

**REPORT TO THE AGRICULTURAL RESEARCH FOUNDATION
FOR THE OREGON PROCESSED VEGETABLE COMMISSION
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Project Title: Ascospore Trapping of *Sclerotinia sclerotiorum* in Snap Bean Fields

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Background and Justification: A detection assay specific to *Sclerotinia sclerotiorum*, the causal agent of white mold, has been developed using polymerase chain reaction (PCR). This technique has been used by Gent to detect ascospores on glass rods in the laboratory. If ascospores of *S. sclerotiorum* can be detected in bean fields then development of ascospore monitoring and a subsequent predictive model can commence. Knowing if and when ascospores are present would enable better timing of protective fungicides. If absence of ascospores could be reliably determined then a single-spray program for white mold control could be utilized with less risk, and perhaps even a no-spray program could be recommended.

Objective for 2008 and Accomplishments: The purpose of this proposed research is to determine whether ascospores of *S. sclerotiorum* can be detected in experimental bean plantings by PCR.

The snap bean variety '91G' was planted at two different sites of Chehalis silt loam soil on the OSU Botany Farm. Sclerotia of *S. sclerotiorum* were added to both fields during 2007 and 2008. Each field was split into two plantings of '91G' snap beans and were sown approximately two weeks apart. Plantings 1 through 4 established June 16th, July 2nd, July 17th and August 8th using a 15-in. row spacing and approximately 206,000 seeds/A. 400 lb/A of 12-29-10-8 fertilizer was banded at planting followed by 100 lb/A of 40-0-0-6 banded at the second to third trifoliolate leaf stage. Eptek 7EC (3.5 pt/A) and Trifluorolin (0.5 pt/A) were broadcast and incorporated 4 days before planting; Basagran (2 pt/A) and Poast (2 pt/A) were applied 24 days after planting. Asana XL (8 oz/A) was applied one week after 10 % bloom for control of cucumber beetles. The field was sprinkler-irrigated weekly with 1 to 1.5 in. of water. Rotorod spore traps were moved among plantings 1, 3, and 4 in order to monitor at a minimum just prior to 10 % bloom through the following 3 weeks in each planting. Rods were replaced every 48 hours, and subsequently tested for the presence of ascospores using polymerize chain reaction technology (PCR) specific to the pathogen. Environmental data was collected from three different weather monitoring devices.

Spores of *S. sclerotiorum* were detected on 29 of 67 rotorod samples. When both spore traps were located within the same planting, there was only one sampling time when samples from both spore traps tested positive for ascospores (Table 1). Ascospores were also detected in samples of the two later bean-plantings (Table 2). Ascospores were detected on samples placed out in the field 6 days prior to 10% bloom in the first planting, reinforcing the importance of protecting early blooms when there is white mold pressure. These findings illustrate that rotorod spore trapping with subsequent PCR testing can detect ascospores of *S. sclerotiorum* in the field. The successful detection of ascospores in the field indicates a potential to monitor and potentially

predict ascospore release. Better timing of fungicide applications maybe possible. However, given that spores were usually only detected from one spore trap and not both traps in planting #1, more research is needed on trap placement for reliable detection of ascospores.

Table 1. 2008 ascospore detection of *Sclerotinia sclerotiorum* by two different rotorod traps placed in the same bean planting at the OSU Botany and Plant Pathology farm

Planting #	Date in	Ascospore detection	
		Trap 1	Trap 2
1	15-Jul	0	0
1	19-Jul	0	0
1	22-Jul	0	1
1	24-Jul	1	0
1	26-Jul	0	1
1	28-Jul *10% bloom	0	0
1	30-Jul	0	0
1	3-Aug	0	0
1	5-Aug	0	0
1	7-Aug	0	0
1	9-Aug	0	0
1	11-Aug	1	0
1	13-Aug	0	1
1	15-Aug	0	1
1	17-Aug	0	0
1	19-Aug	0	1
1	21-Aug	1	1
1	23-Aug	0	1
1	25-Aug	1	0
1	27-Aug	1	0

Table 2. 2008 ascospore detection of *Sclerotinia sclerotiorum* by rotorod traps in bean plantings 3 and 4 at the OSU Botany and Plant Pathology farm

Planting #	Date in	Ascospore detection	Planting #	Date in	Ascospore detection
3	29-Aug	1	4	12-Sep	0
3	31-Aug	1	4	14-Sep	0
3	2-Sep	0	4	16-Sep	1
3	4-Sep	1	4	18-Sep	0
3	8-Sep	0	4	20-Sep	1
3	10-Sep	1	4	22-Sep	1
3	12-Sep	1	4	22-Sep	0
3	14-Sep	1	4	26-Sep	0
3	16-Sep	0	4	26-Sep	1
3	18-Sep	1	4	30-Sep	1
3	20-Sep	1	4	2-Oct	1
			4	4-Oct	1
			4	6-Oct	1
			4	8-Oct	0