATIVE MATERIAL IN FRENCH GRAPEVINE NURSERIES

Esca disease of grapevines is caused by white rot in the wood, which is also correlated with various foliar symptoms (mild form, apoplexy). The white rot results from the action of several micro-organisms: pioneer fungi leading to the formation of a brown necrosis in central position (Phaeomoniella chlamydospora (Pch), Phaeoacremonium aleophilum (Pal)) or in sectorial position (Eutypa lata), which is then colonized by Fomitiporia mediterranea responsible for the white rot. Because no control measures are known for vineyards, measures must be taken in nurseries to manage this syndrome. In this aim, we studied the life cycle of fungi associated with esca disease in nurseries and tested control measures for the production of healthy plants.

A study in nurseries on fungi associated with wood diseases showed the presence of pioneer fungi of esca disease in the woody tissues of canes intended for nurseries (grafts, rootstocks). But Eutypa lata and Fomitiporia mediterranea were not found. The analysis of isolations of segments located between 15th and 16th mm from the base of each cane of 3,840 grafts collected from a strongly esca-infected vineyard (35% in 1997), showed that Pch was present in 0.44% and Pal in 0.89% of the isolations. Molecular tools such as PCR also revealed the presence of fungi on the surface of the propagation material (grafts, rootstock), which could constitute a considerable source of inoculum for the contaminations observed in nurseries.

A survey in nurseries of the south-east of France showed that the pioneer fungi of esca disease were isolated from plants after nursery field. Their presence in the plants is more or less important according to the sample. This variability is probably due to the origin of the plant material and/or the nursery process. Groenewald et al. (2000), Tegli et al. (2000), Paino (personal communication)

The assumption of a contamination in nurseries was examined during two steps in the grapevine propagation process: callusing and planting. The propagation material (grafts, rootstock) whereas Pal was found preferentially at the top of the grafted cutting (graft, graft union, top of the rootstock) whereas Pch was mainly isolated from the zones located at their base (1 cm from the basal end, basal end).

Alicante Bouschet N 804 / 140 Ru 265
Chardonnay N 95 / Fercal 242
Syrah N 525 / 161-49 C 176
Grenache N 435 / 110 R 151
Grenache N 135 / 110 R 151
Chardonnay N 470 / Ru 140
Grenache N 530 / 3309 C 144
Syrah N 300 / 3309 C 144
Alicante Bouschet N 884 / 140 Ru 265
Syrah N 525 / 161-49 C 176
Chardonnay N 95 / Fercal 242
Grenache N 135 / 110 R 151
Grenache N 435 / 110 R 151

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Conclusion: These studies allowed to improve the knowledge on the life cycle of pioneer fungi in nurseries and on the control for the production of healthy planting material. Further studies should concern the identification of the state of fungi at the surface of propagation material and their localization, the identification of sources of inoculum of Pal responsible for contaminations in nursery fields (endo-inoculum or exo-inoculum). Further studies will test the efficiency of a combination of hot water treatment with other treatments in nurseries. Also, a change in nursery practices such as herbaceous grafted cuttings could be envisaged.