

Commercialisation of Micro-grafting in macadamia

C. Searle¹ and K. Wilson²

¹Stahmann Farms; ²Eureka Macadamia Management Pty Ltd

c.w.searle@bigpond.com

Macadamia trees have traditionally been propagated by grafting mature scion wood onto selected seedling rootstocks. This process can take anywhere from fifteen months to two and a half years from planting the seed to the grafted tree being dispatched from the nursery, which adds considerably to the cost of production. In contrast, micro-grafting, grafting young trees at 10-12 weeks of age has the potential to deliver trees faster and cheaper than conventional grafting. The objective of this study was to commercialise the micro-grafting technique developed by CSIRO, Division of Horticulture.

The original CSIRO method used soft juvenile scion material that needed to be maintained at a high humidity post-grafting in order to prevent rapid desiccation. This was achieved by enclosing each grafted plant in its own polythene bag. As enclosing each plant in its own bag is extremely labour intensive, humidity post grafting in this study was maintained by using a sophisticated temperature and humidity controlled mist house. In a series of initial experiments it was found the relative humidity had to be maintained above 95% in order to prevent desiccation of the juvenile scion material and graft failure. However, the high humidity led to major outbreaks of fungal diseases which rapidly killed the newly grafted trees despite the use of an extensive fungicide program.

In order to overcome the disease problems changes were made to the original CSIRO technique. These involved moving to more mature shoot material, which was considerably less susceptible to fungal infection, and modifying the graft technique and type in order to accommodate the older thicker scion wood. These changes increased average graft success rates from <10% to around 50%.

The project found no differences in graft success when either H2, the main rootstock used in Australia or Beaumont, the main rootstock used in South Africa, were used as rootstocks for a range of scion cultivars. There were also no differences in graft success, generally around 50%, among cultivars used as scion material when grafted onto H2 rootstock. However, this is a lower average graft success rate than the average 75% success rate encountered in a conventional nursery. While average micro-graft success rates were lower across a range of cultivars the micro-graft success rate, for the conventionally 'hard-to-graft' cultivar A4, were similar at around 50%. Micro-grafting may therefore present a method of improving the graft success rate in these conventionally 'hard-to-graft' cultivars.