

Evaluation of chemical control of white mold on snap bean - Hancock, 2007.

A trial to evaluate the efficacy of chemical and biological products to control white mold on snap bean was established 28 Jun at the Hancock Agricultural Research Station, Hancock, WI. Each plot consisted of four 21-ft-long rows, spaced 16-in.-apart and planted with seeds of cultivar Trueblue (Harris Moran), at approximately 10 per ft. There were four replications and plots were arranged in a randomized complete block design. Drive rows were placed adjacent to plots to minimize damage to plants in treatment rows. Soil type was Sparta loamy sand with pH 7.2. Sunflowers were planted in this field in 2006 and the flowers were inoculated with *Sclerotinia sclerotiorum*. Infected debris and sclerotia were tilled into the soil in the fall of 2006 and apothecia produced from these sclerotia provided a natural source of ascospore inoculum for this experiment. The field was fertilized with preplant broadcast application of 0-0-60 (300 lb/A, 3 Apr), 5-10-30 (100 lb/A, 27 Jun) and sidedress applications of 46-0-0 (50 lb/A, 24 Jul and 5 Aug). Dual II Magnum (1.5 pt/A, 29 Jun) and Basagran (1.0 pt/A, 25 Jul) plus Crop Oil Concentrate (1 pt/A, 25 Jul) were applied for weed control. Admire Pro incorporated in the fertilizer applied at planting (1.5 fl oz/100 lb) and Capture 2EC (2.0 fl oz/A, 7 Aug) were used for insect control. Experimental fungicide treatments were applied to all four rows of each plot with a plot sprayer using a tractor-mounted boom pressurized with an air compressor. Treatments were applied at a rate equivalent to 35 gal water/A at 40 psi, using Tee Jet Hollow Disc Cone D3-23 nozzles (8 nozzles at 8-in. spacing). Application dates were: 6 Aug (10% bloom); 10 Aug (10% bloom + 4 days); 13 Aug (10% bloom + 7 days). On 27 Aug, two 5-ft sections from each plot were rated for disease severity and pod infection. The disease severity and the number of infected pods was determined for each of these plants. The two center rows of each plot (a total of 32 ft of row remaining) were mechanically harvested on 28 Aug and pods were graded to determine proportion of yield in different size classes based on pod diameter: 1-3 (< 0.35 in. diam), 4 (> 0.35 in. but < 0.43 in.) and 5 (> 0.43 in.). Rainfall recorded during the growing season (in.) was Jun (1.11); Jul (2.46) and Aug (7.93). An additional 9.5 in. of water was applied as overhead sprinkler irrigation in 19 applications (26 Jun – 16 Aug).

Weather conditions during the bloom period were not conducive to bloom infection or subsequent disease spread. Thus disease severity, incidence of infected plants and the number of infected pods was very low. Differences between treatments were low and non significant. Yields were variable among replicates and differences between treatments in yield, crop value and economic effects of treatment on crop value were not statistically significant.

Table 1. Effect of treatment on incidence and severity of white mold on snap beans.

Treatment and rate - formulated product	Number of sprays & application schedule	Disease severity (%) ¹	Incidence of infected plants ²	Avg. no. infected pods/plant	% of plants with infected pods/plant				
					0	1	2	3	≥ 4
Untreated Control		0.4	2.4	0.01	99.1	0.9	0.0	0.0	0.0
Topsin-M 70WDG, 1.5 lb	1, 10% bloom + 4 days	0.5	5.2	0.03	96.9	2.7	0.4	0.0	0.0
LEM17 SC (200 G/L), 9.5 fl oz	2, 10% bloom and 10% + 7 days	0.0	0.4	0.00	100.0	0.0	0.0	0.0	0.0
LEM17 SC (200 G/L), 14.3 fl oz	2, 10% bloom and 10% + 7 days	0.1	0.9	0.01	99.5	0.0	0.5	0.0	0.0
LEM17 SC (200 G/L), 20.5 fl oz	2, 10% bloom and 10% + 7 days	0.7	1.7	0.02	98.9	0.6	0.5	0.0	0.0
LEM17 EC (200 G/L), 9.5 fl oz	2, 10% bloom and 10% + 7 days	1.4	5.2	0.00	99.6	0.4	0.0	0.0	0.0
LEM17 EC (200 G/L), 14.3 fl oz	2, 10% bloom and 10% + 7 days	0.0	0.0	0.00	100.0	0.0	0.0	0.0	0.0
LEM17 EC (200 G/L), 20.5 fl oz	2, 10% bloom and 10% + 7 days	0.2	1.3	0.01	99.1	0.4	0.4	0.0	0.0
Endura, 8 oz	2, 10% bloom and 10% + 7 days	0.1	0.9	0.01	99.1	0.4	0.4	0.0	0.0
Cuprofix Dispers Ultra 40%, 1.25 lb	2, 10% bloom and 10% + 7 days	0.7	3.7	0.02	98.0	2.0	0.0	0.0	0.0
Serenade MAX, 1.0 lb + Endura, 4.0 oz	2, 10% bloom and 10% + 7 days								
+ Biotune 1 pt/100 gallons		0.1	0.9	0.02	99.1	0.4	0.0	0.0	0.0
Serenade MAX, 1.0 lb + Topsin M, 1.0 lb	2, 10% bloom and 10% + 7 days								
+ Biotune 1 pt/100 gallons		0.0	0.5	0.00	99.5	0.5	0.0	0.0	0.0
Topsin-M, 1.0 lb	2, 10% bloom and 10% + 7 days	0.6	1.9	0.02	98.1	1.5	0.4	0.0	0.0
Contans, 2.0 lb	1, 10% bloom + 4 days	0.1	0.8	0.01	99.2	0.8	0.0	0.0	0.0
Contans, 2.0 lb	2, 10% bloom and 10% + 7 days	0.1	1.3	0.02	98.7	0.9	0.0	0.0	0.0
<i>P</i> > <i>F</i> ³		0.73	0.75	0.76	0.60	0.52	0.82	0.47	---
LSD		NS	NS	NS	NS	NS	NS	NS	---

1 A ten-foot section of row was rated in each plot. Severity of disease on the entire plant was estimated for each plant on a 0-10 scale (0 = no infection, 1 = 10% infected, 2 = 20% infected, . . . 10 = 100% infected). Numbers are the means of all plants rated (expressed as percentages).

2 The percentage of plants (out of the 10 ft of row rated) with any level of infection.

3 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at *P* = 0.05.

Table 2. Effect of treatment on yield and value of snap beans.

Treatment and rate	Number of sprays & application schedule	Total yield (ton/A)	% of yield in size class ¹					Cost of chemicals (\$/A) ²	Gross value of yield (\$/A) ³	Net value of yield (\$/A) ⁴	Effect of treatment on value (\$/A) ⁵
			1-3	4	5						
Untreated Control		1.8	27.1	42.4	30.6	0	160	160	0	0	
Topsin-M 70WDG, 1.5 lb	1, 10% bloom + 4 days	2.6	21.8	36.4	41.8	---	220	220	---	---	
LEM17 SC (200 G/L), 9.5 fl oz	2, 10% bloom and 10% + 7 days	2.4	23.0	35.1	41.9	---	206	206	---	---	
LEM17 SC (200 G/L), 14.3 fl oz	2, 10% bloom and 10% + 7 days	2.2	21.0	37.3	41.7	---	194	194	---	---	
LEM17 SC (200 G/L), 20.5 fl oz	2, 10% bloom and 10% + 7 days	2.0	28.1	41.6	30.3	---	188	188	---	---	
LEM17 EC (200 G/L), 9.5 fl oz	2, 10% bloom and 10% + 7 days	1.8	21.0	35.3	43.6	---	149	149	---	---	
LEM17 EC (200 G/L), 14.3 fl oz	2, 10% bloom and 10% + 7 days	2.1	24.9	35.9	39.2	---	186	186	---	---	
LEM17 EC (200 G/L), 20.5 fl oz	2, 10% bloom and 10% + 7 days	2.5	26.1	40.0	33.9	---	227	227	---	---	
Endura, 8 oz	2, 10% bloom and 10% + 7 days	1.9	22.9	37.1	40.0	58	171	113	-47	-47	
Cuprofix Dispers Ultra 40%, 1.25 lb	2, 10% bloom and 10% + 7 days	2.5	23.1	34.0	42.9	9	212	203	43	43	
Serenade MAX, 1.0 lb + Endura, 4.0 oz	2, 10% bloom and 10% + 7 days										
+ Biotune 1 pt/100 gallons		1.9	28.7	40.3	31.1	54	171	117	-43	-43	
Serenade MAX, 1.0 lb + Topsin M, 1.0 lb	2, 10% bloom and 10% + 7 days										
+ Biotune 1 pt/100 gallons		2.8	22.1	34.2	43.8	57	236	179	19	19	
Topsin-M, 1.0 lb	2, 10% bloom and 10% + 7 days	2.5	23.1	36.0	40.8	32	212	181	21	21	
Contans, 2.0 lb	1, 10% bloom + 4 days	2.3	24.5	33.4	42.1	30	192	163	3	3	
Contans, 2.0 lb	2, 10% bloom and 10% + 7 days	2.5	25.1	36.2	38.7	59	215	156	-4	-4	
<i>P</i> > <i>F</i> ⁶		0.35	0.77	0.02	0.16	---	0.44	0.28	0.28	0.28	
LSD		NS	NS	5.3	NS	---	NS	NS	NS	NS	

1 Size classes based on bean pod diameter: 1-3 (< 9 mm diam), 4 (> 9 mm but < 11 mm) and 5 (> 11 mm).

2 Season-long cost of chemicals/acre (rate, number of applications and retail cost are included in calculation, cost of application is NOT included). Sample retail prices used include: Biotune, \$36.00/gal; Contans, 14.75/lb; Cuprofix, 3.75/lb; Endura, 3.60/oz; Serenade, 11.00/lb; TopsinM, 15.75/lb. LEM17 SC and LEM17 EC are experimental products with no price information available.

3 Comparison based on a typical 2004 contract price for W1 processing beans. Contract was based on actual amount harvested in each sieve size class – total yield was multiplied by the percentage of yield in each size class. The portion of yield in size 1-3 received \$113/ton; size 4, \$101/ton; size 5 \$59/ton.

4 Gross value minus cost of chemicals applied (calculated only for treatments with known chemical cost).

5 Effect of treatment on value = Net value for the treatment minus net value of the untreated control.

6 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at *P* = 0.05).

