Characterizing graft union formation in different scion/rootstock combinations of grapevine

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Abstract (250 words)

In most viticultural regions, grapevines are cultivated grafted, employing either hybrid or pure species of various American *Vitis spp.*, such as *V. berlandieri*, *V. rupestris*, and *V. riparia*, as grapevine rootstocks. These rootstocks play a crucial role in providing resistance to the Phylloxera insect pest. Beyond Phylloxera resistance, it is desirable for grapevine rootstocks to exhibit resistance to other soil-borne pathogens and adaptability to abiotic stress conditions. The introduction of new rootstocks holds promise for adapting agriculture to climate change without altering the characteristics of the final harvested product. However, achieving high success rates in grafting for new rootstock genotypes is imperative. This study aims to develop quantitative techniques for characterizing graft union formation in different grapevine scion/rootstock combinations. The research focuses on the initial months after grafting, examining factors such as the quantity of callus (both fresh and dry mass) and the mechanical strength of the graft union. Interestingly, the quantity of callus at the graft interface varied among genotypes and did not necessarily correlate with the mechanical strength of the graft union. Challenges in quantitatively phenotyping different stages of graft union formation have impeded the identification of genetic determinants for grafting success across plant species. To address this bottleneck, various quantitative techniques are being developed to elucidate the genetic architecture of graft union formation in grapevine.

Keywords: scion, rootstock, grafting, callus, mechanical strength.