Effect of Fungicides Applied at Different Rates on Control of Sclerotinia Leaf Drop of Lettuce - 1990 Field Test

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Abstract

Leaf drop of lettuce, caused by the plant pathogenic fungi Sclerotinia sclerotiorum and S. minor, is found every year in some lettuce fields in Arizona. When environmental conditions are favorable, disease incidence and resulting crop loss can be significant. During the 1989-90 lettuce season in western Arizona, different fungicides and rates of materials were evaluated in the field for disease control. Ronilan and Rovral, the two fungicides currently registered for use on lettuce for control of Sclerotinia leaf drop, provided significant disease suppression and increased yields at all rates tested. Bravo and Botran did not control the disease.

Introduction

Leaf drop of lettuce, caused by Sclerotinia sclerotiorum and S. minor, can be found in some lettuce fields in Arizona every year. As with other fungal diseases of vegetable crops, environmental conditions have a significant influence on the development of leaf drop of lettuce. Generally, prolonged cool and moist conditions favor disease development. Continuous cropping of lettuce in fields where the disease is found can increase the numbers of pathogen sclerotia present in suceeding plantings of lettuce, which can lead to increasing levels of disease. The fungicides Rovral and Ronilan are currently registered for use on lettuce and can provide significant control of Sclerotinia leaf drop.

Materials and Methods

In 1989-90, a fungicide trial was established at the Yuma Agricultural Center to evaluate different materials and rates for control of Sclerotinia leaf drop of lettuce. Inoculum of Sclerotinia sclerotiorum was produced in glass containers by seeding moist sterilized barley grain with sclerotia of the fungus. Abundant sclerotia were formed after incubation of the inoculated barley grain for three months at 75-81 F. The mixture of sclerotia and infested grain was used as inoculum. Lettuce (Vanguard 75) was seeded November 14, 1989 in double rows 12 inches apart on 40-inch beds.

After thinning the lettuce at the 3-to 4-leaf stage to a 12-inch spacing, one pint of the dried mixture of sclerotia and infested grain was distributed evenly on each lettuce bed in a band 20 inches wide and 50 feet long. Fungicide treatments were applied to the entire surface of treated beds immediately after inoculum distribution (January 2, 1990) and three weeks later (January 24, 1990) with a tractor-mounted boom sprayer with nozzles spaced 12 inches apart. Treatments were replicated four times in a randomized complete block design. Each replicate consisted of 50 ft. of bed, which contained two 50 ft. rows of lettuce. Treatment beds were separated by single nontreated but inoculated beds. Furrow irrigation was used for the duration of this trial. Disease development was monitored by recording the number of collapsed lettuce plants. The percentage of marketable heads was determined at the conclusion of the test at plant maturity (March 15, 1990).

Results and Discussion

Results of this test are summarized in Table 1. Rovral and Ronilan significantly reduced the incidence of disease and increased yields, while Bravo and Bravo plus Botran did not. No symptoms of phytotoxicity were observed. For either Ronilan or Rovral, there was no significant difference in disease control or number of marketable heads between 50 or 100 gallons of water per acre or between 1 and 2 lb. of active ingredient, although there was a tendency toward lower disease incidence and higher percentage of marketable heads when the rate was increased from 1 to 2 lb. a.i. for each product. Also, there was no significant statistical difference between Rovral and Ronilan in effectiveness in controlling Sclerotinia leaf drop of lettuce in this trial, when like rates or gallons of water used per acre for each compound are compared.

Table 1.

Results of 1990 Sclerotinia Leaf Drop Test on Lettuce

Treatment and Rate per acre	Percent Diseased Heads	Percent Marketable Heads
Control	50 a*	39 d
Bravo 720 2 pt. product (100 GPA)	48 a	41 d
Bravo 720 3 pt. product (100 GPA)	47 a	44 d
Bravo 720 + Botran 75W 2 pt. + 2.67 lb. product (100 GPA)	43 ab	39 d
Rovral 50W 1 lb. a.i. (50 GPA)	27 bc	64 c
Rovral 50W 1 lb. a.i. (100 GPA)	24 cd	64 c
Rovral 50W 2 lb. a.i. (100 GPA)	18 cde	69 bc
Ronilan 50 DF 1 lb. a.i. (50 GPA)	11 cde	76 ab
Ronilan 50 DF 1 lb. a.i. (100 GPA)	10 de	81 ab
Ronilan 50 DF 2 lb. a.i. (100 GPA)	5 e	85 a

* Values followed by the same letter are not significantly different (P = 0.05) according to Duncan's Multiple Range Test.