FAILURE OF LATE-NOVEMBER SYSTEMIC HERBICIDE TREATMENTS TO CONTROL THE REPLANT PROBLEM

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From November 21 to 28, 1995 a three-acre, 15-year-old planting consisting of almond, prune or nectarine scions all grafted onto Nemaguard rootstock received a variety of systemic herbicide treatments in an attempt to kill remnant roots (1). The purpose of the experiment was to improve herbicide effectiveness through plant manipulations prior to treatment. Because there had not been a killing frost all trees had a full canopy of leaves at time of treatment. The orchard had been irrigated a week prior to the treatments. All herbicide treatments were made within minutes of the sawing of the tree trunks. The main plot consisted of three trunk removal treatments randomized across the different scions. These included: 1) a cut trunk with no scaffolds remaining; 2) a cut trunk with one scaffold remaining; 3) a cut trunk with one scaffold and a thin strip of phloem tissue removed from it using a 1/8" girdling device.

To these main plot treatments we applied by paint brush the following sub plot treatments to the cut trunk:

1) 50 ml Garlon 4E plus 25 ml diesel fuel.
2) 50 ml Garlon 4E plus 25 ml Mor Act.
3) 50 ml Roundup plus 25 ml diesel fuel.
4) 50 ml Roundup plus 25 ml Mor Act.
5) Nontreated check.

The trees were eventually pulled in late January 1996 and half the field replanted to Mission cultivar of almond/Nemaguard in April 1996 and the other half fallowed for one year and then replanted to Mission almond/Nemaguard in March 1997.

In June, August, and October 1996 the remnant roots were randomly examined to 150 cm depth. No treatment produced greater than 25% visually dead roots. Our conclusion is that November applications of systemic herbicides are too late to provide adequate translocation and eventual root kill. Trees replanted in 1997 after one full year of fallowing exhibited extensive replant problem regardless of the treatment. Aboveground portions of the trees are killed with most of these treatments, but adequate root death may not be possible with fall treatments.

Literature Cited:

(1) McKenry, M. V. and T. Buzo. A novel approach to provide partial relief from the walnut replant problem. Proc. Ann. Res. Conf. on MB Alternatives, Orlando, FL. November 4-6, 1996.

(2) McKenry, M., T. Buzo, and S. Kaku. First-year evaluation of tree and vine growth and nematode development following 17 pre-plant treatments. Proc. Ann. Res. Conf. on MB Alternatives, San Diego, CA. November 6-8, 1995.

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