

Efficacy of DuPont fungicides for Phytophthora blight in summer squash, 2005

The objective of this study was to evaluate several fungicide programs for the control of *Phytophthora* blight on summer squash. Treatments applied were alternated with applications of Forum 4.16 SC (6.2 fl oz/A) + different formulations and rates of copper hydroxide. An experiment was conducted at the Long Island Horticultural Research and Extension Center in a field of Haven loam soil where *Phytophthora* blight had developed in at least part of the field in 1991 to 1993, 1995 to 1999, 2003, and 2004. The field was tilled on 13 Jul. Five treatments included seed that was treated with a 2.4% solution of Apron XL LS on 13 Jul before planting. Seed for these five treatments were coated with 0.007 fl oz Apron XL LS and fl oz of water, then allowed to air-dry before planting. Summer squash was direct seeded by hand on 14 Jul. Nitrogen (34-0-0) was side-dressed on 17 Aug. Applications of Quintec 2.08 SC (4 fl oz/A) were made for powdery mildew control on 21 Aug and 19 Sep. The insecticide Asana XL EC (9.6 fl oz/A) was applied to control cucumber beetles on 21 Aug and 6 Sep. During the season weeds were controlled by cultivation and hand weeding along with one application of Strategy 2.1 E (3 pt/A) on 18 Jul. Each plot consisted of one 30-ft row of summer squash spaced 24 in. apart. Rows were spaced 68 in. apart, and the buffer zone from one plot to the next was 10 ft planted with three squash transplants each. A randomized complete block design with four replications was used. Average monthly high and low temperatures (°F) were 81/61 in Jun, 84/67 in Jul, 85/69 in Aug, 79/62 in Sep, and 63/51 in Oct. Rainfall (in.) was 1.20, 1.36, 1.48, 3.46, and 20.32 for these months, respectively. Mature fruit were harvested on 15, 19, 25 Aug, 8, 14, 19 and 21 Sep to keep the plants from declining. Fungicide applications were made on 9, 16, 22, 29 Aug, 5, 12, and 21 Sep. Since *Phytophthora* blight had not developed naturally, likely due to low rainfall, on 25 Aug fruit of border squash plants were inoculated with a single mycelial plug of *Phytophthora capsici* cut with a number nine cork borer from the edge of a 10-day-old actively expanding culture. The field was overhead irrigated immediately afterwards. On 31 Aug all border plants were examined for symptoms of *Phytophthora* blight and approximately 25% of these plants had not yet become infected. These plants were re-inoculated by placing a single infected squash fruit near the base of the plant. Disease incidence (percentage of infected plants per plot) was assessed on 17 Sep. *Phytophthora* crown rot and fruit rot percentages were both assessed on 20 and 26 Sep. A square root transformation was used when needed prior to analysis to achieve homogeneity of variance.

Symptoms of *Phytophthora* fruit rot were first seen on inoculated border plants on 29 Aug and on plants in treatment rows on 7 Sep. Although nontreated control plots usually had numerically highest values for fruit rot and crown rot on 20 and 26 Sep, significant differences were not detected among any treatments, partly due to large variation among plots not associated with blocks. *Phytophthora* blight started to develop 7 weeks after the seed treatment with Apron, which is probably too long for it to contribute to control in this experiment. No symptoms of phytotoxicity were observed.

Treatment and rate/A ^z	Phytophthora disease rating (%)				
	17-Sep	20-Sep		26-Sep	
	Infected plants ^y	Crown rot	Fruit rot	Crown rot	Fruit rot
Nontreated	0.0	46.9	50.0	63.8	66.3
Tanos 50 DF 8 oz + Kocide 2000 DF 1.5 lb + Manex 4 F 1.6 qt(1,3,5,7) alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(2,4,6) ^x	0.0	19.3	21.3	56.3	60.0
Tanos 50 DF 8 oz + Kocide 2000 DF 0.8 lb + Manex 4 F 1.6 qt(1,3,5,7) alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 0.8 lb(2,4,6) ^x	1.3	8.5	10.0	62.5	65.0
Tanos 50 DF 8 oz + DPX-GFJ52 0.8 lb + Manex 4 F 1.6 qt(1,3,5,7) alt Forum 4.16 SC 6.2 fl oz + DPX-GFJ52 0.8 lb(2,4,6) ^x	2.5	40.2	25.0	53.8	61.3
Tanos 50 DF 10 oz + Kocide 2000 DF 1.5 lb + Manex 4 F 1.6 qt(1,3,5,7) alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(2,4,6) ^x	1.3	28.7	27.5	76.3	81.3
Kocide 2000 DF 1.5 lb + Manex 4 F 1.6 qt(1,3,5,7) alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(2,4,6) ^x	5.0	44.2	37.5	72.5	75.0
Tanos 50 DF 8 oz + Kocide 2000 DF 1.5 lb + Manzate 4 F 2 lb(1,4,7); Gavel 75 DF 2 lb + Kocide 2000 DF 1.5 lb(2,5); alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(3,6)	8.8	28.4	11.3	53.8	57.5
Tanos 50 DF 10 oz + Kocide 2000 DF 1.5 lb + Manzate 4 F 2 lb(1,4,7); Gavel 75 DF 2 lb + Kocide 2000 DF 1.5 lb(2,5); alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(3,6)	0.0	14.1	11.3	45.0	53.8
Gavel 75 DF 2 lb + Kocide 2000 DF 1.5 lb(1,4,7); Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(2,5); alt Forum 4.16 SC 6.2 fl oz + Kocide 2000 DF 1.5 lb(3,6)	1.3	5.8	13.8	56.3	63.8
Treatment <i>P</i> -value	0.2628	0.2704	0.4334	0.7554	0.7918

^z Rate of formulated product/A. Fungicide application dates were 1=8/9, 2=8/16, 3=8/22, 4=8/29, 5=9/5, 6=9/12, and 7=9/21. Apron (0.02ml) was applied as a water based slurry to seeds before planting.

^y Percentage of infected plants was evaluated as the percentage of plants showing any symptoms at all of *Phytophthora* infection.

^x Apron XL LS was applied to squash as a 2.4% slurry before planting.