EFFECT OF FUNGICIDES AND SPRAY PROGRAMS ON DOWNY MILDEW OF BUTTERNUT SQUASH IN GEORGIA I, 2004.

David B. Langston, Jr.
University of Georgia
Cooperative Extension Service
Dept. Plant Pathology
P.O. Box 1209
Tifton, GA 31793

Introduction

Downy mildew (*Pseudoperonospora cubensis*) is one of the most destructive diseases of cucurbits in the Southeast. Severe losses are experienced by Georgia growers every year, especially in cantaloupe, cucumber, and squash. Several fungicides have been made available over the years to suppress losses to this disease but poor efficacy and fungicide resistance have made the need for newer, more effective fungicides with different modes of action necessary for adequate disease suppression. This study examines many of the new fungicide chemistries available for use on cucurbits.

Materials and Methods

Butternut squash seed (*Cucurbita moschata* "Waltham") were planted to raised drip-irrigated black plastic beds at the University of Georgia Coastal Plain Experiment Station in Tifton, GA. Seed were placed every 18 in in rows spaced 6 ft apart. Standard practices for management of fertility, weeds, nematodes and insects for butternut squash grown in Georgia were followed throughout the season. The experiment utilized a randomized complete block design with four replications. Fungicide plots were one, 15-ft long row that utilized a 3-ft buffer zone between plot ends. Foliar fungicide treatments were initiated just prior to anthesis (14 Sep). Fungicides were applied using a CO_2 pressurized backpack sprayer calibrated to deliver 40 gal/A at 75 psi through TX-18 hollow cone nozzles spaced 19 in apart. Powdery mildew was suppressed by a tank-mix of 8 oz of Procure and 9 oz of Endura sprayed on 10/13/04 and 10/29/04. Rainfall was well above average with 16.7 in being received while the 91 year average for the entire months of Aug, Sep, Oct, and Nov being 13.1 in. This increase in rainfall was primarily due to several hurricane events in the fall of 2004.

Results

Although weather during the experiment seemed favorable for downy mildew development, disease developed slowly and did not completely defoliate the crop entirely. The first symptoms were observed on 5 Oct. All treatments significantly suppressed downy mildew compared to the check on the non-treated plots on the 12 Oct rating. On the 25 Oct rating, more distinct separation of treatments was observed and all treatments except Flint suppressed disease compared to the check. By the final rating, both Flint and Cabrio were the only treatments that did not significantly suppress disease compared to the non-treated plots. No phytotoxicity was observed with any treatments.

Table 1. Effect of fungicides on downy mildew of butternut squash.

Treatment, rate/acre and spray timing[1]	Downy Mildew[2] 12 Oct		25 Oct		5 Nov	
Ranman @ 2.75 fl oz/acre + Silwett @ 2.0 fl oz/acre (1-7)	2.5	b[3]	2.5	d	4.3	ef
Bravo @ 2.0 pt/acre (1,2,4,6) Ranman @ 2.75 fl oz/acre + Silwett @ 2.0 fl oz/acre (3,5,7)	2.0	b	3.5	cd	4.0	ef
Bravo @ 2.0 pt/acre (1,2) Cabrio @ 12.0 oz/acre (4,6) Ranman @ 2.75 fl oz/acre + Silwett @ 2.0 fl oz/acre (3,5,7)	3.3	b	3.5	cd	4.0	ef
Bravo @ 2.0 pt/acre (1,2,6) Ridomil Gold Bravo @ 2.0 lb/acre (4) Ranman @ 2.75 fl oz/acre + Silwett @ 2.0 fl oz/acre (3,5,7)	2.3	b	3.5	cd	3.8	ef
Bravo @ 1.5 pt/acre (1-7)	2.5	b	2.8	d	5.0	de
Ridomil Gold Bravo @ 2.0 lb/acre (1-7)	2.8	b	3.3	cd	4.5	ef
Flint @ 4.0 oz/acre (1-7)	2.8	b	7.0	a	8.5	a
Dithane @ 3.0 lb/acre (1-7)	2.8	b	3.3	cd	3.5	f
Cabrio @ 12.0 oz/acre (1-7)	2.5	b	5.5	b	6.5	bc
Gavel @ 2.0 lb/acre (1-7)	2.3	b	2.5	d	3.5	f
Aliette @ 3.0 lb/acre (1-7)	3.0	b	4.3	c	6.3	cd
Non-treated control	6.5	a	7.0	a	7.8	ab

[1]Spray dates are as follows: 1=14 Sep; 2=24 Sep; 3=1 Oct; 4=7 Oct; 5=15 Oct; 6=21 Oct; 7=28 Oct.

[2]Downy mildew severity was rated on a 1-10 scale where 1=0-10% leaf area affected by downy and 10=100% affected.

[3]Means in columns followed by the same letter(s) are not significantly different at according to Fisher's Protected LSD test.