

Rhizoctonia stem canker on beans

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Rhizoctonia stem canker is responsible for poor stands, reduced plant growth, and uneven maturation in beans produced in California. A common soil fungus, *Rhizoctonia solani* (Kuehn), is the cause of this disease. The water mold *Pythium* sp. can cause a seed decay and occasionally attacks older plants. Treatment therefore must include a fungicide to control both fungi. Fungicidal seed treatment usually ensures the establishment of an adequate stand under adverse conditions, allows the reduction of seeding rates, and theoretically should increase yields. A combination of chloroneb (formerly Demosan) and captan is the standard seed treatment; chloroneb is effective against *Rhizoctonia* for only the first 20 days after planting.

Since several new systemic fungicides have become available, we established plots at the University of California South Coast Field Station, Irvine, and in Ventura County fields to develop information on the effectiveness of these materials in controlling rhizoctonia and pythium seedling diseases. Furmecyclox (Epic) was tested as a seed treatment for control of rhizoctonia disease and metalaxyl (Apron) was included for pythium disease.

1982 trial, Irvine

In the 1982 trial at the UC South Coast Field Station, we inoculated the covering soil with *Rhizoctonia* at planting time to ensure maximum disease incidence. We obtained the *Rhizoctonia* inoculum by growing the fungus on previously sterilized water-soaked whole oats in glass jars at room temperature (about 21°C [70°F]) until it had totally colonized the oats in the jars. The oats were then air-dried, ground, and passed through a 2-mm mesh screen, after which they were stored in polyethylene sacks at 6°C (42°F) until used.

Seed treatment fungicides were applied at rates per 100 pounds of bean seed. On August 25, 100 pinto bean seeds were planted per plot, and each plot was replicated five times. *Rhizoctonia* inoculum was metered through a granular applicator and applied in the planting furrow as the seed were covered with soil.

Plant stand counts were taken on September 15 and disease incidence assessed on 10 plants on September 24 (table 1). Captan + furmecyclox, captan + chlor-



TABLE 1. Effect of fungicidal seed treatment on pinto beans, 1982

Treatment/ 100 lb seed	Plant stand Sept. 15*	Disease rating Sept. 24*†
captan 75W, 1.75 oz. + furmecyclox 46F, 2.66 fl. oz.	74 a	0.9 a
captan 75W, 1.75 oz. + chloroneb 65W, 4 oz.	81 a	1.1 a
metalaxyl 2EC, 2 fl. oz. + furmecyclox 46F, 1.7 fl. oz.	76 a	1.2 a
furmecyclox 46F, 1.7 fl. oz.	65 b	1.2 a
No treatment	51 c	2.0 b
captan 75W, 1.75 oz.	49 c	2.4 b
metalaxyl 2EC, 2 fl. oz.	47 c	2.4 b

*Duncan's multiple range test used at the 5 percent level. Treatment means followed by the same letter are not significantly different.

†Disease was rated on a scale of 0 to 3, with 0 representing no disease on the underground stem, and 3, lesions completely encircling the stem.

TABLE 2. Effect of fungicidal seed treatment on 'Fordhook' lima beans, 1983

Treatment/ 100 lb seed	Plot 1*		Plot 2*
	Plant stand June 23‡	Disease rating June 23†	Disease rating July 20
metalaxyl 25W, 2 oz. + furmecyclox 46F, 2 fl. oz.	288 a	0.1 a	0.6 a
captan 75W, 1.75 oz. + chloroneb 65W, 4 oz.	245 ab	1.0 b	1.5 ab
No treatment	210 b	1.3 bc	1.8 b
<i>Trichoderma</i> sp.	128 c	1.6 c	—

*Duncan's multiple range test, 5 percent level.

†See rating footnote (†) in table 1.

‡Plant stand count made on 100 feet of row per replicate.

TABLE 3. Effect of fungicidal seed treatment on 'Fordhook' lima beans, 1984

Treatment/ 100 lb seed	Disease rating†			
	Plot 1 July 2**	Plot 2 July 2**	Plot 3 July 10**	Plot 4 July 17*
metalaxyl 25W, 2 oz. + furmecyclox 46F, 1.75 fl. oz.	0.2 a	0.2 a	0.2 a	1.3 a
captan 75W, 1.75 oz. + chloroneb 65W, 4 oz.	1.1 b	1.3 b	2.0 b	2.5 b
No treatment	2.5 c	1.8 b	2.5 b	2.9 c

*Duncan's multiple range test, 5 percent level.

**Duncan's multiple range test, 1 percent level.

†See rating footnote (†), table 1.

