PROPAGATION OF FILBERT TREES BY MACHINE WEDGE GRAFTING

Filbert trees can now be grafted successfully by using the hot callus treatment (2,3). I am using the Heitz Grafting Tool to make a fast, easy precision wedge graft (1). The desired cultivar is grafted onto 1-0 seedlings with a caliper ranging from ¼ to ⅝ in. Scionwood of any cultivar can be taken from orchard trees rather than wait for a layer bed to be established. Thus a new cultivar with limited scionwood can be brought into production quickly.

LITERATURE CITED

1. Hartmann, H.T. and D.E. Kester. 1983. Plant Propagation: Principles and Practices, 4th ed. Prentice-hall, Inc. Englewood Cliffs, N.J. p. 425.
2. Lagerstedt, H.B. 1981. The hot callusing pipe, a grafting aid. *Ann. Rpt. Northern Nut Growers' Ass'n* 72:27-33.
3. Strametz, J.R. 1983. Hot callus grafting of filbert trees. *Proc. Inter. Plant Prop. Soc.* 33:000-000.

HOT-CALLUS GRAFTING OF FILBERT TREES

JOHN RUSSELL STRAMETZ

Holden Wholesale Growers, Inc.

10734 Hazel Green Road

Silverton, Oregon 97381

The hot-callusing pipe, a grafting aid (1), was first introduced by Dr. H.B. Lagerstedt, U.S. Dept. of Agriculture, Agricultural Research Service, Corvallis, Oregon at the 1981 IPPS Western Region meeting in Vancouver, British Columbia, Canada (2). The first hot-callus pipe was a 2 in. PVC pipe with slots cut in it. Inside the 2 in. pipe, is a ½ in. liquid-filled PVC pipe with heating cables taped onto both sides to maintain 80°F in the hot-callusing pipe.

In August 1981 the first large scale hot callusing pipe was constructed with 1,200 feet of 2 in. PVC pipe and 9,600 ½ in. and ⅝ in. slots cut perpendicular to the pipe. Three slots were cut at one time by clamping three pipes together, and with the use of a radial arm saw containing a variable width dato blade, the slots were uniformly notched.

The heat source for this system is circulating hot water through a ½ in. PVC pipe inside the 2 in. slotted pipe. This is accomplished by using a closed system consisting of a residential 40-gallon gas water heater, ¼ H.P. 1,725 RPM electric circulating pump and a 20-gal. expansion tank placed 6 ft.

above the pump. A 2 in. manifold is used to distribute the hot water to the ½ in. lines inside the slotted 2 in. pipe. This system performs best at 20 to 30 PSI at the pump. The pump is placed on the cool side of the water heater and pushes water through the heater. Temperatures at the heater are 79° to 80°F, going in from the pump, and 81° to 82° F going out to the hot-callus pipe; the temperature is controlled only by the thermostat on the hot water heater. This system has very little heat loss or temperature fluctuation and it operates on less than 2 gallons of propane per day, which makes it far more economical to operate than using electric heating cables.

To attain this efficiency, we placed the complete hot-callus system on redwood furring strips with 1 x 2 in. styrafoam glued to the strips. We then nailed the 2 in. slotted pipe on top. To stop heat loss through the top, a ⅛ in. closed cell foam and a layer of 6 mil black polyethylene was placed over the 2 in. pipe and stapled on each side of the furring strips. A single knife cut was made in the center of each slot in the pipe. We not only benefited from excellent insulation provided by the foam and black poly, but acquired a serviceable means of holding our grafts in the pipe.

With the use of sawdust between the pipes to cover the bare roots, grafted stock is easily and quickly added and removed from the hot-callus pipe. Root moisture is maintained by overhead irrigation of about 5 min. per day.

An unheated fiberglass greenhouse with a concrete floor housed our system. The greenhouse temperatures inside were kept as close to outside as possible except when freezing. After 2 seasons, we feel the best place for a hot-callus pipe system is out-of-doors where the lower temperatures will hold back otherwise premature bud break.

Complete knitting of some *Corylus avellana* cultivar grafts has been obtained in 14 days on seedling rootstocks, but the grafts are usually all left on the hot-callus pipe for 21 days.

Other genera that we have successfully grafted with the aid of the hot-callus pipe are: *Acer*, *Cedrus*, *Cercidiphyllum*, *Fagus*, *Malus*, *Prunus*, and *Sequoia*.

The 80°F temperature is too high for spruce and seems to inhibit healing of the graft union. Temperature in this range on spruce also seems to cause fungus growth between the scion and the understock.

We need much more research in order to establish temperature and cultivar combinations so that the hot-callus pipe may be an even bigger aid than it is already. The future in this field is unlimited.

LITERATURE CITED

1. Lagerstedt, H.B. 1981. The hot callusing pipe, a grafting aid. *Ann. Rpt. Northern Nut Growers' Ass'n.* 72:27-33.
2. Lagerstedt, H.B. 1981. A device for hot callusing graft unions of fruit and nut trees. *Proc. Inter. Plant Prop. Soc.* 31:151-159.

WINTER GRAFTING OF CEDAR, SPRUCE, AND ORNAMENTAL CHERRY

LANCE LYON

Femrite Nursery Company
13193 Arndt Road N.E.
Aurora, Oregon 97002

At Femrite Nursery we graft cedar and spruce in the greenhouse, and cherries in the field.

Production of the grafted conifers begins with the harvesting of the seedling understock. The roots are trimmed and they are potted into 4 in. pots. This is done a year before the grafting is to take place. The understock is left outside until late October and then it is brought into the greenhouse and prepared for grafting.

By December the understock is producing new roots and the scionwood is dormant and is ready to be taken for grafting. We use a side veneer graft for both the cedar and the spruce. First the cuts are made and one edge of the scion is matched to the understock. Then the graft is wrapped with a budding rubber to hold the scion in place and the sides are painted with Tree Heal. The grafts are then placed back on the bench and covered with poly to keep the humidity high until the graft union has time to heal. After about two weeks the poly is removed and the grafted plants are maintained until late spring. At that time the grafts are moved out into shade houses until fall when they are planted in the field.

The Atlas cedar cultivars we graft are *Cedrus atlantica* 'Glauca,' *C. atlantica* 'Glauca Pendula.' Spruce includes *Picea pungens* 'Moerheimii,' *P. pungens* 'Monterey,' and *P. abies* 'Pendula' (weeping Norway spruce). These are generally grown in the field for 4 or 5 years before harvesting.

The ornamental cherries are harvested after a much shorter growing cycle. Mazzard seedlings are planted in the field in April or May, grown through the summer, and some cultivars are budded in September. The following spring the plants are all cut off 6 to 8 in. above the ground. Once the buds begin to grow in the spring a single bud is selected and