Sclerotinia Leaf Drop of Lettuce - An Evaluation of New Fungicides for Disease Control

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ABSTRACT

Leaf drop of lettuce, caused by Sclerotinia sclerotiorum, is a sporadic, but destructive, disease in Arizona. Field trials were established during 1987 and 1988 to evaluate potential new fungicides for disease control. Ronilan and Rovral, the two materials currently registered for use on lettuce for Sclerotinia leaf drop, were consistently among the most effective fungicides for disease control. Levels of disease control equivalent to that provided by Rovral and Ronilan were observed with CGA-449, SC-0858, SDS-65311, Bay HWG 1608, and Spotless. These field tests have identified several potential new fungicides for control of leaf drop of lettuce caused by S. sclerotiorum.

INTRODUCTION

Leaf drop of lettuce is a destructive, but sporadic, disease in Arizona. The dicarboximide fungicides, Rovral (iprodione) and Ronilan (vinclozolin), currently provide effective disease control. Recently, however, in vitro development of resistance to dicarboximide fungicides by Sclerotinia minor has been reported. The purpose of this research project was to identify new fungicides that effectively control leaf drop of lettuce in case Rovral and/or Ronilan lose effectiveness.

MATERIALS AND METHODS

Fungicide trials were established at the Yuma Valley Agricultural Center during 1987 and 1988. Inoculum of Sclerotinia sclerotiorum was produced in 2- quart glass containers by seeding moist sterilized barley grain with sclerotia of the fungus. After three months of incubation at 75-81°F in the laboratory, abundant sclerotia were formed. The mixture of sclerotia and infested grain was used as inoculum. Lettuce (Vanguard 75) was seeded in mid-November, with double rows 12 inches apart on beds 40 inches wide.

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 (early January) and again 2 to 3 weeks later.

Treatments were replicated four times in a randomized complete block design, with each replicate consisting of 50 feet of bed which contained two 50 foot rows of lettuce. Furrow irrigation was used for the duration of these tests. Disease development was monitored by recording the number of collapsed lettuce plants.

RESULTS AND DISCUSSION

The results of these fungicide trials are summarized in Tables 1 and 2. In the 1987 trial (Table 1), all tested compounds except Bay HWG 1608 and Baycor significantly reduced the incidence of disease and increased yields, provided that a sufficient rate of fungicide was applied. No symptoms of phytotoxicity were observed. In the 1988 trial, all tested materials significantly reduced the incidence of disease; the percent of marketable heads was increased by all fungicides except Bay HWG 1608.

Rovral and Ronilan, the two compounds registered for use on lettuce for control of Sclerotinia leaf drop, were consistently among the most effective fungicides for disease control. Levels of disease control equivalent to that provided by Rovral and Ronilan were observed with CGA-449, SC-0858, SDS-65311, Bay HWG 1608, and Spotless in 1988.

These field trials have identified several potential fungicides for control of leaf drop of lettuce caused by Sclerotinia sclerotiorum. Further tests and evaluations of each material by the manufacturer will determine whether any of these new materials will be registered.

Table 1. Effect of fungicides on severity of lettuce drop in 1987 field trial.

Treatment	Rate of Product/Acre	Percent Diseased Plants	% Increase in * Potential Yield
Control	--	44 a **	--
Bay HWG 1608 1.2 EC	12 fl. oz.	39 ab	11
Baycor 50 W	2 lb.	38 ab	14
Bay HWG 1608 1.2 EC	24 fl. oz.	37 ab	16
Spotless 25 W	0.5 lb.	36 abc	18
SC-0858 50 W	1 lb.	36 abc	18
CGA-449 50 W	2 lb.	31 bcde	30
SC-0858 50 W	2 lb.	26 cde	41
Spotless 25 W	2 lb.	26 cde	41
Spotless 25 W	1 lb.	25 de	43
Rovral 50 W	2 lb.	25 de	43
Ronilan 50 W	2 lb.	21 e	52

* The percent increase in potential yield was derived by comparing the number of healthy plants in plots treated with fungicides to the number of healthy plants in nontreated (control) plots.

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

Table 2. Effect of fungicides on severity of lettuce drop in 1988 field trial.

Treatment	Rate of active ingredient per acre	Number of* lesions
Control	--	132 a**
Bayleton 50 W	0.06 lb.	86 ab
Tilt 3.6 EC	0.06 lb.	76 ab
Rally 40 W	0.075 lb.	16 b
Spotless 25 W	0.04 lb.	12 b

* Percentage of heads that would be of acceptable quality for commercial harvest.

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