

Evaluation of wood starch content on bench grafting success rate in grapevine

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Abstract (250 words)

Since the emergence of phylloxera, grafting has been the most used propagation method in viticulture. Despite all the improvement measures implemented in the nurseries, it is frequent that graft success rates vary depending on the nursery process and scion/rootstock combinations. The reasons behind this unsatisfactory behaviour are still unknown and can be diverse, although carbohydrate reserves might be hypothesised to be crucial, since callus, root, and new tissue formation will be built based on them. In order to identify the effect of carbohydrates on grafting success, nine combinations were established based on the starch content in grapevine scionwoods (cv. Tempranillo clone VN69) and rootstocks cuttings (110 Richter clone 237) used for grafting: Low (L), Medium (M), High (H). To perform this work, more than 90 plants were omega grafted per carbohydrate content combination and, after the callusing period, transferred to the rooting field. In August, nine plants per combination were uprooted and the grafting success rate was recorded as well as the vegetative growth and root system characteristics (number and diameter). Likewise, histological and histochemical characterization (cellulose, starch, callose and lignin) was performed at the graft interface. The implications of carbohydrate content on success rate will be discussed, comparing the grafting success rates obtained with potential symptoms of incompatibility, irregular cell arrangement, slower vascular differentiation, or persistence of the necrotic layer.

Keywords: histology, scion-rootstock interaction, starch, success rate, viticulture.