Sclerotinia Leaf Drop of Lettuce - Testing New Fungicides And Formulations of Ronilan for Disease Control

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ABSTRACT

Leaf drop of lettuce, caused by the fungus Sclerotinia sclerotiorum, is a sporadic but potentially destructive disease in Arizona. During the 1988-89 lettuce season in western Arizona, different fungicides and formulations of materials were evaluated in the field for disease control. All tested compounds provided significant disease suppression and increased yields, provided that a sufficient rate of fungicide was applied. Ronilan and Rovral, the two fungicides currently registered for use on lettuce for Sclerotinia leaf drop, were the most effective fungicides in this test, performing significantly better than the two experimental materials. The 50DF formulation of Ronilan provided significantly better disease control than the 50W formulation of the same compound.

INTRODUCTION

Leaf drop of lettuce, caused by Sclerotinia sclerotiorum, is a yearly threat to lettuce production in Arizona. As with many other fungal diseases of vegetable crops, environmental conditions have a profound influence on the development of leaf drop of lettuce. Prolonged cool and moist conditions favor disease incidence and severity.

The fungicides Ronilan and Rovral, currently registered for control of leaf drop of lettuce, provide effective disease control. There is no guarantee that these materials will always be available to combat this disease; therefore, the objective of this study was to test new compounds in order to discover new potential chemicals for disease control.

MATERIALS AND METHODS

This study was conducted at the Yuma Valley Agricultural Center during the 1988-89 season. Inoculum of Sclerotinia sclerotiorum was produced in 2-liter 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 15, 1988 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 (December 29, 1988) and three weeks later (January 17, 1989). Treatments were replicated four times in a randomized complete block design. Each replicate consisted of 50 feet of bed, which contained two 50 feet rows

of lettuce. Treatment beds were separated by single nontreated but inoculated beds. Fungicides were applied to the surface of treated beds with a tractor-mounted boom sprayer that delivered 100 gallons/acre at 100 psi to nozzles spaced 12 inches apart. Furrow irrigation was used for the duration of this trial. Disease severity was determined March 21, 1989 by recording the number of collapsed lettuce plants. The percentage of marketable heads was determined at this time as well.

RESULTS AND DISCUSSION

The results of this study are summarized in Table 1. All tested fungicides significantly reduced the incidence of disease and increased yields, provided that a sufficient amount of fungicide was applied. No phytotoxicity symptoms were observed with any of the treatments.

Ronilan and Rovral, the two compounds registered for use on lettuce for control of Sclerotinia lettuce drop, provided the most effective disease control and subsequent yield increase in this study. The 50DF formulation of Ronilan was more effective than the 50WP formulation in control of leaf drop.

The experimental fungicides, RH-7592 and ICIA-0523, significantly reduced disease severity and increased marketable heads, although not as effectively as Ronilan and Rovral. It should be noted that the application rates for the experimental compounds was much lower than the rates for Ronilan and Rovral.

This field trial has identified two experimental fungicides that provided significant control of leaf drop of lettuce caused by Sclerotinia sclerotiorum. Additionally, we learned that different formulations of the same fungicide can give significantly distinct levels of disease control.

Table 1. Effect of fungicides on severity of lettuce drop.

Treatment	Rate of product/acre	Percent diseased plants	Percent marketable heads
Control	--	60 a	30 d
RH-7592 0.5 EC	0.125 lb.	53 b	36 cd
ICIA-0523 0.5 EC	0.06 lb.	52 bc	36 cd
RH-7592 0.5 EC	0.25 lb.	50 bc	40 c
ICIA-0523 0.5 EC	0.12 lb.	42 d	42 c
Rovral 50W	1 lb.	34 e	52 b
Ronilan 50W	1 lb.	20 f	63 a
Ronilan 50DF	1 lb.	11 g	67 a

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