

Some Aspects Affecting Graft-Take in Avocados

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Abstract. The lack of secondary scion growth after budbreak in avocado grafts and other types of avocado graft failure have recently presented severe problems to South African avocado nurserymen. Graft failure has been classified as early scion death before petiole stub abscission, death at a later stage, and initial bud break without secondary scion growth. The literature revealed that many factors affect plant graft success and that these factors interact rather strongly. They were the graft partner compatibility, the grafting method and technique, the grafting environment, pests and diseases, and the physiological condition of both the rootstock and the graftwood. A comprehensive survey of South African avocado nurseries showed grafting problems were worse on clonal rootstocks and in some scion cultivars, particularly, 'Hass', and that they tended to be seasonal and unexplained. Problems varied from nursery to nursery, even between those in close proximity. Light microscopic examinations indicated that the lack of secondary scion growth was related to the lack of development of new vascular connections. Grafting experiments revealed that the grafting environment played a major role. The best conditions varied between experiments, but in general day/night temperatures in the region of 26/16C were better than those of 22/11 or 30/20C. Environment modification through the use of graft covers was beneficial. Rootstock physiological condition also had an effect on grafting success, but this could not be quantified in terms of rootstock growth. The presence of large seedling cotyledons improved graft-take. The biggest effect on graft-take was due to the physiological condition of the graftwood. The graftwood appeared to contain some factor that strongly influenced bud growth and hence the fate of the graft. Total nonstructural carbohydrate (TIMC) content of the graftwood and rootstocks was not related to grafting success. Seasonal TNC and dry matter cycles in 'Hass' and 'Fuerte' graftwood from a Thornville orchard were examined but no relationship with ill-defined periods of graft failure was apparent. Any single factor cited appeared to have the ability to cause graft failure, despite the influences of the other factors. A strong factor interaction was apparent.