Transmission of Rumple Symptoms to Nucellar Clones

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Recent trials in Sicily showed that rumple is not associated with Mn deficiency nor is it present in nucellar lemon clones.

To test a possible infectious nature of rumple in view of previous failures, propagative material of nucellar origin was grafted onto diseased lemon trees and sour orange seedlings. In the crop from these trees a high frequency of rumple symptoms was observed only on the topworked plants, which produced 17,920 affected fruits of 92,721 examined. No symptoms were seen in 14,490 fruits from nucellar lemon trees growing directly on sour orange seedlings. The unusual transmission method we employed and earlier data reported in the literature cause us to interpret our results cautiously.

There have been unrecognized indications in the past of rumple transmission in Italy and Florida. In Italy, rumple transmission experiments were performed by grafting buds from diseased plants onto healthy lemon trees. No trees produced fruits and no symptoms were noted on the vegetation. In 1974, tissue from rumple-affected lemon trees was inserted into healthy nucellar ones on Volkamer lemon rootstock. The inoculated trees produced 10/235 fruits with rumple symptoms, while the Volkamer lemon rootstock sprouts of two inoculated plants produced 8 normal fruits.

In Florida, graft transmission trials were performed on greenhouse-grown lemons and grapefruits, but no fruits were produced up to 6 years after grafting. Normal sweet oranges and grapefruits were produced by respective sprouts growing from the interstock of trees producing rumple-affected lemon fruits. This contrasts with the susceptibility of grapefruit to this disease in Ethiopia. In contrast, rumple symptoms were observed in lemon trees from nucellar propagation material imported from California, possibly due to infected interstocks. In this case, the type of transmission was similar to that described herein, i.e. healthy nucellar lemon buds were grafted onto latently infected grapefruit interstocks.

The traditional transmission method would very likely have given more specific results but with greater difficulty and over a longer period of time. The unusual graft transmission method used allows the disease agent to spread easily and rapidly and to obtain early fruit bearing plants.

On the basis of our results and discussion we believe rumple to be infectious even if symptoms could be attributed to other causes, such as hydric unbalances or other types of stress associated with differences between conducting tissues in nucellar and old lines.