Bioherbicides as Alternatives to Methyl Bromide for Weed Control in Tomato

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Common purslane (*Portulaca oleracea* L.), horse purslane (*P. portulacastrum* L.), ground spurge (*Euphorbia prostrata* L.) and spotted spurge (*Euphorbia maculata* L.) are serious weed pests in commercial tomato [*Lycopersicon esculentum* (Mill.) Swingle] fields in the southeastern U.S. Methyl bromide has been used to control these weeds, but restrictions on usage and eventual EPA banning have resulted in searches for effective alternatives. The bioherbicide *Myrothecium verrucaria* (Alb.& Schwein.) Ditmar:Fr. (*MV*) has shown promise as a bioherbicide for several weeds, such as sicklepod [*Senna obtusifolia* (L.) and kudzu [*Pueraria lobata* (Willd.) Ohwi]Irwin & Barneby). In field tests. Spores of MV were applied postemerggence to natural infestations of purslane and spurge in replicated 1 m^2 test plots located at the Jamie Whitten Delta States Research Center, Stoneville, Mississippi. Treatments consisted of: *MV* only, *MV* in 0.2% Silwet L-77 surfactant, surfactant only, and untreated controls. The treatments were replicated 3 times. Inoculum density of *MV* was approximately 2 x 10^7 spores/ml applied at a spray rate of 500 L/ha. The fungus was highly virulent on all four weed species. After 7 days, the fungus had killed 90-95% of both purslane spp., and 85-95% of spurges. After 14 days, tomatoes (Beefsteak cv.) were transplanted into plots treated with *M. verrucaria.* No visible effects were observed on either of these crops.

In a separate experiment, microconidia, macroconida and chlamydospres of the fungus *Fusarium solani* were applied postemergence to spurge and purslane in field test plots as described previously. Inoculum rates were approximately 2 x 10^7 fungal propagules/ml applied in distilled water at a rate 500 L/ha. After 7 days, the fungus had killed approximately 80% of both purslane species and 75% of common spurge. These results suggest that these pathogens have potential for use as an alternative to methyl bromide for controlling purslane and spurge in tomatoes.