TARPED METAM SODIUM FOR NEMATODE AND WEED CONTROL IN NURSERIES

B. B. Westerdahl*[1], R. P. Buchner[2], R. Loftus[3], and T. Loftus[3]
[1]Department of Nematology, University of California, Davis, CA, [2]UC Cooperative Extension, 1754 Walnut Street, Red Bluff, CA, and [3]Shasta Nursery, 21008 Dersch Road, Anderson, CA

This research was initiated to determine if multiple depth injections of MS can provide nematode control equivalent to methyl bromide under typical Northern California nursery conditions. Addition of a tarp to multiple depth treatments is likely to improve control of weeds and nematodes in the top few inches of soil. Control may also be extended deeper in the soil. We hypothesize that the "thermal still" action of continuous tarp over moist soil in hot weather may vertically move both the water and layered MS vertically through the soil profile, to the soil surface, and back in thermal cycles.

During the summer of 2001, a trial was initiated in a nursery setting in Malin, OR on 26 July. The trial has 4 replicates of 5 treatments in a randomized block design. The replicated treatments are: (1) untreated, (2) tarped fall methyl bromide, (3) tarped spring methyl bromide, (4) tarped metam sodium, and (5) untarped metam sodium. The metam sodium treatments are 40 gpa injected at the rate of 10 gallons each at 6, 10, 14 and 18 inches with a shank spacing of 7 inches, overlayed with 30 gpa applied via rotatvate and roll to a depth of 6 inches. The methyl bromide treatments are 250 pounds/acre of 99.5%. Plots are 20 feet wide by 40 feet long (including buffer areas). The soil type is a loamy sand (83% sand, 10% silt, and 7% clay with 0.93% stable organic matter). The soil pH is 7.8 to 7.9. Soil temperatures were in the mid-70's at the time of application. Soil moisture ranged from 2-3% at the surface up to 19% at 36 inches. In addition to the replicated treatments, an additional unreplicated 28 treatments were interspersed across the trial area. These additional treatments consisted of Telone II injected at 18 to 20 inches with a shank spacing of 18 inches at either 20 or 35 gpa either alone or in combination with various rates and application methods of metam sodium. Metam sodium and Telone II treatments were applied on 26 July. The untarped treatments received a water seal via overhead sprinklers with 1/8 inch of water applied immediately after treatment, and again at 3 and 6 days following treatment . Fall methyl bromide was applied on 6 August. Spring methyl bromide was applied in the spring of 2002, followed by planting and subsequent monitoring.

Citrus nematode bioindicators and temperature monitors were buried at depths of 2, 8, 14, 20, 26 and 32 inches. Weed tapes provided continuous monitoring from 0 to 32 inches. Free-living nematodes were sampled 3, 6, 12, and 18 inches deep. Soil pH was monitored at 0, 12, 24 and 36 inches deep. Soil moisture was measured at 0, 12, 24 and 36 inches deep prior to metam sodium and Telone II application, prior to fall methyl bromide application, and on 13 August when all bioindicators, weed tapes, and temperature monitors were recovered.

All tarped treatments resulted in 100% control of surface weeds which were mainly lambsquarters. Compared to surface weed control in the untreated, control in the untarped treatments ranged from 95% to 100%.

The weed tapes demonstrated germination from 0 to 32 inches for the untreated and no germination at any depth for the tarped methyl bromide. For the tarped replicated 40 gpa injected, 30 gpa rototilled treatment, 3 of the 4 replicates had some germination starting at the 24 inch depth. The tarped unreplicated 30 gpa injected, 40 gpa rototilled treatment and one of the 40 gpa injected, 30 gpa rototilled treatments had no germination. Comparing the tarped to the untarped metam sodium treatments indicates improved control was provided by the tarp.

In all of the unreplicated treatments, 100% control of citrus nematode was achieved at all depths. For tarped methyl bromide, overall control of citrus nematode was 93.1% with some survival occurring at the 32 inch depth. For tarped metam, overall control of citrus nematode was 81.2% and for untarped it was 73%. For tarped metam, there was some survival at 26 and 32 inches, and for untarped there was survival at all depths except 2 inches, indicating that the use of a tarp provides improved nematode control.

Tarping did not appear to affect the survival of free-living nematodes in either the methyl bromide or metam treatments. A slight reduction was evident in the 0-3 inch depth untreated, tarped treatment.