PERFORMANCE OF AGRI-50 AS A NEMATICIDAL ROOT DIP

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One percent Agri-50, a solution of sodium laurel sulfonate amended with colloids and diverse ingredients, was placed in an uncovered petri dish for evaluation of its nematicidal activity. A 3 hr exposure at this dose exhibited dramatic effects on all nematode species tested including: ring, dagger, root knot, root lesion, pin, and stubby root nematodes. Moribund nematodes appear fossilized while in motion. Post-treatment rinsing of the affected nematodes did not result in recovery of their motility. A 0.1% solution for 48 hr exposure had no effect on vermiform stages. The relatively high dose requirement, the steep dosage-response curve, and the relatively safe nature of the product prompted its further evaluation as a root dip for tree and vine nursery crops. Nursery produced grapevines and walnut trees are currently grown in methyl bromide fumigated field soils for one or two years prior to being planted into production fields. It is imperative that nursery plants not be a source of pathogenic nematodes, even when there is no methyl bromide.

We had available dormant rootings of two-year-old Paradox Hybrid walnut trees infected with root lesion nematode, *Pratylenchus vulnus*, and root knot nematode, *Meloidogyne incognita*, as well as one-year-old Ruby Seedless grape also infected with *M. incognita*. Thirty-six of each of these rootings were dug from a field setting and roots were trimmed off each plant at random. A 20 g pre-treatment root sample was placed into a mist chamber for five days of nematode extraction. Immediately after the root sample was collected the entire root systems were immersed in a 1% solution of either Agri-50 or water for 6 or 24 hr. Plants treated with Agri-50 were rinsed in water for 1 hr immediately after their exposure. Prior to planting into a methyl bromide-treated field site root systems were subjected to a post-treatment sampling in the same manner as previously mentioned. The planted trees and vines were observed for phytotoxicity over the next 90 days with none apparent as treated and nontreated rootings grew similarly.

At 90 days after treatment all plants were dug, some roots trimmed from each and placed into the mist chamber for five days. Nematode population levels at pre-treatment, post-treatment and 90 days after treatment are indicated in Table 1.

The data for root lesion nematode indicate a root-penetrating capability. The root knot nematode data indicate that there was a significant difference between plants before treatment due to chance alone. The physical process of digging, washing, and dicing of roots contributes a greater impact on root knot nematode, the eggs of which are primarily external to the root in Ruby Seedless.

An exposure period of 24 hr as a root dip is relatively lengthy. We do not believe that longer exposures would produce nematode-free nursery stock, however these woody rootings handled the treatment well. As a side issue, the dipping solution of 6 liters Agri-50 in 600 liters water was discarded by placement around a one-year-old peach x almond hybrid tree growing in very sandy soil. Treatment to this entire root system without

additional irrigation for 14 days resulted in complete tree death as well as 85% reductions to the soil-dwelling ring nematodes, *Criconemella xenoplax*. Since use of this product requires relatively large treatment amounts it is imperative that the half-life of this product be known. Agri-50 likely has value as a root dip for removal of ectoparasitic nematodes but not endoparasitic nematodes.

Table 1. Evaluation of 1% Agri-50 as a root dip for control of endoparasitic nematodes.

		Paradox Walnut	Ruby Seedless Grape
Treatments	Simple Timing	Root Lesion Nematode/g root	Root Knot Nematode /g of root
Agri-50 1%, 6 hr dip	Pre-treatment	27.89 n.s.	44.13 a
Water only, 6 hr dip		33.97	23.49 b
Agri-50 1%, 24 hr dip		23.50	14.18 b
Water only, 24 hr dip		24.73	9.9 b
Agri-50 1%, 6 hr dip	Post-treatment	7.75 bc	67.78 a
Water only, 6 hr dip		18.12 a	28.97 b
Agri-50 1%, 24 hr dip		2.97 c	33.29 b
Water only, 24 hr dip		11.79 ab	37.20 b
Agri-50 1%, 6 hr dip	90 days post-treatment	86.15 n.s.	45.49 n.s.
Water only, 6 hr dip		61.76	6.82
Agri-50 1%, 24 hr dip		34.02	21.11
Water only, 24 hr dip		48.61	18.84

Average of nine replications. Mean separation by DMRT 5% level.