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THE HOT-CALLUSING PIPE

H. B. Lagerstedt, U.S.D.A. Corvallis, OR 97331

There are various problems associated with hot-callusing graft unions of dormant fruit and nut trees. Since the whole plant is exposed to elevated temperatures, growth is promoted not only at the graft union, but also from the scion buds and the roots. Trans-location demands are placed on the graft union once growth of scion buds starts and leafing out occurs. Scion buds and leaves will desiccate if a callus bridge between rootstocks and scion is inadequately formed.

There has never been a simple and successful method for applying heat to the graft union alone. A device that limits the heat to the area of the graft union has now been developed. It is proving successful in rapidly callusing the unions of fruit and nut trees. The device localizes convected, thermostatically regulated air only to the graft union. Scion buds are exposed to ambient air temperature while the root systems of the rootstock is heeled into moist sawdust.

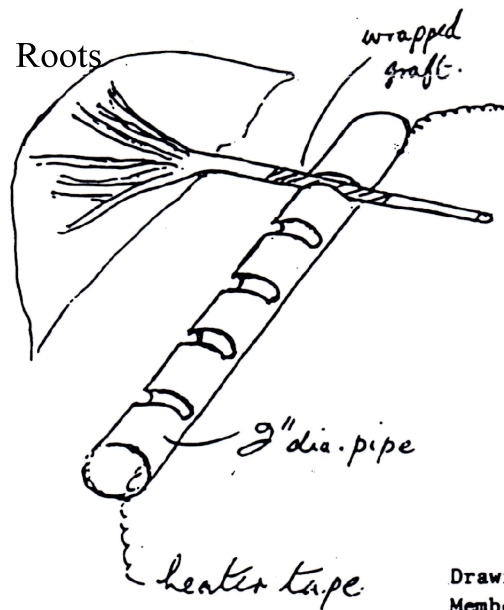
The device is constructed of five cm (two inch) PVC pipe into which 12 mm (1/2 inch) slots have been routed, perpendicular to the length of the pipe. A thermostatically controlled heating cable is placed within the pipe. Graft unions are placed across the pipe in the slots and covered with a ten CM (four inch) wide strip of foam rubber to retard the escape of warm air.

Filbert graft unions callused satisfactorily in 21 to 28 days in the hot-callusing device when air was heated to 27 degrees C (80 F.). The device is simple and inexpensive to construct and relatively trouble-free. Trees can be bench-grafted, handled bare root and do not require greenhouse facilities following grafting. Grafting is done during the dormant season, hence year around labor can be efficiently utilized. The device requires no protective structure. It can be laid out on bare ground or a gravel area and needs only a source of electricity to operate the heating cable.

In the mild winter climate of Oregon's Willamette Valley, hot-callused trees have been lined out directly into the nursery as they are removed from the device. Grafting can begin as soon as rootstocks are dug, about mid-December in western Oregon. The first grafted trees would be ready to plant out the 1st or 2nd week of January. As one group of hot-callused trees is removed from the device, newly grafted trees could take their place. Thus, three or four groups of trees may be cycled through the same device between December and April.

The device was first tested in January 1980 with grafted filbert trees and obtaining 91% tree survival. Two February 1980 grafting trials yielded 82 and 100% success with only 7 survival achieved with a control group that was not hot-callused. In a March trial, 96% success was obtained with hot-callused grafts.

The last 1980 group of hot callused grafts were made April 3, hot-callused only 14 days and set out in the nursery row April 17. Scion buds were growing at this time, yet 77% success was obtained.



Drawing by K. Farrell
Member NAFEX
Oak Ridge, TN

This principle works using modified methods. I successfully calloused persimmon by placing a greenhouse heat pad available at greenhouse supply houses on the floor. The grafted areas placed over the pad and covered with plastic then insulated with sawdust and kept near 80 degrees by thematic control. The roots were off the pad and covered with damp saw dust and kept cold with periodic ice. The roots must be kept in a dormant state while the graft callouses to the understock. These were then planted but could be returned to storage. Jerry Lehman