PEST CONTROL WITH DIFFERENT RATIOS OF DIMETHYL DISULFIDE AND CHLOROPICRIN

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The phaseout of methyl bromide (MeBr) continues to stimulate research into the use of other soil fumigants for controlling soilborne diseases and weeds. This research evaluated tomato (*Solanum lycopersicum* L.) tolerance, weed emergence and the recovery of *Fusarium oxysporum* f. sp. *lycopersici* (FOL) inoculum following fumigation with various combination ratios of dimethyl disulfide plus chloropicrin (DMDS + Pic).

Experiments were conducted in the spring and fall of 2017 and the spring of 2018 at the Gulf Coast Research and Education Center (27°N, 82°W) in Balm, Florida. The experiment was conducted as a randomized complete block design with four blocks and twelve treatments. Treatments included DMDS + Pic at 376 + 32, 357 + 63, 337 + 95, 314 + 134, 237 + 254, and 159 + 379 kg ha^{-1}, DMDS alone applied at 396, 376, 357, 314, and 237 kg ha^{-1}, and a nonfumigated control.

Our research showed that the addition of Pic to DMDS improved the control of *C. rotundus*. 159 kg ha^{-1} DMDS + 379 kg ha^{-1} Pic is highly efficacious and provide season-long control of *C. rotundus*. In spring and fall 2017, the DMDS + Pic combinations effectively reduced the recovery of FOL inoculum within buried bags. With higher FOL levels in spring 2018, the DMDS + Pic combinations containing higher proportions of Pic (≥254 kg ha^{-1} Pic) effectively reduced FOL within buried bags.

Overall, results confirmed that DMDS + Pic containing a high proportion of Pic can serve as an efficient MeBr alternative in controlling *Cyperus* spp. and diseases caused by phytopathogenic *Fusarium* species. It would be therefore especially useful in cropping systems where there are no registered pesticides available for *Cyperus* spp. and diseases caused by phytopathogenic *Fusarium* species.