

FUNGI ASSOCIATED WITH WOOD DECAY DISEASES: IDENTIFICATION OF THE STEPS INVOLVING RISK IN A FRENCH NURSERY

A survey carried out in 2005 in the South-West of France estimated the presence of fungi associated with wood decay disease on nursery vine plants (Viguès, 2005). The rate of contaminated plants was irregular in different batches. For *Botryosphaeriaceae*, the rate was between 6 and 31 % in nursery plants and between 6.4 and 70 % in potted plants. *Phaeoconiella chlamydospora* (*Pch*) was often isolated from commercialized plants: according to the batch, the contamination rate was between 0.7 and 28 % for nursery plants and between 0.7 and 11 % for potted plants. *Phaeoacremonium aleophilum* (*Pal*) was less often detected: a maximum of 6 % of the nursery plants were contaminated.

SANITARY STATE OF PLANT MATERIAL ENTERING NURSERIES

◆ On the surface

The detection was done by PCR of the rinsing water of the surface of the plants.

Table 1 : Percentage of graft and rootstock carrying at their surface fungi associated with wood decay disease (means of 3 repetitions of 100 units each)

	<i>Pch</i>	<i>Pal</i>	<i>Botryosphaeriaceae</i>
Graft	21.3	0	11.3
Rootstock	8	1.3	4

◆ Inside the plants

Pch was present in 2 of the 900 analysed grafts and in only 1 of the 900 analysed rootstocks. *Botryosphaeriaceae* was present in only 1 graft and in 2 rootstocks. *Pal* was not found.

According to these results, a contamination could take place from the inoculum at the surface during the process of vine plant production.

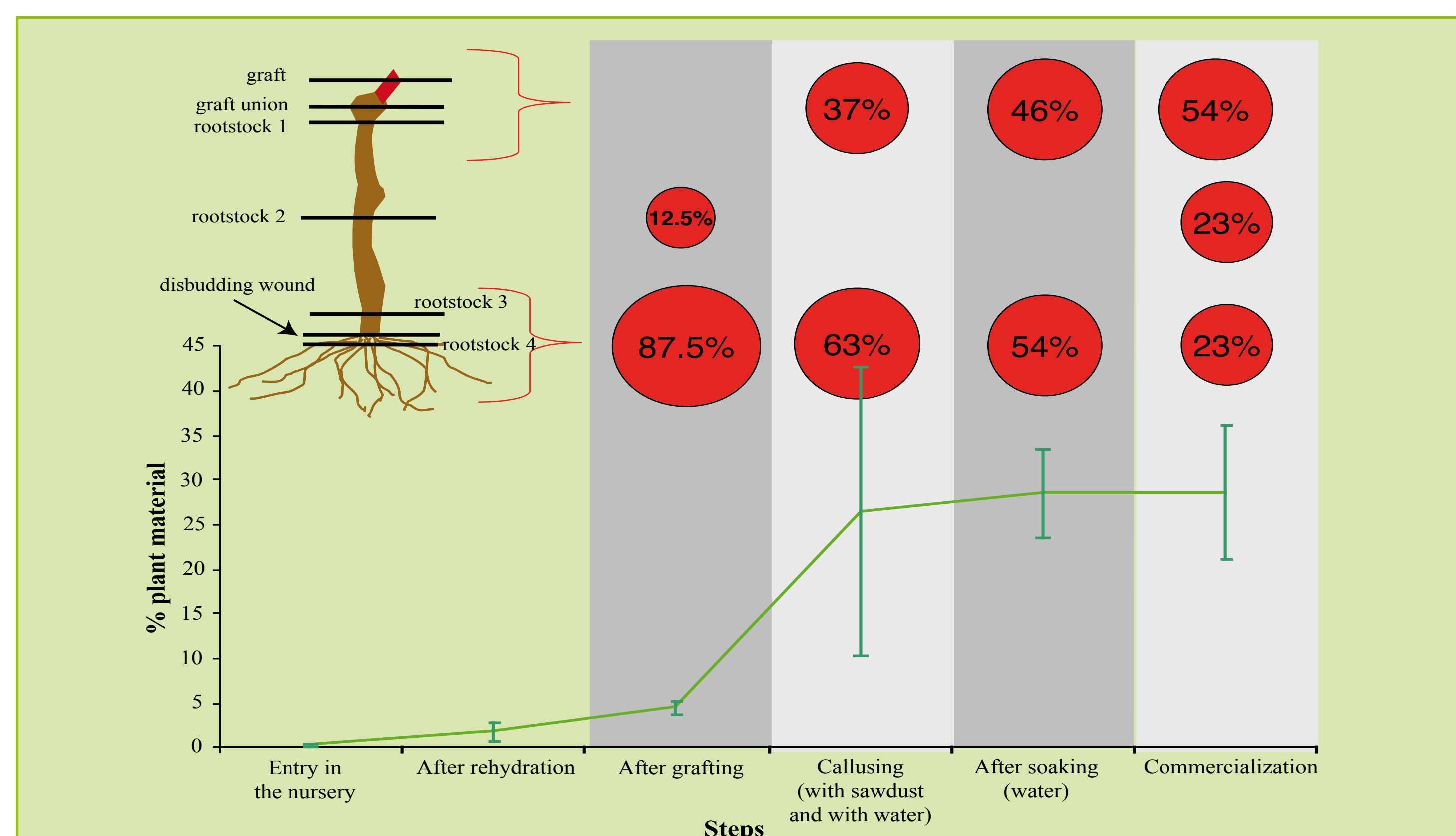
STUDY OF THE PRODUCTION PROCESS

A sampling of 100 units was taken after each step of the plant production process. This was repeated three times.

◆ *Botryosphaeriaceae*

The presence of *Botryosphaeriaceae* increased during the plant production process. They were almost absent when the plants entered nurseries and increased after grafting and even more during callusing (with sawdust or with water) to reach a maximum of 35 % of plants contaminated when commercialized. The three repetitions showed the same dynamic. The localization of the fungi seems to indicate that a contamination could take place at the bottom of the plant at the beginning of the production process, then another contamination could take place at the top of the plant during callusing.

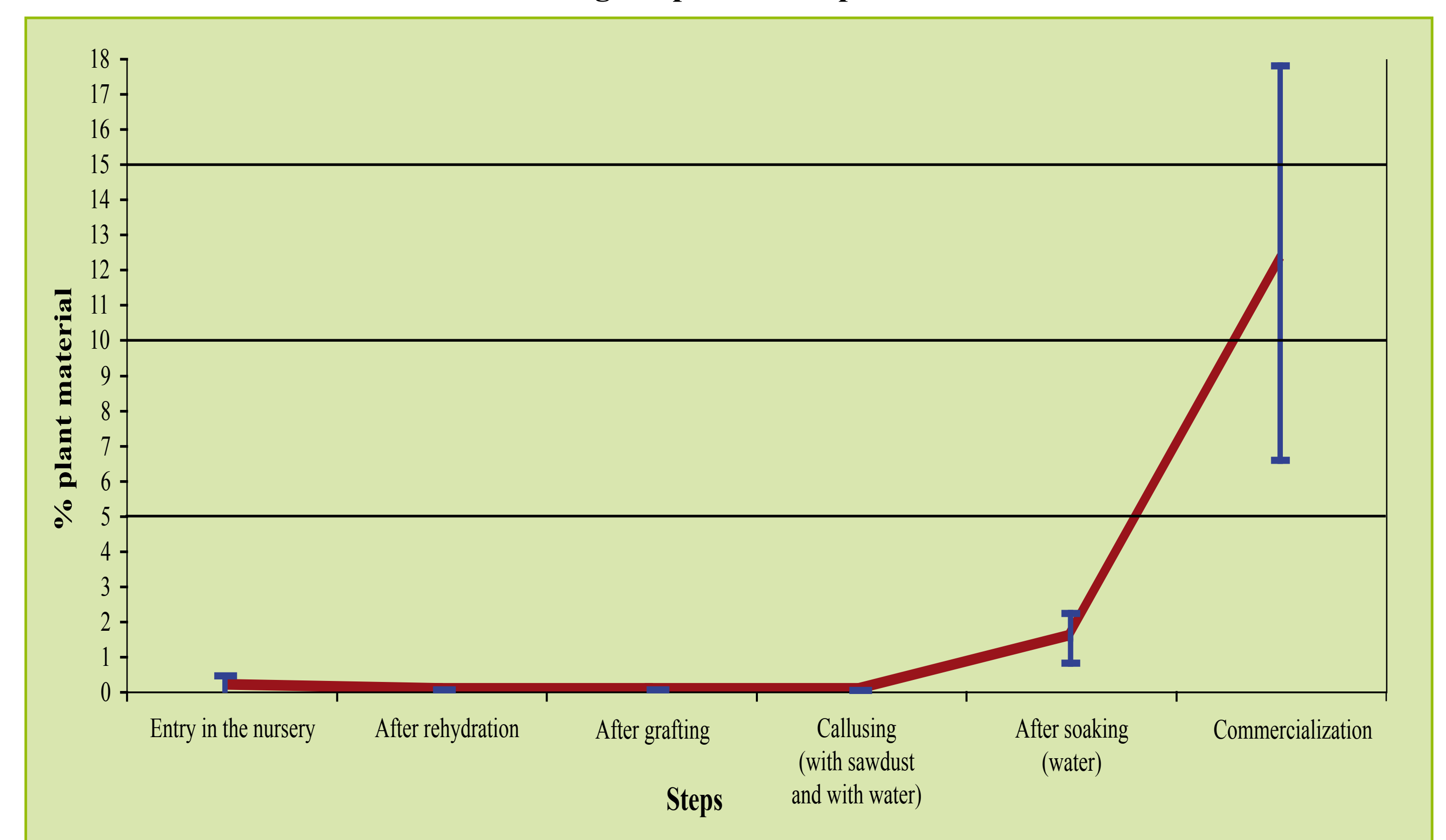
Figure 1: Evolution of the percentage of plants contaminated by *Botryosphaeriaceae* (means of 3 repetitions) and evolution of their localization in the grafted vines



◆ *Phaeoconiella chlamydospora*

Pch was less present than *Botryosphaeriaceae*. A maximum of 10 % of the plants presented this fungus when sold. During the production process, the increase of the contaminated plants was especially obvious during the commercialising period. At that period, *Pch* was distributed all over the plants. It thus seemed that a contamination takes place during the callusing step, or during their presence in greenhouse.

Figure 2: Evolution of the percentage of plants contaminated by *Pch* during the production process



WAYS FOR STOPPING THE CONTAMINATIONS

Different products were added to the rehydration solutions. Three repetitions of 100 plants were done for each treatment.

Table 2: Percentage of plants contaminated by fungi associated with wood diseases following treatments during rehydration (means of 3 repetitions)

		<i>Pch</i>	<i>Pal</i>	<i>Botryosphaeria obtusa</i>	<i>Neofusicoccum parvum</i>	Other <i>Botryosphaeriaceae</i>
After 1 month in nursery	Sodium hypochlorite 0.5 %	4.8	0	1.1	4.3	0
	Fungicide 1	4.44	0	0	1.2	3
	Cryptonol 3.5 %	10.2	0.8	2.4	9.2	0.8
	Control	2.66	0	1.36	7.89	4.62
After 6 months in nursery	Trichoderma T7	18.7	0	0	12.1	2.1
	Trichoderma T10	8.6	0	0	19.6	0
	Gliocladium roseum	14.7	0.74	0	25.8	3.4
	Control	6.5	0	0	17	6.2

CONCLUSION

This 2006 study showed that when entering nurseries, the plant material (grafts and rootstocks) was healthy but carried on their surface spores or/and mycelium of *Phaeoconiella chlamydospora*, of *Botryosphaeriaceae* and to a lesser extent of *Phaeoacremonium aleophilum*. The different bathes in the production process help the fungi to penetrate the grafted plants by the pruning wounds and thus contaminate them. The addition of chemical or biological products in the rehydration solutions did not bring any relevant answer to the presence of fungi.

Bibliography : Les champignons associés aux maladies du bois et la pépinière – résultats préliminaires. Viguès V., Serrano E., Dumas C., Coarer M., Yobregat O., Larignon P., Conférence EUROVITI, novembre 2005

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