

INTEGRATED USE OF RIDOMIL GOLD AND OTHER COMPOUNDS FOR MANAGEMENT OF PHYTOPHTHORA BLIGHT IN SQUASH

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Introduction

Phytophthora blight caused by *Phytophthora capsici* is responsible for serious losses to growers of summer squash in Georgia and other states. The efficacy of current strategies for management of this disease is limited. Resistant squash cultivars are not available and no single fungicide has shown to provide consistent and effective suppression of the disease. Integrated use of different compounds through soil treatments and foliar applications may improve the efficacy in disease suppression. This study was to evaluate the effectiveness of integrating Ridomil Gold and other products for control of *P. capsici* on squash.

Materials and Methods

This trial was conducted at University of Georgia Coastal Plain Experiment Station (Black Shank Farm) located in Tifton, GA. The field site has been used as a *P. capsici* nursery and was inoculated with the pathogen. Raised beds were prepared for squash growth that were 6-inch-high by 30-inch-wide and centered 6 feet apart. Yellow squash seedlings (cv. Gemini) were transplanted at 12 inch spacing within a row into raised beds in the field on April 9. The experimental plots consisted of a single row which was 25 feet long. Buffer zones with 5 feet spacing without planting of squash seedlings were maintained between plots. A randomized complete block design was employed with five replications. The drip tape used was Aquatraxx[™] with a 12-inch emitter spacing and a flow rate of 0.45 gal/min with a 12-PSI regulator. All plots were irrigated with additional overhead water twice a day starting May 1 and three times a day beginning May 25 until June 1. On June 2 plots received more than 2 inches of rainfall. Additional inoculum of *P. capsici* was applied to each plot on May 16 by placing 1/8 teaspoon of *P. capsici* infested beet seed (approximately 15-20 seeds) in three locations in each plot just below the soil surface. Asana (9.6 oz./A) was sprayed on May 31 for control of insects.

Ridomil Gold 480SL and other products were applied through drip irrigation tubes or as foliar sprays at the rates as described in Table 1. Non-treated plots and Ridomil Gold 480SL applied alone were used as controls. Plants with Phytophthora blight were counted weekly after first appearance of symptoms in the field. All plots were hand harvested on May 14, 21, 25, 30, and June 6. Marketable and unmarketable yields were determined and the number of *P. capsici* infected fruit was recorded. Analysis of variance (ANOVA) was used to determine the effect of the treatments on disease incidence and squash yield using the Statistical Analysis System (SAS Institute, Cary, NC).

Results and Discussion

The squash cultivar Gemini was susceptible to Phytophthora blight and the final disease incidence reached 47% in the non-treated control plots (Table 1). Soil treatment with Ridomil Gold 480SL prior to transplanting in conjunction with 3 or 4 foliar sprays of Revus, Activator, Kocide and 2 or 3 foliar applications of Ridomil Gold Copper provided significant disease suppression compared with the non-treated control (Table 1). Ridomil Gold applied alone did not reduce disease incidence significantly compared to the non-treated control. Combined use of Ridomil Gold 480SL as soil treatment with four foliar sprays of Revus, Activator, Kocide (1.5 lb/acre) and two foliar applications of Ridomil Gold Copper also increased plant vigor and total number of squash fruit (data not shown). The number of infected fruit was not significantly affected by all the treatments.

Table 1. Efficacy of Ridomil Gold and other compounds in control of *Phytophthora* blight on squash.

Treatment and rate	Application schedule ¹	Yield (lb/A) ²		Disease	
		Marketable	Total	Infected fruit ^{2,3}	Infected plant (%) ^{2,4}
Non-treated control	----	50,573 b	54,036 a	8.8 a	47.2 a
Ridomil Gold 480SL, 16 fl. oz/A	A				
REVUS 2.09SC, 8 fl. oz/A	BCEF				
Activator 90	BCEF	49,528 ab	54,428 a	13.4 a	23.2 b
Kocide 3000 46.1DF, 1.5 lb/A	BCEF				
Ridomil Gold Copper 65WP, 2 lb/A	DG				
Ridomil Gold 480SL, 16 fl. oz/A	A				
REVUS 2.09SC, 8 fl. oz/A	BCEF				
Activator 90	BCEF	53,840 ab	59,851 a	13.0 a	18.4 b
Kocide 3000 46.1DF, 0.75 lb/A	BCEF				
Ridomil Gold Copper 65WP, 2 lb/A	DG				
Ridomil Gold 480SL, 16 fl. oz/A	A				
REVUS 2.09SC, 8 fl. oz/A	BDF				
Activator 90	BDF	51,880 ab	56,584 a	10.4 a	26.4 b
Kocide 3000 46.1DF, 1.5 lb/A	BDF				
Ridomil Gold Copper 65WP, 2 lb/A	CEG				
Ridomil Gold 480SL, 16 fl. oz/A	A				
REVUS 2.09SC, 8 fl. oz/A	BDF	58,479 a	63,314 a	13.2 a	38.4 ab
Activator 90	BDF				
Ridomil Gold Copper 65WP, 2 lb/A	CEG				
Ridomil Gold 480SL, 16 fl. oz/A	ABCDEF	57,499 ab	61,877 a	7.4 a	36.8 ab

¹ A = preplant, B = 1 week post transplanting (PP), C = 2 weeks PP, D = 3 weeks PP, E = 4 weeks PP, F = 5 weeks PP, G = 6 weeks PP.

² Data are means of five replications. Means within a column followed by the same letter are not significantly different ($P = 0.05$) according to Duncan's multiple range test.

³ Number of *P. capsici* infected fruit each plot.

⁴ Final disease incidence.