INLINE® FOR SOIL PEST CONTROL IN CENTRAL AMERICA AND MEXICO MELON FIELDS

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The efficacy of InLine® (1,3-Dicloropropene 60.8% + chloropicrin 33.3%) for control of *Fusarium* sp., *Meloidogyne* sp., and *Cyperus rotundus* was assessed from December 1999 to April 2001 as a pre-planting methyl bromide alternative in melons. A total of 11 trials were conducted in Guatemala, Costa Rica, and Mexico. The trials were established as small-area plots where either honeydew or cantaloupe were planted. The General Objectives of the project were: **1.** To determine the optimum rate of InLine® to control soil pests (weeds, nematodes, and soil borne diseases) in melon production areas of Guatemala, Costa Rica, and Mexico. **2.** To determine the feasibility of applying InLine® as a pre-planting soil fumigant in honeydew and cantaloupe as a methyl bromide alternative. The Specific Objectives were: **A.** To compare the efficacy of InLine® against other Methyl Bromide alternatives on weed control and crop production in melons. **B.** To determine the pre-planting interval (PPI) for InLine® on melons under the crop/environmental conditions of Guatemala, Costa Rica, and Mexico. **C.** To determine the control of *Cyperus rotundus* with several rates of InLine®. **D.** To compare several rates of InLine® against the commercial standards, Busan 51.6 SL and Methyl Bromide 100 GA, on purple nutsedge (*Cyperus rotundus*) control and crop production in melons.

The trial locations within and among the three countries were highly diverse, however all locations had a high pest infestation. The soil types in the trials included Clay, Clay Loam, and Loam. The dates when the trials took place were from December 1999 to April 2001 in the three geographical regions. Rates of InLine® tested in this multiple-trial project were 50, 80, 100, 120, 150, 160, 200, 250, and 300 L of InLine® per physical hectare (pha) of melons (1 physical hectare equals 0.5556 hectares of in-bed application). Rates of 200 L/pha and lower were included in trials were the pests to be controlled were *Fusarium* sp. and *Meloidogyne* sp. Rates of 200 L/pha and above were included only where the main target pest was *Cyperus rotundus.* Rates of InLine® were applied to the beds using equipment designed for small area applications. Assessments of pre-planting interval (PPI) were done in trials targeting either *Fusarium* sp. /*Meloidogyne* sp. and *Cyperus rotundus.* Assessments included number of *Cyperus rotundus* plants per 1 m of bed prior to melon harvest, percentage of healthy plants at several days after application, and melon productivity in commercial boxes per ha.

The conclusions of the trials for General Objective **1** and each specific objective are: **A.** InLine® at 250 L/pha and Butrol 37 GE at 250 L/pha were consistently the two best methyl bromide alternatives. InLine® at 250 L/pha outperformed methyl bromide 100 GA at 250 kg/pha and Telone® C-35. **B.** The pre-planting interval (PPI) for melons when using InLine® at 200, 250, and 300 L/pha was determined to be between 6 to 10 days after application. **C.** InLine® at 250 and 300 L/pha had an outstanding control of *Cyperus rotundus* in both, number of plants per meter of bed and in percentage of coverage by the weed. **D.** InLine® at 150 and 200 L/pha performed similar or better in controlling nematodes and soil borne diseases than the commercial standards, Busan 51.6 SL at 200 and 300 L/ha, methyl bromide at 300 Kg/pha, and methyl bromide + Ridomil at 1 L/pha + Tecto at 3 Kg/pha. A dose response was observed when the rates of InLine® were increased from 50 to 200 with a trend towards higher crop production when 150 and 200 L/pha of InLine® were tested in *Fusarium* sp. and *Meloidogyne* sp. infested areas. InLine® at 150 and 200 L/pha also showed the lowest variability across all the trials when tested for *Fusarium* sp. and *Meloidogyne* sp. control. No phytotoxic effects were observed in any trials in direct seeded and transplanted melons from 6 to 30 days after application when using InLine® from 80 to 200 L/pha. The conclusions for General Objective **2** are: InLine® at 250 and 300 L/pha represents a feasible alternative to the use of methyl bromide for *Cyperus rotundus* control; however lower rates of InLine® (150 and 200 L/pha) were able to control only *Fusarium* sp. and *Meloidogyne* sp.