

Pumpkin Demonstration for Adopting IPM Practices in New Jersey

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Introduction

The Rutgers Cooperative Extension Vegetable Integrated Pest Management (IPM) Program, in cooperation with the northern New Jersey agricultural agents, has been developing, testing, and implementing a protocol for scouting pumpkins for growers in the northern part of the state. Research and on-farm demonstrations revealed the potential for pesticide reductions as a result of scouting fields and treating at recommended threshold levels of insects and diseases. The benefits of pumpkin scouting and the use of pest action thresholds include cost reductions associated with fewer fungicide and insecticide applications, the potential to reduce or avoid the development of disease resistance, and the capability of addressing societal concerns related to pesticide reduction.

The Importance of Pumpkins in New Jersey



- ✓ 2,500 acres grown statewide
- ✓ Cash receipts of \$5,000 or more per acre
- ✓ One acre of pumpkins may produce up to 25 tons of fruit
- ✓ A key component of the growing farm entertainment industry
- ✓ Sold fresh market to large urban populations



Program Development

- > Variety and pest management research trials on Rutgers Snyder Research and Extension Farm since 1999;
- > North Jersey Pilot Pumpkin IPM Program demonstrated on seven farms in 2000;
- > Fee-based Pumpkin IPM Program offered to North Jersey farmers in 2001 and nineteen growers enroll;
- > An EPA grant provides funding to demonstrate the North Jersey Pumpkin Scouting Program to five South Jersey growers in 2001.



Powdery mildew lesions on a pumpkin stem, leaf, and in a field.

Images from "Identification and Management of Pumpkin Diseases" by R. Latin and K. Rane.

Pumpkin Diseases and Insects

Powdery mildew (*Sphaerotheca fuliginea*)

- A foliar fungus that causes defoliation, resulting in reduced yields and fruit quality.
- Examine 2 mature leaves on 50 plants.
- Begin fungicide schedule at threshold level = 1 lesion/50 mature leaves (McGrath 1996).

Striped cucumber beetle (*Acalymma vittatum* F.)

- Feeds on plants and fruit; transmits bacterial wilt.
- Count the number of beetles on seedling plants; examine fruit for the presence of beetle feeding.
- Treat seedling plants if 2+ beetles are present in 6 sites; treat if beetles are feeding on fruit.

Downy mildew (*Pseudoperonospora cubensis*)

- A foliar fungus that causes severe defoliation, resulting in yield loss.
- Scout fields for presence of disease; monitor the North Carolina State University Cucurbit Downy Mildew Forecast web site.
- Treat if disease is forecasted or present in field.

Phytophthora blight (*Phytophthora capsici*)

- Soil borne pathogen that causes severe yield loss from plant wilt and fruit rot.
- Scout for presence of disease in field.
- Rotate fields from other host crops, avoid fields with poor drainage, treat with protective fungicides if disease is present in field.

Occasional pests:

- Bacterial leaf spot
- Gummy stem blight
- Scab
- Squash bugs
- Aphids, Thrips
- Spider mites



Highlights and Successes

Fungicide and insecticide reduction was demonstrated through research and on-farm trials. Grower participation in public and private pumpkin scouting programs has increased significantly as a result of the economic benefits realized.

North Jersey Research Trials:

- ✓ Through the use of disease scouting and varietal resistance for powdery mildew, fungicide reduction was demonstrated. Optimizing the initiation of the fungicide program reduces selection pressure on systemic and strobilurin fungicides.

Cost Benefits of Reduced Pesticide Use

1 fungicide application = **\$17 - \$31** per acre

1 insecticide application = **\$7 - \$10** per acre

2000 North Jersey Pilot IPM Program Demonstration:

- ✓ Seven farms participated in a demonstration with conventional and IPM field treatments
- ✓ Disease scouting **reduced 1-4 fungicide applications** compared to the standard recommendation; few fields reached insect action thresholds.
- ✓ Due to immediate benefits realized, an EPA Grant of \$40,000 was obtained to demonstrate pumpkin scouting in South Jersey.

2001 North Jersey Pumpkin IPM Program:

- ✓ Nineteen farms enrolled 31 representative fields at a cost of \$300 plus \$25 per acre. Recommendations from 141 scouted acres impacted 350 total pumpkin acres.
- ✓ Disease scouting resulted in delayed initiation of fungicide applications by nearly 3 weeks, **reducing fungicide use by 2 to 3 applications**.
- ✓ Insect action threshold were reached only 8 times over 31 fields, and many fields did not need any insecticide applications.

2001 South Jersey Pumpkin IPM Demonstration:

- ✓ One to two fungicide and 2 insecticide applications were reduced on IPM blocks with no significant differences in marketable yield and fruit weight compared to conventionally treated blocks.
- ✓ Additionally, fungicide initiation was delayed 1 to 2 weeks on most farms and up to 4 weeks on one farm.



References:

McGrath, M.T. 1996. Successful Management of Powdery Mildew in Pumpkin with Disease Threshold-based Fungicide Programs. Plant Dis. 80:910-916.