

Evaluation of solarization and Contans WG for control of *Sclerotinia sclerotiorum* in high tunnels, 2006.

This study was conducted in two adjacent commercial high tunnels (20 x 96 ft) with a history of *Sclerotinia sclerotiorum* near Bowling Green, Kentucky. The two tunnels have been used for continuous soil-based mixed vegetable production; one for 6 and the other for 8 years. The grower uses organic management practices, but has not renewed organic certification since 2002. Soil is a silt loam (pH 6.8-7.3, O.M. 1.6-2.0%). Sclerotia of *S. sclerotiorum* were produced in the laboratory on a sterilized mixture of wheat and rye. Mesh bags containing 50 sclerotia were buried 1 and 2 in. below the soil surface (two bags per depth) in the center of 4 x 10-ft plots on 7 Jul 06. Plots were irrigated for approximately 6 hr/wk with three lines of perforated drip tape. Treatments were replicated four times in a randomized complete block design with two blocks of four plots per high tunnel. Two plots per block were covered with transparent 6 mil UV-resistant polyethylene sheets, anchored by burying the edges with soil. Polyethylene was removed on 28 Aug, after 52 days of solarization, and all bags of sclerotia were retrieved. Contans WG was dissolved in 0.5 gal of water per plot, applied to the bed surface at 6 lb/A with a backpack sprayer, and immediately incorporated to a depth of approximately 1 to 2 in. by raking on 28 Aug. Plots not treated with Contans WG were also sprayed with 0.5 gal of water and raked. One bag of sclerotia was replaced at each depth, and retrieved 112 days later on 18 Dec. The number of intact sclerotia in each bag was recorded after August and December collections. Sclerotia collected in December were washed, surface sterilized, and rinsed in distilled water before aseptic transfer into Petri dishes containing a sterilized 1:1 soil:sand mix. The number of sclerotia exhibiting carpogenic germination was recorded after 6 weeks of incubation at 60 °F and a 12:12 day:night photoperiod.

Solarization reduced survival of *S. sclerotiorum* sclerotia but Contans WG did not. Burial depth did not affect sclerotial survival. Apothecial germination was only observed in sclerotia not subject to solarization. These data support the hypothesis that summer solarization is an effective means of reducing *S. sclerotiorum* survival in high tunnels. The tactic is compatible with organic production systems, but requires that beds be taken out of summer production for treatment. We found no evidence that Contans WG reduced *S. sclerotiorum* survival under the conditions tested. Excessive heat at the time of application or insufficient incorporation into soil may have contributed to the lack of efficacy of Contans WG.

Treatment	No. intact sclerotia/bag (max. 50)				No. germinating sclerotia/bag	
	28 Aug.		18 Dec.		1 in.	2 in.
	1 in. ^x	2 in.	1 in.	2 in.		
Solarization.....	0.5 b ^y	10.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Contans WG.....	50.0 a	48.8 a	40.0 a	35.8 a	27.3 a	24.8 a
Solarization, then Contans WG	3.0 b	9.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Untreated control.....	40.8 a	48.5 a	8.0 b	20.8 a	8.0 b	15.3 ab
LSD ($P = 0.05$) ^z	13.9	16.0	12.0	17.9	15.0	17.1

^x Burial depth of mesh bags containing sclerotia

^y Values are the means of four replicate plots; treatments followed by the same letter within a column are not significantly different at $P \leq 0.05$.

^z Least Significant Difference at $P = 0.05$. Values in each column differing by more than the least significant difference are significantly different from each other according to Fisher's Protected LSD test.