PRELIMINARY INVESTIGATION OF ETHANEDINITRILE FOR CONTROL OF WEEDS AND NEMATODES IMPORTANT TO FLORIDA PRODUCTION SYSTEMS

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Background
Previous experiments conducted in Australia with ethanedinitrile have demonstrated control of weeds and diseases of importance to the production of a variety of crops (Ren et al., 2002). Pests included seed and soilborne fungi (Smith et al., 2003) as well as plant-parasitic nematodes. Weed control in these trials was most effective when plots were tarped and was dependent upon species (Mattner et al., 2003; Ren et al., 2003).

Methods
A preliminary in vitro experiment was conducted with seeds of several weed species of importance in vegetable and ornamental production systems in Florida, and with root-knot nematode (Meloidogyne incognita) infested soil.

The prepared weed and nematode inoculum were placed in open desiccators of measured volume, allowed to equilibrate to the test relative humidity, sealed, and injected with a test amount of EDN through a gas septum port, having first withdrawn an equivalent volume of air (Figure 1).

Results

![Figure 1. Weed seeds were placed in a mesh bag (A) and treated within a sealed desiccator (B).](image)

Treatments consisted of an untreated control, 20, 50, and 100 mg ethanedinitrile/L. Sample bags were maintained in chambers for five hours and weed seeds were removed from the bags and allowed to germinate on moistened filter paper in Petri plates within 48 hours of treatment.

Each treatment was replicated three times and a replicate consisted of three test bags containing the following number of seeds or tubers per bag: pigweed (Amaranthus hybridus)-10, portulaca (Portulaca oleracea)-20; sicklepod (Senna obtusifolia)-5; yellow nutseedge (Cyperus esculentus)-5; purple nutseedge (Cyperus rotundus)-5; and large crabgrass (Digitaria sanguinalis)-10.

In addition, 10-g of nematode-infested soil was placed into three 20-um mesh bags per treatment, replicated three times. Following fumigation, the contents of each packet was added to a four-inch pot containing clean sand and peat 3:1. A small depression was made in the sand and contents of the packet were added. One tomato (‘Tiny Tim’) was planted directly into the inoculum from the bag and clean sand:peat was used to fill in the plant hole.

Plants were maintained in the greenhouse for 12 weeks, after which plant growth parameters were taken, nematodes were extracted from roots and soil, and gall ratings were performed. Root galling was assessed using a root gall index based on a scale of 0 to 10, with zero representing no galls and 10 representing severe (100%) galling. Nematodes were also extracted from plant root tissue, counted, and identified.

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