EVALUATION OF FUNGICIDES FOR CONTROL OF *BOTRYTIS ALLII* IN SEED ONIONS, 1994-1995

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Abstract

Evaluations of a single fall and two spring fungicide applications for control of *Botrytis allii* were conducted in a commercial field of seed onions near Madras, Oregon. Fungicides evaluated include thiophanate methyl (Topsin M, Elf Atochem), iprodione (Rovral, Rhone-Poulenc), vinclozolin (Ronilan, BASF), metalaxyl, chlorothalonil (Ridomil / Bravo, Ciba), TD2350 (Elf Atochem), and CGA-219417 (Ciba). Split-plots were used, with half the plants grown from Topsin M-treated seed and the other half grown with non-treated seed. Topsin M, TD2350, and a combination of the two consistently provided the greatest control. Rovral, Ronilan, Ridomil / Bravo, and CGA-219417 did not provide adequate control of the disease.

Introduction

Vegetable seed production is an integral part of agriculture in central Oregon with near 5,000 acres of production, and a yearly income of $12 million. Onion seed, which includes mostly hybrid varieties, is produced on about 500 acres with a gross return near $2 million. One of the major pests on seed onions is *Botrytis allii,* which attacks onions on the bulb near the soil surface, on the scape, and potentially florets and seed in the umbel. Some varieties appear to be more susceptible to the fungus, which can substantially reduce stands and seed yield.

Methods and Materials

Fungicides evaluated for control of *Botrytis* on seed onions include Topsin M (1 lb/a and 2 lb/a), Rovral (2 lb/a), Ronilan (2 lb/a), Ridomil / Bravo (1 lb/a), CGA-219417 (2/3 lb/a), TD2350 (1 lb/a), and Topsin M (1 lb/a) plus TD2350 (1 lb/a). The study was conducted on a commercial field of hard yellow females and Spanish males (S & L Farm) on the Agency Plains near Madras, Oregon. The 10 ft x 25 ft split-plots were replicated three times in a randomized complete block design, with half the plot planted with Topsin-M-treated seed prior to planting. Fungicides were applied with a CO_2 pressurized, hand-held, boom sprayer with twin-jet 8004 nozzles at 40 psi with 40 gal/a of water. Silwet L-77 at 8 oz/100 gal and R-56 at 1 qt/100 gal was added to all treatments. The fall application was made on September 30, 1994, followed by two spring applications on May 3, and May 13, 1995.

Stand counts were made to determine the extent of winter kill, with pre-counts on November 4 and 6, 1994, and post-counts on April 21, 1995. To determine the percentage of bulbs infected with *Botrytis,* 3 feet of row from untreated seed plots were removed and bulbs examined for lesions and sporulation on June 15-19, 1995. Thirty-plant samples were taken from both plots of treated seed and untreated seed for a second evaluation on July 17-21, 1995. *Botrytis* was considered present if lesions plus sporulation were present on the bulb at the time of sampling, or if sporulation developed within 3 days of storage in plastic bags at

room temperature. A visual rating of percent plants with adequate root systems to remain standing was made on July 24, 1995. No evaluation of scape blight was conducted because of relatively little scape blight and a reduced stand due to destructive sampling.

Results and Discussion

There were no significant differences between fall and spring stand counts, or between treated and untreated seed without fungicide applications. The early evaluation of fungicide treatments to plots with untreated seed on June 15-19 indicates the numbered compound TD2350 provided significantly greater control of *Botrytis allii* than non-treatment (Table 1). TD2350 was followed in effectiveness by Topsin M (2 lb/a), the combination of Topsin M (1 lb/a) and TD2350 (1 lb/a), and Topsin M (1 lb/a).

The second evaluation on July 17-21, of fungicide applications to plants from untreated seed indicated the combination of Topsin M (1 lb/a) and TD2350 (1 lb/a) provided the best control, followed by Topsin M (2 lb/a), TD2350 (1 lb/a), and Topsin M (1 lb/a). All of these treatments provided statistically significant control over untreated plots. The top three treatments (Topsin M plus TD2350, Topsin M at 2 lb/a, and TD2350) were also significantly better than either Rovral or Ronilan.

Although there were no significant differences between fungicide applications in the seed-treated plots or the visual rating of percent standing plants on July 24, the trend remained the same. Topsin M, followed by TD 2350, provided the best results.

Rovral, Ronilan, Ridomil / Bravo, and CGA-219417 treatments did not provide adequate control of *Botrytis allii,* or significantly greater control than non-treatment in this trial. However, a single year of data is not adequate to draw conclusions concerning the performance of a product.

It is important to note that many bulb infections did not proceed to kill plants, but only affected yield on weak plants, and contributed to spore production generally. Application of fungicides was directed primarily to developing scapes for scape blight control. Treatment for basal infections would be better directed at the bulb.

Table 1. Incidence of *Botrytis allii* symptoms in seed onions on the Agency Plains near Madras, Oregon following seed treatment with Topsin M, and a single fall application and double spring applications of fungicides on the following dates during 1995.

		Percent infected bulbs			Standing plants
		Untreated seed	Untreated seed	Treated seed	Entire Plot
Material	Rate	15-19 Jun	17-21 Jul	17-21 Jul	24 Jul
Topsin M	1 lb	51 ab	65 bcd	71	60
Topsin M	2 lb	43 ab	49 cd	59	70
TD 2350	1 lb	40 b	51 cd	69	67
Topsin M	1 lb				
+ TD 2350	1 lb	55 ab	48 d	52	63
Ridomil/Bravo	1 lb	80 ab	79 abed	82	60
CGA-219417	lb	80 ab	82 abc	78	60
Rovral	2 lb	80 ab	88 ab	96	45
Ronilan	2 lb	79 ab	88 ab	91	45
Untreated		84 a	99 a	92	50
				n.s.	n.s.

Mean separation with the T-method at P 0.05