

Systemic nematicide tested on greenhouse roses

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The root lesion nematode causes a gradual decline and, if uncontrolled, a severe loss in production (quality as well as quantity) of greenhouse-grown roses. The disease progresses gradually; aboveground symptoms include lack of vigor, chlorosis, and generally sparse vegetative growth with shortened blossom stems. Diseased roots may have distinct small brown lesions at first, but these usually expand until they coalesce and the tissue deteriorates.

Previous research, our own as well as that of others, demonstrated that oxamyl (Vydate) adequately controls root lesion nematode (*Pratylenchus vulnus*) on numerous crops, including roses. We began work on large plots to investigate oxamyl dosage rates applied as a soil surface spray, a relatively unproven method. Root lesion nematodes may, under optimum conditions, spend their entire life cycle from egg to adult within the root tissue. Consequently, a systemic nematicide, such as oxamyl, which is absorbed by the roots, theoretically should be the most effective in controlling such a nematode. We measured root lesion nematode control, total yield, and quality of cut roses during a one-year study.

Greenhouse study

We used 'Cara Mia' roses on 'Minetti' rootstocks in a Goleta, California, greenhouse. A pretreatment survey had shown that the soil, a Baywood loamy sand, was uniformly infested with the root lesion nematode. The test site consisted of 12 beds in two houses. Six of

the beds were in their first year of production, and the other six in their fifth year.

Treatments of 0.5 and 1 pound active ingredient per acre of oxamyl, plus a control (water only), were applied monthly for 13 consecutive months at a volume of 60 gallons per acre with a hand-held pressurized sprayer. Immediately after spraying, beds were watered. Plots (one bed each, 5 by 150 feet) were randomized, and treatments replicated four times (two replications per house). Roses received approximately 1.3 inches of water applied weekly through permanent surface sprinklers.

Each month, before the oxamyl applications, soil and root samples were collected from all plots, and populations of root lesion nematode were estimated. Soil was screen-washed, and nematodes were recovered from rose roots by the misting technique. No other plant-pathogenic nematodes were observed in any samplings during the experiment. Crop yields were recorded daily. A quality rating, based on stem length, was made during the peak yield period.

Results

At no time during the experiment was any phytotoxicity observed. Both treatments significantly reduced recoverable lesion nematode populations in soil as well as in roots when compared with the untreated control (fig. 1). There was no significant difference between the oxamyl rates, although the 1-pound rate appeared to maintain a better degree of soil nematode control.

Throughout the experiment, no positive visual improvement was evident as a result of the treatment; however, vigor at the start of the experiment had been satisfactory. Total yields increased in both treatments (8.2 percent at the 0.5-pound rate and 2.6 percent at the 1-pound rate) but were not statistically significant. Quality (higher percentage of longer stems) was also generally improved over the control, but again not to the extent of being statistically significant (fig. 2).

Even though crop differences were not significant, oxamyl applied as a soil-surface spray did produce apparently beneficial responses in yield and quality. The shading that accompanies side beds may have skewed the results to the point where differences were not statistically significant. It would be preferable to eliminate a variable such as the shading factor in future studies investigating the potential of oxamyl.

Our experiment lasted only a year, and it is probable that either of the treatments would have prolonged the productive life of the roses had the trial been extended. Similar control with DBCP, a nematicide no longer available, did prolong rose productivity.

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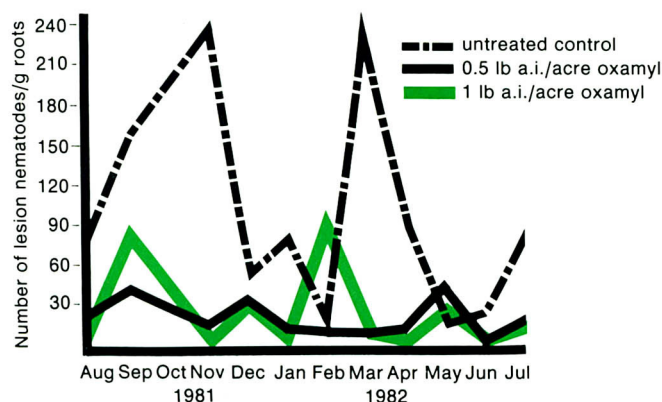


Fig. 1. Both levels of oxamyl treatments significantly reduced recoverable lesion nematodes in the roots.

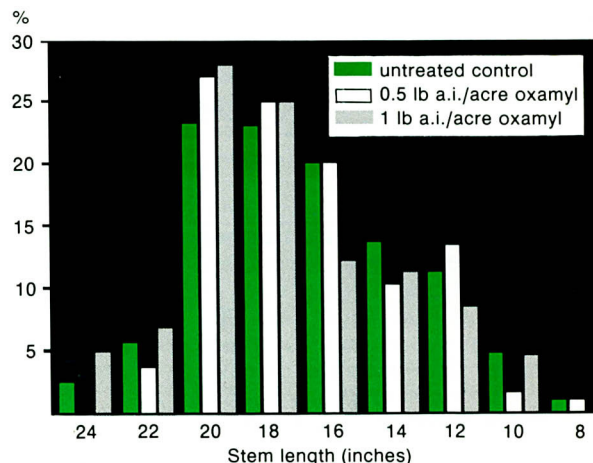


Fig. 2. The nematicide seemed to improve quality (stem length), although differences were not statistically significant.