ALTERNATIVE CHEMICAL TREATMENTS FOR ORNAMENTAL CROPS.

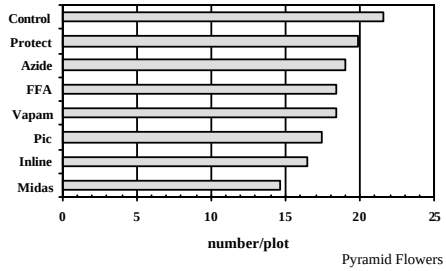
J. S. Gerik, USDA-ARS, Water Management Research Laboratory, Parlier, CA.

Three field trials were established in Oxnard and Carpinteria, CA. to test alternative chemical treatments in ornamental production systems. Treatments at all sites were identical and included the following: iodomethane (30%) + chloropicrin (70%) (Midas, 448 kg/ha Arvesta, San Francisco, CA); Chloropicrin (Tri-Clor EC, 336 kg/ha, TriCal Inc. Hollister, CA); 1,3-dichloropropene (65%) + chloropicrin (35%) (InLine, 577 kg/ha, Dow AgroSciences, Indianapolis, IN); Sodium azide (SEP-100, 112 kg/ha. American Pacific Inc. Las Vegas, NV); Metham sodium (Vapam HL, 477 kg/ha, AMVAC Chemical Inc. Los Angeles, CA); furfural (75%) + allyl isothiocynate (25%) (Multiguard FFA, 672 kg/ha, Harborchem, Cranford, New Jersey); furfural (50%) + metham sodium (50%) (Multiguard Protect, 672 kg/ha, Harborchem, Cranford, New Jersey). All chemicals were applied through the drip irrigation system. At the Oxnard site (Pyramid Flower), treatments were delivered in 2.5 cm of water and at the 2 Carpinteria sites (Hilltop Flowers and Brand Flowers); treatments were delivered in 5 cm of water. Fumigation of the Pyramid Flower site was completed on 14 August 2002, the Hilltop Flower site was completed on 19 November 2002, and the Brand flower site was completed on 4 December 2002. Soil samples were collected from each plot at all 3 sites approximately 3 weeks following the final fumigant application. These soil samples were used to determine population levels of *Pythium* sp., *Phytophthora* sp., and *Fusarium* sp. The Pyramid Flower site was planted with seedlings of *Antirrhinum majus* (snapdragon) 10 days after the final fumigant application. The Hilltop site was planted with seedlings of *Liatris spicata* cv callilepsis (gay-feather) on 30 December 2002. Problems arose with the Brand flower site and the only data collected were from the soil samples. Weed counts were made at the Pyramid and Hilltop sites and weeding times were measured for the Hilltop site. Stem rot, caused by *Sclerotinia sclerotiorum* occurred at the Hilltop site and disease counts were made. The results are presented in the figures that follow. The bars in the figures represent lease significant differences.

No *Phytophthora* sp. were detected at Hilltop or Brand. Most treatments were significantly better than the control for the different parameters measured, but none of the treatments controlled malva, clover or groundsel. *Phytophthora* sp. and *Pythium* sp. were controlled better than *Fusarium* sp. Inline and Midas generally did a good job reducing pathogen populations, but did not reduce the severity of stem rot. More trials are being conducted to further test the efficacy of these fumigants.

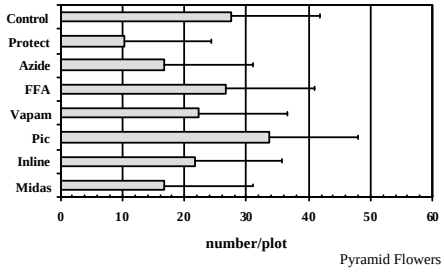
Population of malva on 9/18/2002

No significant difference



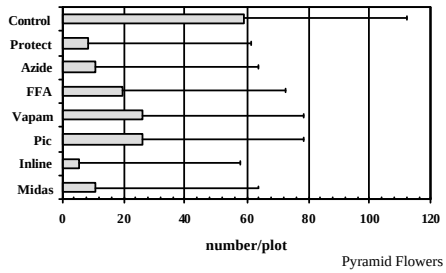
Pyramid Flowers

Population of sowthistle on 9/18/2002



Pyramid Flowers

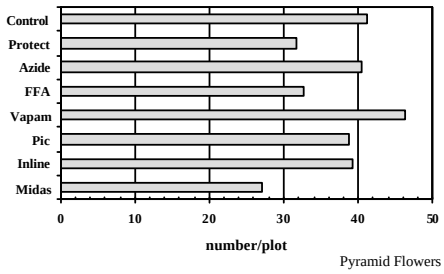
Population of cudweed on 9/18/2002



Pyramid Flowers

Population of clover on 9/18/2002

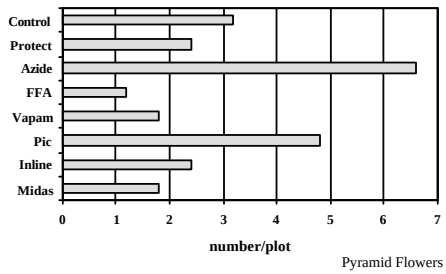
No significant difference



Pyramid Flowers

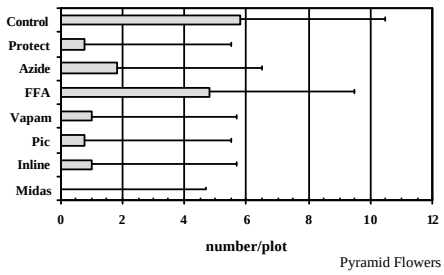
Population of groundsel on 9/18/2002

No significant difference



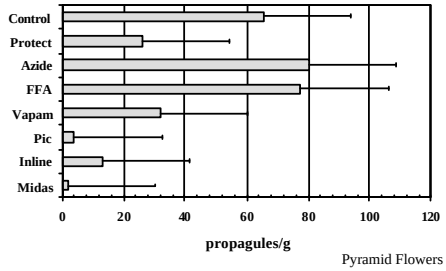
Pyramid Flowers

Population of purslane on 9/18/2002



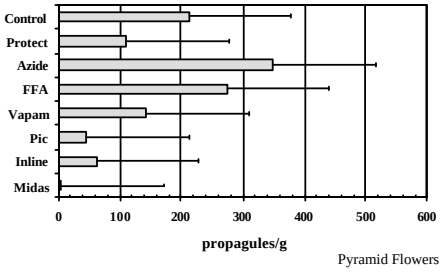
Pyramid Flowers

Populations of *Phytophthora* sp. after treatment



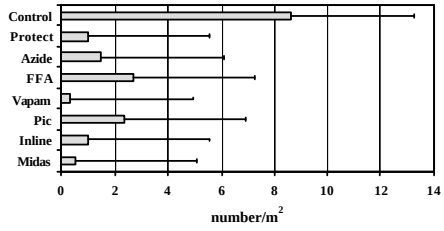
Pyramid Flowers

Populations of *Pythium* sp. After Treatment



Pyramid Flowers

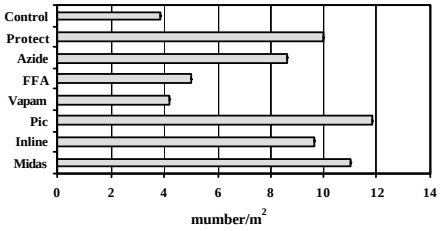
Number of Mustard on 1/24/03



Hilltop Flowers

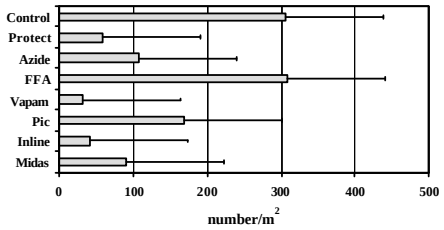
Number of Malva on 1/24/03

no significant difference



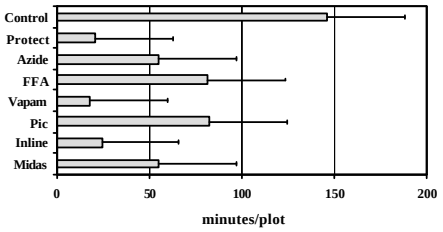
Hilltop Flowers

Number of Knotweed on 1/24/03



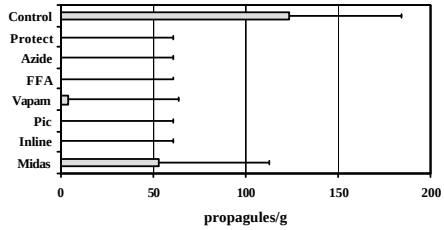
Hilltop Flowers

Weeding Time on 2/6/03



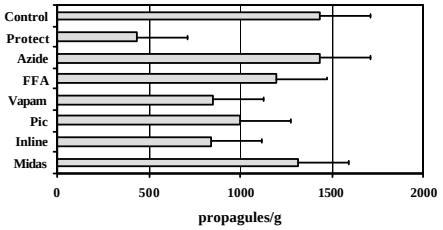
Hilltop Flowers

Populations of *Pythium* after treatment



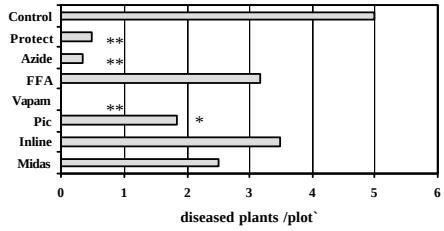
Hilltop Flowers

Populations of *Fusarium oxysporum* after treatment



Hilltop Flowers

Stem Rot Disease Counts on 3/19/03

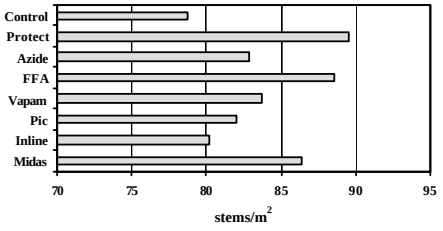


** indicates significant difference from the control $P = 0.05$
* indicates significant difference from the control $P = 0.1$

Hilltop Flowers

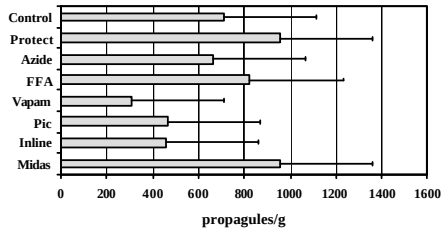
Yield at Harvest

no significant difference



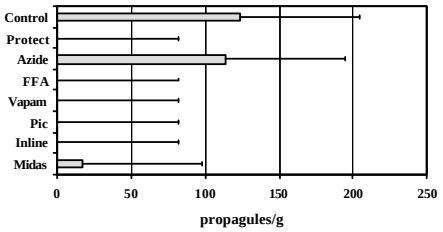
Hilltop Flowers

Populations of *Fusarium oxysporum* after treatment



Brand Flowers

Populations of *Pythium* after treatment



Brand Flowers