

Final Project Report to the NYS IPM Program, Agricultural IPM 2000 – 2001

Title:

Implementing a Management Program for Phytophthora Blight of Cucurbits

Project Leader(s):

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cucurbit growers in each participating county

Type of grant:

Cultural methods; sanitation; physical controls

Project location(s):

Ontario-Wayne-Yates Counties
Lake Plains
Schoharie County
Suffolk

Abstract:

Phytophthora blight is a very devastating disease that has been increasing in importance in New York and elsewhere in the US. It has been identified as a high priority for the IPM program. The main goal of this project was to work with growers in upstate New York to implement a management program developed through years of research and observations on Long Island. Unfortunately, weather conditions were generally not favorable for Phytophthora blight in 2001. Blight only developed in 1 of 3 fields on commercial farms where management practices were evaluated. In that field blight was less where straw was used. Valuable information was obtained about the management practices being used for Phytophthora blight in cucurbit crops by surveying growers.

Background and justification:

Phytophthora blight can strike any time from planting through harvest, affecting leaves, stems, and fruit. Often it does not strike until near harvest after growers have invested a lot of time and resources into the crop. This devastating disease has been described as 'like the plague' and the 'most destructive disease of cucurbits' because 'nothing causes greater loss'. Total crop

loss has occurred in some fields. Within the past 20 years it has gone from being unknown to a serious problem, first on Long Island and in the Capital District, then within the past few years in central and western New York.

Current recommendations center around preventing the pathogen from being moved into a new field and managing soil moisture to avoid saturated conditions which favor disease onset. Prevention is very important because Phytophthora blight is difficult to control once it starts, and after it has occurred on a farm it is challenging to continue growing susceptible crops without Phytophthora blight reoccurring. In addition, it is very difficult to suppress this disease once it starts to develop in a field. Several years of research in Riverhead documented that the fruit rot phase cannot be controlled adequately with fungicides.

Objectives:

1. Discuss the recommended management practices with growers during winter meetings.
2. Examine several farms during the growing season to determine practices being implemented and occurrence of Phytophthora blight.

Procedures:

1. Phytophthora blight and recommended management practices were described to growers during meetings conducted in New York during winter, 2001: the 2001 New York State Vegetable Conference in Syracuse on 15 Feb, and the Western New York Vine Crops Pest Management Workshop in Rochester on March 1. These topics were also covered in meetings conducted elsewhere: 2001 Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA, on 1 Feb and the Phytophthora Workshop in Chicopee, MA, on 27 Feb. The two workshops provided good opportunities to discuss Phytophthora blight management with growers. These growers were asked to fill out a questionnaire noting which practices they have been using and which they feel are feasible. An article on managing Phytophthora blight was prepared for grower newsletters.

2. Management practices for Phytophthora blight were implemented on 1 farm in each of three counties where Phytophthora blight had affected pumpkin previously. Additional farms were scouted for blight. The practices implemented on each cooperator's farm were as follows (* indicates practice implemented in part of the field to allow evaluation):

Ontario County

Rotation

Sanitation (equipment was cleaned)

* Soil deep ripped / chiseled before planting

* Straw mulch

* Application of the fungicide Acrobat (Section 18 obtained for 2001)

A very small field on Pedersen's home farm west of Geneva on Co. Rd. 4 that had pumpkins with Phytophthora infection in 2000 was used for the trial. It was planted 9 June after all their other fields were planted. All equipment had been cleaned the previous fall to remove soil / debris. Standard protective insecticides and fungicides were used as needed for cucumber beetles and powdery mildew, etc., on a good schedule.

Four strips in the field were deep ripped / chiseled before planting and two strips were not. Straw was spread in early July on one of the strips that was not ripped, in the center of the field. Acrobat was applied on 26 June to two strips on the west end of the field which included one strip that was ripped and one that was not.

Rainfall during the season:

May -	2.8"
June 16 -	2.7"
June 21-27	1.65"
July -	2.0"
August -	2.6"

Schoharie County (Mattice's Riverbank Farm)

Rotation

Well-drained soils

Switching from potentially contaminated irrigation pond water

* Plastic mulch in the row, straw or living mulch between rows, + crown setting varieties

Plots consisted of 4 30' rows. Treatments were replicated 4 times. Fertilizer was spread and plastic laid on 20 June. Plots were direct seeded by hand on 26 June with the variety Racer (2 seeds per hill). Plots were thinned to two plants per hill where necessary on 10 July. Oats were seeded between the rows receiving that treatment on 10 July at approximately 2 lbs per plot. Seed was purchased from Agway in Cobleskill.

Monroe County (Martin Farms)

Rotation

Well-drained soils

Avoid over irrigation

* Application of the fungicide Acrobat (Section 18 obtained for 2001)

* Subsoiled twice

The project was conducted on a 24-acre field that was divided into 8-acre sections and seeded to acorn squash. At Martin Farms, squash is on a 5-year rotation (squash, peas, soybeans or wheat, field corn, cabbage and squash). The squash fields are prepared by disking in the cabbage in the fall and spring plowing. Just before seeding the field is broadcast fertilized, harrowed and cultipacked, and seeded. Preemergent herbicides are applied after seeding. The plants are sidedress fertilized when they are just about ready to vine. For pest control, insecticides are used as needed and a preventative fungi program (7-10 day schedule) is started as soon as powdery mildew is found in the field.

Martin Farms have been using the following management practices to minimize the occurrence of Phytophthora blight. Whenever possible they select well-drained fields and all their squash fields are on a 5-year rotation, four years where a susceptible crop has not been grown. They also avoid over irrigation and maintain a 7-10 day preventative fungicide program once powdery mildew starts. Additional management practices they may be interested in incorporating are: routine field scouting for symptoms and when symptoms are found, disking of small-localized areas or removal of plants and fruit from the field.

The acorn squash field used for the project was sown on June 15 and each 8-acre section was treated differently. Two sections were handled following Martin Farms standard culture and management practices except that one of the sections received Acrobat every two weeks for a total of two applications in addition to the regular preventative spray program. The last section also received the Acrobat applications and was subsoiled before seeding and when the plants were ready to vine. Because it was such a dry year only 4 fungicide applications were made at variable intervals. Rainfall for June was 1.5 inches, for July 1-1.5 inches, for August 2.5 inches and for September 3.0 inches. The spray program began on July 27 with Acrobat, followed by Nova on Aug. 6, Acrobat again on Aug. 11 and copper on Aug. 25. The fields were harvested

the week of October 2nd and on October 10th; nine plots (50 feet by 5 feet) from each treatment were evaluated for plant stand, total unmarketable fruit, and the fraction of fruit that were diseased.

Suffolk County

Phytophthora blight occurrence and management were examined at 4 sites.

Results and discussion:

1. Valuable information was obtained about the management practices being used for cucurbit crops by surveying growers attending the Western New York Vine Crops Pest Management Workshop (Table 1). Scouting was the most common practice. All growers scout. Almost all growers practice long rotations of at least 3 years. Several practices were identified as not feasible by most growers: using a land plane to level fields, preparing raised beds and beds without depressions for summer squash, fumigating soil, making trenches between rows at their end to allow water to leave the field, and avoiding major irrigation leaks or overirrigating.

The article on managing Phytophthora blight prepared and distributed for use in grower newsletters is included in Appendix 1.