PRE-PLANT DRIP IRRIGATION APPLICATION OF 1,3-DICHLOROPROPENE FOR NEMATODE CONTROL IN ANNUAL CROPS

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Twenty-one field studies were conducted in 1994 and 1995 on vegetable crops, nursery crops, and pineapples, comparing drip application of 1,3-dichloropropene (1,3-D) and other products to the standard soil injection methods. Efficacy data are available for several root knot nematodes (Meloidogyne spp.), cyst nematodes (Heterodera spp.), and reniform nematode (Rotylenchulus reniformis). Additional efficacy trials are in progress in 1996.

In the studies reviewed here, drip-applied 1,3-D generally was as effective as the standard soil injection application at comparable rates, and sometimes at much lower rates of active ingredient per unit area. In 12 of the studies, the minimum effective drip-applied 1,3-D rates resulted in 76% to 295% of the yields in the 1,3-D injection treatments, and 123% to 1458% of the yields in nontreated areas. These 1,3-D drip treatment rates were 33% to 66% of the soil injected rates. The best drip-applied 1,3-D treatments resulted in 96% to 309% of the yields in the 1,3-D injection treatments, and 129% to 1526% of the yields in nontreated areas. Drip-applied 1,3-D was not effective in very sandy soils in Florida due to the lack of lateral water movement from the drip tape. More research is needed to improve lateral movement in these sandy soils.

Delivery systems research has identified several hardware configurations that will safely and conveniently deliver 1,3-D through drip irrigation systems, Preliminary air monitoring data indicate that, with a properly installed drip irrigation system, drip application may result in less 1,3-D loss to the atmosphere than standard soil injection application. Studies also are in progress to evaluate the effectiveness of drip-applied 1,3-D for post-plant applications in tree, vine, and nursery crops, and drip-applied 1,3-D/chloropicrin combinations for soil-borne disease control. Drip irrigation application of 1,3-D currently is registered for melons in Arizona, and for several other crops in Europe. Due to the fact that few, if any, new nematicides will be developed in the near future, it is critical that we adapt currently available nematicides to alternative application methods.