CONTROL OF GUMMY STEM BLIGHT OF MUSKMELON WITH BIOFUNGICIDES AND REDUCED-RISK FUNGICIDES USING MELCAST AND SPRAY SCHEDULES

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Introduction

Gummy stem blight (*Didymella bryoniae*) is one of the most common diseases affecting cantaloupe in Georgia. This disease is generally suppressed with currently labeled fungicides, however, biopesticides and reduced-risk fungicides may be used to reduce the total amount of non-reducded-risk fungicides applied. This work was conducted as part of a federally-funded CSREES grant to determine if biopesticides and reduced-risk fungicides could be incorporated into fungicide programs for controlling gummy stem blight without compromising yield and quality of cantaloupe.

Materials and Methods

Muskmelon transplants were planted to black plastic-covered beds in a commercial drip-irrigated field at the University of Georgia Rural Development Center Ag. Showcase area in Tifton, GA on 15 Apr. The planting pattern consisted of plants spaced 24 in. apart on plant beds spaced 6 ft from center to center. Standard practices for management of fertility, weeds, nematodes and insects for muskmelon grown in Georgia followed University of Georgia Extension recommendations. The experiment was arranged as a randomized complete block design with 4 replications. Fungicide plots were 30-ft long and utilized a 6-ft buffer zone between plot ends. Fungicides were applied using a CO_2-pressurized backpack sprayer calibrated to deliver 40 gal/A at 60 psi through TX-26 hollow cone nozzles. Treatments were applied on a schedule or according to the MELCAST muskmelon model for Alternaria leaf blight using a threshold of 20 EFI to trigger fungicide applications. Weather data used for the MELCAST model was calculated via Skybit®. Mature fruit at full- and half-slip stages were harvested from the center 20 ft of each plot on 16, 18, 20, 23, 25, 27, and 30 Jun. Soluble solids (Brix) were measured on three fruit from each plot using a hand-held refractometer on 23 Jun. Weather during the experiment was near normal with rainfall only 0.53 in below the 50-yr average.

Results

Disease was detected first on 10 Jun and resulted in severe defoliation of non-treated plots by harvest. All spray programs significantly reduced area under the disease progress curve (AUDPC) compared to the non-treated control (Table 1). The Manzate/Echo schedule, Messenger/Echo schedule, Echo MELCAST, and Messenger/Quadris/Echo schedule programs significantly reduced the AUDPC below that of the Quadris/Echo MELCAST and Messenger/Quadris/Echo MELCAST programs. No differences in yield or Brix were detected between treatments.

Table 1. Effect of fungicide spray programs on gummy stem blight, yield, & Brix.

Treatment and rate/A[z]	AUDPC[y]		Marketable[x] yield(lb/plot)		Brix[w]	
Manzate 75DF, 3.0 lb (2, 3, 5, 6)						
Echo 720SC, 3.0 pt (8, 9)	22.8	c[v]	98	a	7.6	a
Messenger 3WG, 4.5 oz (1, 5)						
Echo 720SC, 3.0 pt (2, 3, 5, 6, 8, 9)	17.5	c.	70	a	7.9	a
Echo 720SC, 3.0 pt (2, 4, 7, 10) MELCAST	20.4	c.	94	a	8.5	a
Messenger 3WG, 4.5 oz (1, 5)						
Quadris 2.08SC, 15.4 fl oz (2, 5, 8)						
Echo 720SC, 3.0 pt (3, 6, 9)	20.4	c.	79	a	8.3	a
Quadris 2.08SC, 15.4 fl oz (1, 7) MELCAST						
Echo 720SC, 3.0 pt (4, 10) MELCAST	47.3	b.	83	a	8.6	a
Messenger 3WG, 4.5 oz (1, 5)						
Quadris 2.08SC, 15.4 fl oz (1, 7) MELCAST						
Echo 720SC, 3.0 pt (4, 10) MELCAST	40.8	b.	80	a	8.4	a
Non-treated	72.3	a.	78	a	7.8	a

[z]Spray dates are shown parenthetically and are as follows: 1=7 May; 2=13 May; 3=20 May; 4=23 May; 5=28 May; 6=4 Jun; 7=6 Jun; 8=11 Jun; 9=18 Jun; 10=20 Jun.
[y]Area under disease progress curve calculated from disease ratings (modified Horsfall-Barrett 0-10) taken 10, 18, and 24 Jun.
[x]Total marketable yield taken from the center 20 ft of each plot.
[w]Measured on fruit picked on 23 Jun.
[y]Means followed by the same letter(s) are not significantly different according to Fisher's protected LSD test at $P \leq 0.05$.