

Great Lakes Fruit, Vegetable & Farm Market EXPO

December 5-7, 2006

DeVos Place Convention Center, Grand Rapids, MI



Pepper

Tuesday afternoon 2:00 pm

Where: Grand Gallery (lower level) Room E-F

Recertification credits: 1 (1A, 1B, Comm CORE, Priv CORE)

CCA Credits: PM(1.5) CM(0.5)

Moderator: Jim Breinling, Regional Vegetable ICM Educator. MSU Extension

- 2:00 p.m. Damping-off of Pepper Transplants
Sally Ann Miller, The Ohio State University
- 2:30 p.m. Pepper IPM in New England
Jude Boucher, University of Connecticut
- 3:00 p.m. Phytophthora Research Update in Peppers
Mary Hausbeck, Plant Pathology Dept., MSU
- 3:30 p.m. Spacing Studies in Peppers
Sally Ann Miller, The Ohio State University

***Phytophthora* Research Update in Peppers**

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Michigan State University, Department of Plant Pathology

Michigan has over 79,000 acres of vegetables that are vulnerable to root, crown, and fruit rot caused by the soilborne fungus, *Phytophthora capsici*. *P. capsici* has two mating types that allow for the production of long term survival spores (oospores) and development of genetic adaptations that foster fungicide resistance. The oospores can survive in soil up to ten years without a susceptible crop, and both mating types needed for oospore production have been found in every field sampled in Michigan. This pathogen is favored by rain and warm temperatures that occur during the Michigan growing season and has recently been found in irrigations ponds and other surface water sources. The most effective control measures are to avoid planting in infested soil and limit the spread of the pathogen to clean fields. Crop rotation is difficult as infested acreage and urban pressure is increasing across the major growing areas of the state. Properly constructed raised beds can be helpful as they keep vulnerable plants from saturated soil conditions. Foliar applications of preventive fungicides can be effective if proper coverage and timing of applications can be achieved. Certain fumigants are also available that can help lower crop losses. A combined approach of all available control techniques is more effective than using just one control measure.

Fungicide Trial

New products and one registered fungicide were tested (Table 1). The field was prepared by forming 6-inch raised beds covered with black plastic, with one drip tape per bed. Drip tape emitters were spaced 8 inches apart, calibrated to deliver 0.4 gal/min/100 ft, and operated for 45-minute periods. Preplant drip treatments were applied on 28 May (7 days before transplant). Pepper ‘Camelot’ transplants were planted 24 inches apart into the beds on 4 Jun. Drip treatments were applied on 4 Jun (at transplant), 13 Jul (32 days after transplant), and 25 Jul (29 days before harvest). Foliar sprays applied at 7-day intervals were initiated on 20 Jun. The experiment was harvested on 23 Aug.

Table 1. Products tested

Product	Active ingredient	Labeled
IR6141 50WP	kiralaxyl	no
Remedier 40WP	<i>Trichoderma</i> spp.	no
Ridomil Gold 4EC	mefenoxam	yes
Ridomil Gold Bravo 76WP	mefenoxam + chlorothalonil	no
V-10162 5.73FL	fluopicolide + propiconazole	no

Disease pressure was high at the test site with 25% of the pepper plants showing *P. capsici* symptoms on 13 Jul. Plant death continued to develop throughout the summer with 68% of the untreated plants being dead at the last evaluation date (Table 2). Plants treated with IR6141 50WP 0.21 lb + Remedier 4WP 2.2 lb and V-10162 5.73FL 1.75 pt had significantly less plant death than the untreated control on 18 Aug. Only V-10162 5.73FL 1.75 pt had significantly higher yield than the untreated control.

Table 2. Evaluation of fungicides and applications for management of *Phytophthora* blight of pepper.

Treatment and rate/A	Application	Plant death (%) 8/18	Yield (lb/30 ft of row)
Untreated.....	--	68.8 a*	7.4 b
V-10162 5.73FL 1.75 pt.....	6/4 drench at transplant 6/20 7-day foliar spray	3.8 c	29.5 a
Ridomil Gold EC 1.6 pt	6/4 drench at transplant		
Ridomil Gold Bravo 76WP 2 lb.....	6/20 7-day foliar spray	47.5 ab	9.6 b
IR6141 50WP 0.21 lb + Remedier 4WP 2.2 lb.....	5/28 drench 7 days before transplant 6/4 drench at transplant	27.5 bc	8.8 b
Remedier 4WP 2.2 lb.....	5/28 drench 7 days before transplant 6/4 drench at transplant	57.5 ab	13.0 b
Ridomil Gold EC 25.6 fl oz	6/4 drench at transplant	47.5 ab	12.9 b
IR6141 50WP 2.1 lb	7/13 drench 32 days after transplant 7/25 drench 29 days before harvest	63.8 a	4.2 b
Ridomil Gold 4EC 25.6 fl oz	7/13 drench 32 days after transplant 7/25 drench 29 days before harvest	56.3 ab	7.1 b
IR6141 50WP 2.1 lb	6/4 drench at transplant	51.3 ab	13.3 b

*Column means with a letter in common are not significantly different (LSD; $P=0.05$).

Cultivar Trial

A pepper variety trial was established in a commercial pepper field located near Fremont, MI in a field that has a history of *Phytophthora capsici* infection. Eleven different cultivars were arranged in a randomized complete block design and replicated four times. Existing pepper plants were pulled from 20 ft sections and replaced by 7 week old transplants grown in 128-cell plug trays on 14 Jun. Plants were planted every 12 in. and rows were 24 in. apart. Plots were maintained by the grower cooperater until harvest on 29 Sep. Fruit from the inner 10 ft was collected, weighed, and evaluated for a silvering fruit defect.

None of the plants in the trial died as a result of *P. capsici* infection. All of the cultivars had some level of the silvering defect which is a separation of the outer cuticle from the fruit (Table 3). The cultivar Red Knight had over 25% affected fruit and was blemished enough to be unmarketable. The *P. capsici* tolerant cultivar ‘Alliance’ was least affected by the defect and all the fruit harvested were marketable. The cultivars ‘Camelot’, ‘Aristotle’, and the germplasm line ‘C85XC86’ had defect levels below 10%. There was no significant difference in yields.



PRO5-C71x72

Red Knight

Revolution

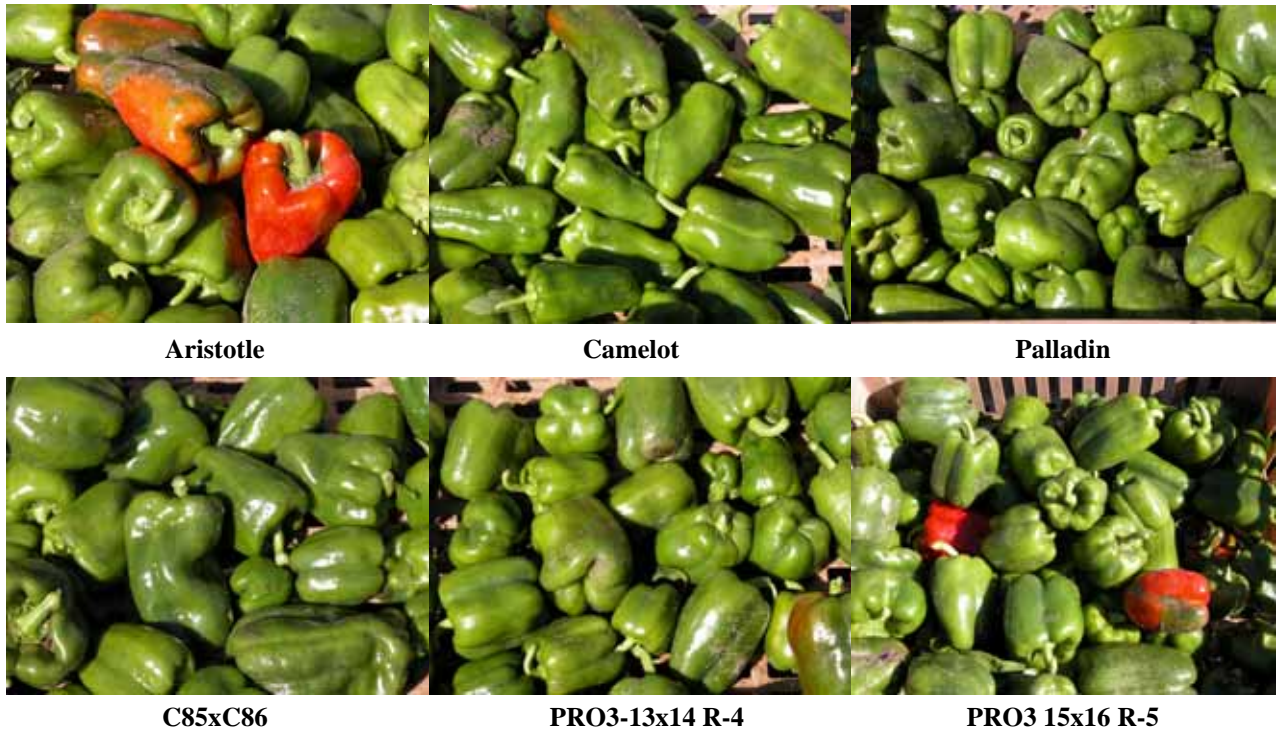


Table 3. Evaluation of bell pepper cultivars for resistance to Phytophthora blight.

Cultivar	Yield (lb/10 ft of row)	
	Fruit with silvering (%)	Total
Camelot.....	9.4 a-c*	12.2
Red Knight.....	26.8 d	9.9
Aristotle	8.6 ab	13.4
C85xC86.....	8.7 ab	13.7
Revolution.....	12.1 a-c	8.4
Alliance.....	7.8 a	13.3
Palladin	17.2 bc	10.9
PRO3-13x14 R-4	15.7 a-c	13.0
PRO3-15x16 R-5	14.1 a-c	14.0
PRO5-C71x72.....	18.4 cd	12.7
PRO5-C81x82.....	13.1 a-c	14.2

*Column means with a letter in common or with no letter are not significantly different (Fisher LSD Method; $P=0.05$).