

**REPORT TO THE AGRICULTURAL RESEARCH FOUNDATION  
FOR THE OREGON PROCESSED VEGETABLE COMMISSION, December 2012**

**Project Title:** Mold Management in Snap Bean

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**Background and Justification:** *Sclerotinia sclerotiorum* (causal agent of white mold) can cause serious economic losses in snap bean production as well as many other crops. Spores are produced in apothecia (mushroom-like structures) that develop from over-wintering sclerotia in the soil. Sclerotia are long-lived, durable hyphal survival structures produced by the fungus and they can survive up to eight years between hosts. Recent cool, wet growing seasons have promoted white mold disease and Ocamb has observed white mold epidemics in a number of fields where disease exceeded 10% incidence (snap bean, bell pepper, cauliflower, winter squash, and experimental canola fields). Gray mold (*Botrytis* sp.) can also infect bean, but usually occurs at very low levels in fungicide trials (<0.5 % plant incidence) on the OSU-BPP Farm and its presence on a plant is usually preceded by white mold.

Since the loss of the Ronilan label, snap bean mold efficacy trials have been conducted on the OSU-Botany and Plant Pathology Farm examining registered and experimental materials. Currently registered fungicides for snap bean mold control include thiophanatemethyl formulations (Topsin M 70WP, Topsin 4.5FL, and T-Methyl 4.5F AG), iprodione formulations (Rovral 4F, Nevado 4F), carboxamide formulations [Endura (boscalid) and Fontelis (penthiopyrad)], Switch 62.5WG (fludioxonil plus cyprodinil), Cannonball (fludioxonil), and Omega 500F (fluazinam). Thiophanatemethyl controls white mold well but has little effect on gray mold because many gray mold strains are resistant to this active ingredient. Iprodione controls both gray mold and white mold. Endura (boscalid) and Switch 62.5WG (fludioxonil plus cyprodinil) are both newer materials that have shown good efficacy on white mold in field studies conducted by OSU but relatively little is known about Fontelis or Cannonball for bean mold of snap bean fields in the Pacific Northwest .

**Objective for 2013:** Compare the efficacy of fungicides in a 2-spray program on mold in snap bean

- *White mold developed to severe levels (15% pod incidence) in the nontreated plants in the second field planting while relatively low levels of gray mold appeared. Differences were seen in pod and stem infections among some of the 8 treatments evaluated.*

The snap bean cultivar '91G' was planted on 6 Jul 2013 in Chehalis silt loam soil at the OSU Botany Field Laboratory in Corvallis. The trial was planted using 19-in. spacing between rows with approximately 206,000 seeds/A. Fertilizer (400 lb/A of 12-29-10-8 of N-P-K-S) was banded at planting followed by 100 lb/A of 40-0-6 banded at the second to third trifoliolate leaf stage on 6 Aug. Lorsban Advanced at 2 pts/A was applied two days prior to sowing for insect control. For weed control, Eptam 7E (4.5 pints/A) and Treflan 4L (2 pints/A) were applied prior to planting, followed by Raptor (4 oz/A) + Basagran (16 oz/A) when snap beans reached the first to second trifoliolate leaf stage. The field was sprinkler-irrigated weekly as needed with 1 to 1.5 in. of water. Four-row plots, each 5 ft by 18 ft, were arranged in a randomized complete block design with three replications. Fungicides were applied at 10% bloom (14 Aug) and repeated a

week later (21 Aug) using a CO<sub>2</sub> backpack sprayer calibrated to deliver 22 gal of water/A at 38-40 psi using three 8002 flat fan nozzles on 19 in. spacing. On 5 Sep, the number of pods as well as the presence of white or gray mold on pods  $\geq$  2 in. in length and stems were determined for 30 individual plants selected arbitrarily from the center row of each plot.

High levels of white mold were found in this trial. White mold was observed on 15% of the pods per plant in the nontreated control plots while gray mold was found at much lower levels ( $\leq$  1 % pod incidence per plant). The percentage of infected pods  $\geq$  2-in. in length and number of stems affected by white mold were lower in most of the fungicide treatments compared to the nontreated control. The tank mix of Topsin + Rovral was numerically the best in terms of controlling white mold on pods but was statistically equivalent to Omega and Cannonball. Treatment with Endura, Switch, Fontelis, or Regalia + Topsin were inferior compared to Topsin + Rovral at managing white mold on pods under this high disease pressure, but offered improvements in pod disease control compared to the nontreated plots., though Fontelis was associated with a high level of pod infections. The average number of white mold stem hits was lowest in the tank mix of Topsin + Rovral as well as Cannonball and one Omega treatment. The levels of gray mold on pods was overall low but Fontelis and Cannonball at the rates tested, appeared inferior to the other materials, except Switch, on gray mold. The number of healthy, marketable-size bean pods was greatest in the tank mix of Topsin + Rovral as well as Omega at the top rate while the lowest numbers were observed in the nontreated water control and Cannonball. Phytotoxicity was not observed with any treatments examined in this trial.

**Table 2.** Treatments applied at 10 & 100 % bloom to snap bean '91G and results from Field 2

Fungicide Treatment (rate/acre) <sup>z</sup>	Avg. # healthy pods per plant		% pods with white mold <sup>y</sup>		% pods with gray mold <sup>y</sup>		Avg. # stems with white mold <sup>y</sup>	
nontreated (water control)	10	de	15	a	0.1	c	3.6	a
Rovral 4F (2 pt) + Topsin 45FL (30 fl oz)	15	a	2	f	0.2	bc	1.0	e
Endura 70WG (8 oz) + JMS Stylet Oil (0.5 gal)	11	cd	6	cde	0.0	c	1.6	d
Switch 625WG (11 oz)	13	b	7	c	0.9	ab	2.3	b
Omega 500F (13.6 fl oz)	15	a	4	def	0.1	c	2.2	bc
Omega 500F (8 fl oz)	12	bc	3	ef	0.2	bc	0.8	e
Regalia (2 qt) + Topsin 45FL (30 fl oz)	13	b	7	cd	0.1	bc	1.9	cd
Fontelis (30 fl oz)	11	cd	10	b	1.1	a	1.7	d
Cannonball WP (7 oz)	9	e	5	cdef	1.1	a	0.9	e

<sup>z</sup> 10% and 100% bloom applications were made on 14 Aug and 21 Aug, respectively.

<sup>y</sup> Means are based on the % pods or number of stems per plant with mold. Means within a column followed by the same letter are not significantly different at  $P = 0.05$  by Fisher's protected LSD test.

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