Project #: LNE01-154 - Final Rpt for LNE99116 (continued in 01-154)

Farm Ecosystem and Management Factors Contributing to Pest Suppression on Organic and Conventional Farms

Summary:
Organic farmers report a reduction in pest pressure after a number of years of organic production. Our goal in this project is to identify and quantify relationships between farm management practices, soil quality, and pest populations on mixed vegetable farms. We are sampling extensively in potatoes and winter squash on four organic and four conventional farms throughout New York to characterize crop management practices, pest and beneficial complexes, a variety of soil characteristics, weed species and density, and field border flora and fauna. We also conducted educational programs for organic vegetable growers, and trialed pest management materials approved for organic production. This project is a continuation of project number LNE99-116.

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Project Duration: March 1, 2001
February 28, 2003

Date of Report: December 20, 2001

Objectives:

A. Explore the relationships between farm management practices, soil quality, farm landscape, and pest populations in two vegetable crops on organic and conventional farms. Estimate costs of production for the two crops on each cooperating farm.

B. Develop and present educational programs for organic vegetable growers.

C. Research and demonstrate new or unfamiliar pest management techniques and products allowable on certified organic farms.

Accomplishments/Milestones

A. Extensive sampling is being conducted in potatoes and winter squash on four certified organic and four conventional mixed vegetable farms. We are sampling insect and disease pests, beneficials, weed populations, a number of soil quality factors, field edge flora, and surrounding vegetation. We have successfully completed the second season of data collection, and data analysis is ongoing.

B. A three-day series of educational programs on organic vegetable production was presented in February and March of 2001. The first day focused on soil and nutrient management, the second on weed management, and the third on insect and disease management. The mix of university and grower speakers was very well received by the audience. An average of 75 people attended each session.

C. Trials were conducted to look at the efficacy of OMRI approved pest management materials against insect pests reported by growers to be problems in organic production. The target pests were crucifer flea beetle on broccoli, cabbage aphid on broccoli, potato leafhopper on potato, onion thrips on onions, early blight on tomato, and Rhizoctonia black scurf on potato.

Impacts /Outcomes

A. We are still in the exploratory phases of our data analysis and are not able to draw firm conclusions about our findings. The following is based on our 2000 data only. We found that while there are differences in the average values of the variables we measured, organic and conventional farms did not fall out into two separate groups, but rather the range of values overlapped for most variables. Seasonal averages of many pests were higher on organic farms, and yields were lower. Aphids are a striking exception to this, with much lower numbers in organically managed fields. We have not reached the stage of correlating pest and nutrient levels with yield to determine what factors are contributing to the lower yields. Organically managed soils had higher organic matter content, higher microbial activity, and higher nitrogen mineralization rates. Root knot nematodes (Meloidogyne spp.) were higher in organic fields, while root lesion nematodes (Pratylenchus spp.) were lower. Numbers of saprophytic nematodes were higher in organic fields. We are looking forward to further exploring our data to see if the 2000 observations are consistent with subsequent years and to look for relationships between variables.

B. Because of audience interest, the organic vegetable production series will be repeated, with minor changes, in January of 2003.

C. Because of space limitations, detailed results of the trials are not presented here. The results will be presented in articles in New York and Northeast NOFA newsletters as well as local extension newsletters and on a web site containing information for organic growers that will be created by the Northeast Organic Network (NEON). We did find OMRI approved materials that provided reduction of cabbage aphid numbers and crucifer flea beetle damage on broccoli, and early blight on tomato compared with the untreated controls. We did not

find any materials that were protected daughter tubers from Rhizoctonia black scurf on potato when infested tubers were planted, or a material that was effective against potato leafhopper on potato. The thrips trials are still in progress in the greenhouse.

Appendix 3.

Organic Vegetable Production: Soil and Nutrient Management. February 27, 2001, Geneva, NY. Approximately 75 people attended.

Organic Vegetable Production: Weed Management. March 20, 2001, Geneva, NY. (snow date) Approximately 75 people attended.

Organic Vegetable Production: Insect and Disease Management. March 13, 2001, Geneva, NY. Approximately 75 people attended.