PEPPER (*Capsicum annum* 'Red Knight')
    Phytophthora blight; *Phytophthora capsici*

M. T. McGrath and Z. F. Sexton
Plant Pathology & Plant-Microbe Biology Section
SIPS, Cornell University, LIHREC
3059 Sound Avenue, Riverhead, NY 11901

Efficacy of biopesticides for managing Phytophthora blight in pepper, 2017.

An experiment with field-grown peppers was conducted at the Long Island Horticultural Research and Extension Center (LIHREC) in Riverhead, NY, in a field with Haven loam soil. The objective was to evaluate a program with a combination of biopesticide products for the control of Phytophthora blight on peppers when compared to conventional fungicides. All products tested are labeled for this disease. Biopesticides were selected to have a full range of available active ingredients. The field was chosen because it has a history of Phytophthora blight. *Phytophthora capsici* proliferation was encouraged the previous season by growing squash and pumpkin throughout the field with no management practices for Phytophthora blight. The field was plowed on 25 Jun. Controlled release fertilizer (N-P-K, 15-5-15) was applied on 28 Jun at 675 lb/A. Plants were seeded in the greenhouse on 15 May and transplanted into the field on 5 Jul. Prowl H20 2.1 pt/A and Reflex 1 pt/A were applied for weed control on 3 Jul using a tractor-mounted sprayer. During the season, weeds were controlled by cultivating and hand weeding as needed. Moisture was provided all season using overhead irrigation. Plots were five 8-ft rows spaced 34 in. apart with 6 plants per row at 16 in spacing. The 20-ft area between plots was not planted. A randomized complete block design with four replications was used. Four applications of biopesticides were made to soil with one to seedling trays (29 Jun) and three while plants were small (13, 20, and 27 Jul). Foliar applications for Phytophthora blight were made on a 7-day preventive schedule beginning on 3 Aug. All nine were made using a tractor-mounted boom sprayer equipped with twinjet (TJ60-11004VS) nozzles spaced 17 in. apart that delivered 72 gal/A at 50 psi and 2.3 mph. Plots were evaluated for Phytophthora blight symptoms on 24, 28, and 31 Aug. At each assessment, all plants within the plot were inspected for Phytophthora symptoms and recorded as a percentage of the total plants. Average monthly high and low temperatures (^{o}F) were 83/69 in Jul, 81/66 in Aug, and 77/64 in Sep. Rainfall (in.) was 3.45, 4.95, and 3.00 for these months, respectively.

An intensive rainstorm on 18 Aug with 3.28 in. rain likely provided favorable conditions for Phytophthora blight. Symptoms were first observed in this experiment on 24 Aug. Wilt caused by crown rot was the primary symptom seen. No treatment was able to significantly reduce the incidence of Phytophthora blight when compared to the untreated control. The rotation of conventional pesticides was numerically the most effect treatment but these results are unreliable due to the high amount of variability between plots.

Treatment and rate/A (application dates) [z]	Application target	Affected plants (%) [y,x]
Untreated control	--	57.0
Bio-Tam 4 lbs + Taegro 4 oz (1,3),	soil	
SoilGard 12G 10 lbs (2,4),	soil	
Actinovate AG 12 oz (5,7,9),	plant	
Regalia 3 qt (5-9),	plant	
Double Nickel 1.5 lb + Cueva 2 qt (6,8)	plant	50.8
Revus 8 fl oz/A (5,7,9)	plant	
K-Phite 1 qt/A (5-9)	plant	
Presidio 4 fl oz/A (6,8)	plant	33.6
P-value (treatment)		0.5945

[z] Rate of formulated product/A. Soil-directed application dates were 1=29 Jun, 2=13 Jul, 3=20 Jul, and 4=27 Jul. Foliar application dates were 5=3 Aug, 6=11 Aug, 7=17 Aug, 8=25 Aug, and 9=1 Sep.

[y] Treatments were not significantly different from each other (Tukey's HSD, *P*=0.05).

[x] Values were square root transformed before analysis because raw data were not distributed normally. Table contains de-transformed values.