

Efficacy of fungicides for control of Phytophthora blight in pepper on crown rot tolerant and susceptible cultivars, 2006.

The objective of this study was to evaluate the efficacy of fungicides for control of *Phytophthora* blight on a *Phytophthora* crown rot tolerant pepper cultivar, Aristotle, and on a fully susceptible cultivar, Red Knight. Two experiments, one for each pepper cultivar, were set up adjacent to one another, each with six fungicide treatments. A randomized complete block design with four replications was used for both experiments. These field experiments were conducted at the Long Island Horticultural Research and Extension Center on Haven loam soil. Fertilizer (N-P-K 10-10-10) at 400 lb/A was broadcast and incorporated on 12 Jun. Treflan 4 L (2 pt/A) was applied for weed control on 20 Jun. Peppers were seeded on 11-12 May in the greenhouse and transplanted on 22 Jun. Nitrogen (34-0-0) at 88 lb/A was side-dressed on 9 Aug. After planting, weeds were controlled by cultivation and hand weeding. Each plot consisted of two 10-ft rows of peppers spaced 34 in. apart with an in-row plant spacing of 15 in. Buffer zones between plots were 5 ft long and planted with three 'Red Knight' pepper transplants each. At-transplant fungicide treatments were applied to each plot as seedling drenches with a backpack CO₂ pressurized sprayer at 40 psi equipped with a single (TJ60 8003VS) nozzle that was calibrated to deliver 50 ml in a 6 in. band around each pepper seedling. Foliar fungicide treatments were applied with a backpack CO₂ pressurized sprayer at 40 psi equipped with three (TJ60 8003VS) nozzles that delivered 62.5 gal/A. One nozzle was positioned directly over the top of the row and one drop nozzle was on each side of the row. Applications were made on 21 and 25 Jul; 1, 8, 18, 22 and 31 Aug; and 6 and 15 Sep. Average monthly high and low temperatures (°F) were 77/62 in Jun, 84/69 in Jul, 82/67 in Aug, 73/58 in Sep, and 64/48 in Oct. Rainfall (in.) was 5.83, 3.79, 5.48, 3.66, and 5.53 for these months, respectively. Since *Phytophthora* blight had not developed naturally by mid-Aug, one green fruit on the center pepper plant in the border area between plots was inoculated with a single mycelial plug of *P. capsici* cut with a number nine cork borer from the edge of a 10-day-old actively expanding culture on 24 Aug. On 4 Sep no symptoms of *Phytophthora* blight had developed. On 5 Sep, green fruit were inoculated with a 1 sq in. infected piece of a pumpkin fruit from a neighboring *Phytophthora* blight experiment. Overhead irrigation was used throughout the season as needed and used after each inoculation for two hours (7 to 9 PM) for three consecutive evenings to induce *Phytophthora* infection. Plant mortality (percentage of dying plants per plot) and disease severity (percentage of entire plot affected by *Phytophthora* fruit and crown rot) were assessed on 2, 11, and 16 Oct.

Symptoms of *Phytophthora* blight were first observed on 19 Sep on green fruit in border areas between plots and by 1 Oct the disease had spread throughout the field. Visually there was more infection in Red Knight compared to *Phytophthora*-tolerant Aristotle. On 2 Oct disease severity for control plots was 89% for Red Knight and 59% for Aristotle. By 16 Oct, the end of the season, 100% of Red Knight control plants and 91% of Aristotle plants dead. Plant mortality and disease severity were significantly lower than the control for all treatments on all assessments dates on both varieties. Overall, plant mortality was lowest for plants treated with Revus 250 SC (NOA 446510) at the end of the season. Most products performed very well and at the same statistical level when compared only on Aristotle. On Red Knight, Maestro 80 DF resulted in the same statistical level of control for all assessments as the best product tested. No symptoms of phytotoxicity were observed.

Foliar treatment and rate/A (drench treatment and rate)	Red Knight				Aristotle			
	Plant mortality (%)		Disease severity (%)		Plant mortality (%)		Disease severity (%)	
	2-Oct	16-Oct	2-Oct	16-Oct	2-Oct	16-Oct	2-Oct	16-Oct
Revus 250 SC 8 fl oz + Kinetic 0.125% (Revus 250 SC 8 fl oz) ...	11 c*	27 c	10 c	25 c	5 c	3 b	14 b	7 c
Maestro 80 DF 6 lb (Maestro 80 DF 6 lb)	22 c	42 bc	24 bc	35 bc	7 bc	16 b	10 b	18 bc
Ranman 400 SC 2.75 fl oz + Silwet 2 fl oz (Ranman 400 SC 2.75 fl oz)	27 bc	48 bc	26 b	56 b	4 c	18 b	11 b	26 b
SA-110201 32 fl oz (SA-110201 32 fl oz)	28 bc	45 bc	29 b	49 bc	18 b	18 b	26 b	24 bc
V-10161 0.41 EC 3.53 fl oz (V-10161 0.41 EC 3.53 fl oz)	23 c	62 b	23 bc	61 b	7 bc	11 b	13 b	16 bc
Ridomil Gold/Copper WP 2.5 lb (Ridomil Gold EC 2 pt)	47 b	58 b	30 b	54 b	8 bc	13 b	11 b	15 bc
Nontreated (control)	89 a	100 a	84 a	98 a	55 a	91 a	59 a	88 a
<i>P</i> -value	0.0001	0.0029	0.0001	0.0014	0.0001	0.0001	0.0001	0.0001

*Means followed by the same letter are not statistically different from each other (Fisher's Protected LSD, P=0.05).