EVALUATIONS OF PEST CONTROL OVER TWO YEARS IN FIELD POTS

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Field-testing of multiple pests is difficult because the species of interest are often not present in one location. Multiple studies may need to be established to test for all target species. In large field pots using resident soil, many pests can be incorporated into a single test. These pots can then be reused at other sites to evaluate the same pests and pesticides in different soils.

In field pot (76L) studies, three sites were chosen with three different soil types (Yolo sandy loam, 1.08 OM, 42 % sand, 40 % silt and 18% clay-UCD), clay loam (2.66 OM, 17 % sand, 59 % silt and 24 % clay-Rider) and sandy (0.98 % OM, 64% sand, 21 % silt and 15% clay-MBA). Studies were established in the spring of 2000 and 2001. The organisms included in each pot at 5,15 and 30 cm. depth included weed species, field bindweed (*Convolvulus arvensis*), common purslane (*Portulaca oleracea*), little mallow (*Malva parviflora*) and annual bluegrass (*Poa annua*); plant pathogen, *Fusarium oxysporum* 'diantanii' and citrus nematode (*Tylenchulus semipenetrans*). Hybrid Calla lily tubers were placed at the same depths.

Soil temperatures were monitored using Onsett Stowaway microloggers for the duration of the tests. A single layer of Climagro polyethyelene (1.1 mil) was placed over the surface and banded around the edge with rubber bands to hold the poly.

The following treatments and rates were used and replicated four times in a randomized block design. Untreated and covered, propargyl bromide at 25,50,75,100, and 150 lb/A, iodomethane at 150 and 325 lb/a metam sodium at 320 lb/a, and methyl bromide/chloropicrin at 325 lb/A using a 67/33% formulation. At the first site (sandy loam) the metam was treated only from a single depth thus control was not found throughout the container. In all subsequent tests this treatment was split into thirds and applied at all three depths. In the 2001 studies a treatment of furfural/AITC (6%) was added at 400 lb/A at each site. In the first site the pesticide was applied in water at 200 gpa to the surface of the pot and watered in with an additional 0.5 inch of water. In the second (Rider) and third (MBA) study additional water was applied over the furfural/AITC treatments to simulate 1 and 11/2 inches of drip irrigation respectively.

Each study was established for one week before polyethylene tarps were removed. The organisms were removed one day later. The organisms were then taken to the laboratory for viability studies. The tubers were placed in sand in flats in the lathhouse and bud number and tuber viability was evaluated. Soil moisture was evaluated at the end of the

treatment period. The soil moisture ranged from 9 (untreated) to 16% (furfural/AITC) at UCD; 10 to 56% at Rider; and 8 to 23% at MBA. The highest percentages were all from the additional water added as part of the furfural/AITC application.

Results:

In 2000 all citrus nematode and Fusarium were controlled at all rates of propargyl bromide greater than 25 lb/A. Iodomethane and methyl bromide controlled both the nematode and Fusarium at all depths. Metam sodium controlled the two organisms at the 5 and 15 cm depth however small quantities of both organisms survived at 30 cm depth with slightly greater numbers in the clay soil than in the lighter soils. Annual bluegrass, and common purslane control generally followed the same trend. Little mallow seed viability was reduced but not satisfactorily controlled with iodomethane, propargyl bromide and methyl bromide/chloropicrin. Similar results occurred with the control of field bindweed with a maximum control of 29 to 44% depending upon location. Control of weeds was consistently less in the clay loam soil than the other soils. Calla lily tubers were generally controlled with all treatments except propargyl bromide at 25 and 50 lb/A and metham at 320 lb/ A at the 30 cm depth when it was not uniformly applied.

In 2001, the Fusarium control was somewhat more variable than 2000. In the sandy loam site, control was almost complete with all treatments except the furfural/AITC combination. Though the control was greater at 5 cm depth than 15 and 30 cm, similar concentrations of Fusarium was observed with the untreated but polyethylene covered control. In the sandy location propargyl bromide did not give control of Fusarium with 25 lb/A, however, higher rates were effective. In this soil the best results were observed with almost all treatments at 30 and 5 cm depths with a decrease of control at the 15 cm depth. An exception was with the furfural/AITC which gave excellent control at 5 cm but not at the other depths. In the clay loam soil site, iodomethane at 150 lb/A was not effective for Fusarium control. Propargyl bromide, even at 235 lb/A, did not give complete control at the 15 and 30 cm depth. Methyl bromide/chloropicrin and propargyl bromide at 75 lb/A or greater gave excellent control. Furfural/AITC at 400 lb/A gave Fusarium control at the 5 and 15 cm depth, but not at 30 cm.

Weed control followed the trend of control seen in 2000. Annual bluegrass and common purslane were controlled with all treatments, except 25 lb/A of propargyl bromide. Little mallow and field bindweed seedling viability was reduced with propargyl bromide at 75 lb/A or greater, iodomethane at 235 lb/A and methyl bromide/chloropicrin at 325 lb/A. No treatments provided better than 50 % control of these weeds.
Calla lily tubers were controlled with propargyl bromide at 75 lb/A or greater, methyl bromide/chloropicrin, iodomethane at 235 lb/A and metham at 320 lb/A. Furfural/AITC at 400 lb/A did not control the tubers.