Powdery Mildew of Cantaloupe - An Evaluation of New Fungicides for Disease Control

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ABSTRACT

Powdery mildew of cantaloupe, caused by Sphaerotheca fuliginea, is a perennial and often devastating disease in Arizona. During 1987 and 1988, potential new fungicides were evaluated in field trials for disease control. In 1987, Bayleton, Rally and Spotless provided significant disease control. In 1988, Rally and Spotless significantly reduced development of powdery mildew, while Bayleton and Tilt were less effective. Uneven development of powdery mildew within the plot may partially explain the apparent lack of significant disease control in 1988 by Bayleton and Tilt.

INTRODUCTION

Powdery mildew of cantaloupe is a perennial and often devastating disease in the desert southwest. Disease symptoms first appear as small, white, superficial spots on cantaloupe stems and leaves. As these lesions enlarge, they appear powdery, increase in number and coalesce, eventually covering stems and both leaf surfaces. Infection on young leaves can result in general chlorosis and eventual death of the affected leaf. Severely affected leaves become brown and dessicated, with resultant premature defoliation. Cantaloupe fruit are free of visible infection; however, severely infected plants yield prematurely ripened fruit that lack flavor. The reduction of yield is proportional to the duration and severity of the disease.

Powdery mildew of cantaloupe is favored by low relative humidity, dry soil conditions, moderate temperatures, reduced light intensity, and succulent plant growth. Spores of the fungus can germinate in the absence of free water and in a relative humidity of less than 20%.

MATERIALS AND METHODS

During 1987 and 1988, fungicide trials were established at the Yuma Valley Agricultural Center to examine the efficacy of new fungicides for controlling this disease in the desert Southwest. The cantaloupe cultivar 'Topmark' was planted March 19 in 1987 and March 2 in 1988 on 80-inch wide beds. Replicate treatments were randomized in a complete block design, consisting of 50 feet of row with a plant spacing of 12 inches. Fungicides tested in 1987 were Bayleton, Rally, and Spotless; the trial in 1988 included Bayleton, Rally, Spotless, and Tilt. Fungicides were applied four times in 1987 (May 22, June 4 and 18, and July 2) and three times in 1988 (May 19, June 1 and 22). Disease incidence and severity was determined by collecting 25 leaves at random from each replicate of each treatment at crop maturity and counting the number of powdery mildew lesions present.

RESULTS AND DISCUSSION

Results of these field tests are summarized in Tables 1 and 2. In the 1987 trial, all tested fungicides significantly reduced disease levels. Disease pressure was moderate in 1987 and the distribution of fungal lesions within the test plot was fairly uniform.

For the 1988 test, Rally and Spotless provided significant control of powdery mildew; Bayleton and Tilt did not provide control. Disease levels were generally higher than those observed in 1987, although the distribution of fungal lesions was highly variable. The disease gradient ranged from highest in the southeast to lowest in the northwest corner of the plot. This highly skewed pattern of disease development caused a large variation in disease levels among the replicates in each treatment, which may partially explain why Bayleton and Tilt did not perform well in this trial. No symptoms of phytotoxicity were observed.

Previous research has identified two different fungal genera as causal agents of powdery mildew of cantaloupe in the desert Southwest, Erysiphe cichoracearum and Sphaerotheca fuliginea. Microscopic examination of conidia from diseased cantaloupe leaves revealed well-developed fibrosin bodies, which suggests that we were dealing with Sphaerotheca fuliginea in these fungicide trials.

When this report was written, only Bayleton was registered for use on cantaloupe; however, Rally was close to registration. Check the current status of Rally when considering control measures for powdery mildew of cantaloupe.

Table 1. Effect of fungicide treatments on development of powdery mildew on cantaloupe in 1987 field trial.

Treatment	Rate of active ingredient per acre	Number of* lesions
Control	--	42.00 a**
Spotless 25 WP	0.02 lb.	7.00 b
Bayleton 50 W	0.25 lb.	6.25 b
Rally 60 DF	0.063 lb.	2.25 b
Rally 60 DF	0.125 lb.	0.50 b
Spotless 25 WP	0.04 lb.	0.50 b

*Each value is the average number of lesions recorded from 25 leaves collected at random from each replicate plot in a treatment.

**Values followed by the same letter are not significantly different (P=0.01) according to Duncan's Multiple Range Test.

Table 2. Effect of fungicide treatments on development of powdery mildew on cantaloupe in 1988 field trial.

Treatment	Rate of Product/Acre	Percent Diseased Plants	% Increase in * Potential Yield
Control	--	48 a **	21 d
SC-0858 50 W	2 lb.	28 b	43 bc
SDS-65311 50 W	1 lb.	27 bc	48 abc
Bay HWG 1608 1.2 EC	3.3 qt.	26 bc	36 cd
Ronilan 50 W	1 lb.	23 bc	52 ab
Rovral 50 W	2 lb.	22 bc	53 ab
SDS 65311 50 W	2 lb.	22 bc	42 bc
Rovral 50 W	1.5 lb.	17 bc	54 ab
Spotless 25 W	4 lb.	16 bc	46 abc
CGA-449 50 W	2 lb.	16 bc	53 ab
Ronilan 50 W	2 lb.	14 c	57 a

*Each value is the average number of lesions recorded from 25 leaves collected at random from each replicate plot in a treatment.

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