

A new approach to virus-free citrus trees

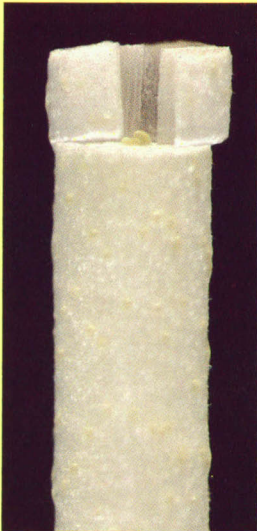
A unique micro-budding technique developed by Luis Navarro, C.N. Roistacher, and Toshio Murashige at the University of California, Riverside, in 1975 has revitalized the citrus industry in the state. The procedure permits horticulturists to go back to the best old-line trees that could not be propagated conventionally because they have become virus-infected, but which still have desirable fruit or other characteristics. Termed shoot-tip grafting, the technique bypasses viruses in infected trees.

It involves grafting a microscopic-size tip, consisting of the leaf primordia and meristem from the very end of a growing shoot of the parent stock, onto a specially conditioned toothpick-size seedling. Performed under aseptic conditions, the technique utilizes growing cells from

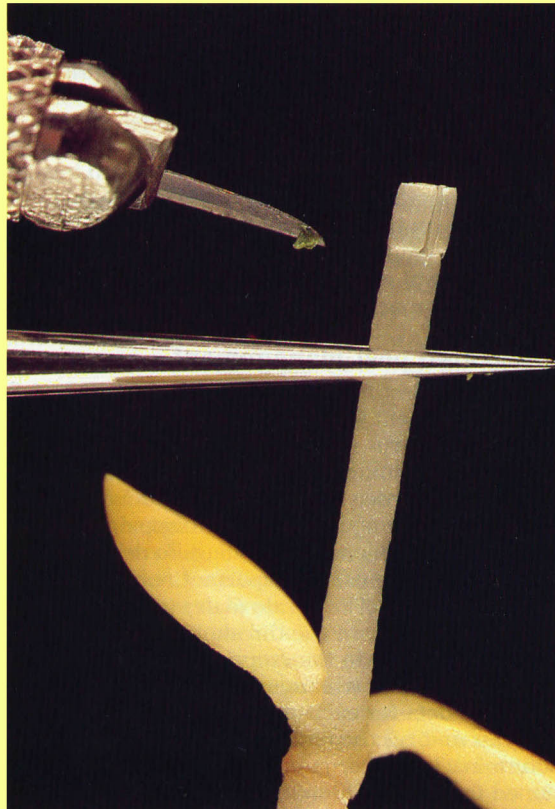
the shoot tip while they are still undifferentiated and before they become a part of the underlying conductive phloem tissue that contains the virus particles.

Two to four weeks after the initial graft, the newly emerged shoot, now established in a test tube, is ready to be regrafted onto a vigorous seedling rootstock in the greenhouse. A year later, after being thoroughly tested for diseases, budwood from the new plant will be available to growers to establish certified disease-free trees.

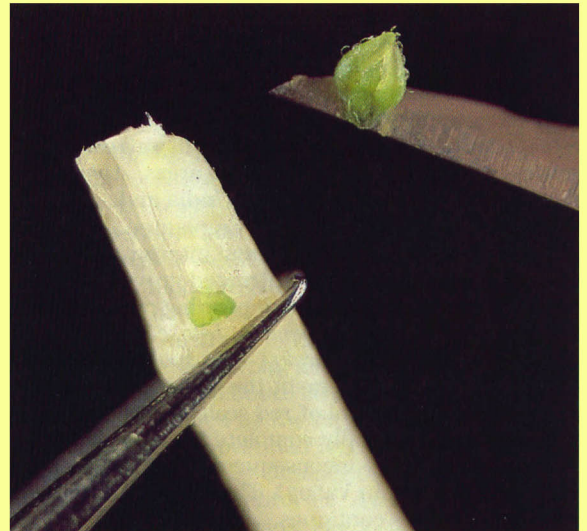
Seventeen selections of virus-free trees developed by the shoot-tip graft technique have been established in the Lindcove Field Station Citrus Clonal Protection Program foundation block.



Specially conditioned seedling, white because it has been grown in the dark to improve receptiveness to graft, ready to receive shoot-tip bud.



Shoot tip, the size of a pinpoint, on end of specially designed knife made from a razor blade, about to be placed in cut on toothpick-size seedling.



Shoot tip in place with another on knife tip for comparison. Procedure is carried out under aseptic conditions with the aid of a binocular microscope.



Two to four weeks later, new shoot has emerged and is ready to be regrafted onto a larger seedling rootstock. In a year budwood will be available for production of field trees.

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