

Search for Excellence in Crop Production
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STOPPING A SILENT INSECT KILLER OF PUMPKIN AND SQUASH PLANTS THROUGH IPM MONITORING

Educational Objectives

Squash vine borer [*Melittia cucurbitae* (Harris)] is a destructive pest of most types of squash and pumpkin. Damage can be severe, and growers can be surprised and confuse by the damage.

The Squash Vine Borer (SVB) Integrated Pest Management (IPM) program was initiated to address the concerns of both farmers, and giant pumpkin growers and gardeners, regarding pesticide use on pumpkin, winter squash and summer squash. The program has introduced pest monitoring strategies and economic action thresholds for SVB insect pest and utilizes applied research to evaluate the need of spraying to manage this pest, and timing of needed sprays.

Pumpkin, winter squash and summer squash comprise nearly 20% of the vegetable acreage dedicated to fresh vegetable production in New Hampshire. Prior to the IPM program described here, control of SVB has been based strictly on calendar-based sprays. This resulted in significant pesticide use and expense. Some of the largest giant pumpkins grown in the world are from New Hampshire, so this specific group was also included in the project.

This program employs monitoring pheromone lured traps and scouting crop plant damage to allow for precision timing of pest control measures. Introducing NH growers to IPM strategies for controlling SVB was based on fulfilling the following objectives:

1. Growers will increase their awareness and understanding of SVB and will minimize pesticide use by basing spray decisions on insect population thresholds rather than preventative, calendar-based sprays.
2. Giant pumpkin growers and gardeners will increase their awareness and understanding of SVB to their crop and have a better understanding of timing of pesticide applications.

Program Activities

Objective #1 - Growers

Funds for development of this program were secured from the New Hampshire Department of Agriculture, Markets and Food - Division of Pesticide Control.

With these funds, Extension Field Specialist (Hamilton) hired and trained an IPM scout (Kunhardt) in SVB identification, monitoring techniques and management recommendations. With input and collaboration from local grower associations [New Hampshire Vegetable & Berry Growers Association (NHVBGA) and New England Vegetable & Berry Growers Association (NEVBGA)], an average of 17 farms per year in

southern NH were established as scouting sites. Working with Hamilton, Kunhardt visited each farm one time per week to monitor insect pest populations by deployment of pheromone traps and field scouting. Both were in regular contact with the farmers to educate them in SVB monitoring procedures, update them on the pest situations in their fields, and give appropriate management recommendations.

Growers located outside the core study area also expressed interested in participating in the program. An alternate program was developed for an additional six to seven growers per year. Those growers were provided traps and lures along with instructions for independently trapping and scouting. Growers would email or text weekly trap counts to Hamilton who would respond with recommendations. Farm visits were conducted by Hamilton as needed.

Objective #2 - Giant Pumpkin Growers

Working with the New Hampshire Giant Pumpkin Growers Association (NHGPGA) and New England Giant Pumpkin Growers Association (NEGPGA) an average of 22 growers utilized an average of 30 traps. The methods utilized for this group mirrored those used with the growers outside the core study area as described above. A weekly SVB update was sent to each grower throughout the growing season.

Teaching Methods:

Annually, SVB insect pest situations and scouting/trapping methods were presented to growers during vegetable and berry growers' annual winter meetings of the NHVBGA, NEVBGA and others Agriculture Businesses' meetings. At spring and summer twilight meetings held on participating farms, scouting methods and pheromone trapping were demonstrated. Growers visited our web page to download factsheets regarding SVB pest information, scouting/monitoring, and spray thresholds.

During the growing season, participating farmers received one-on-one training with Hamilton and Kunhardt regarding the insect monitoring practices used, spray thresholds, and record keeping. Data from participating farms and individuals, as well as management recommendations, were shared with growers throughout the state via our website keeping non-participating growers informed of the current pest threats in their area and encouraging them to scout their own fields to determine optimal timing for any needed sprays. Weekly emails were sent to participating growers.

Results:

Objective #1 - Growers

- Average of 24 farms participated in the program.
- 277 individuals attended seven meetings where SVB IMP was discussed.

- If drastic increases in pest numbers were observed, notifications were made by special notices in statewide grower newsletters.
- Trap counts were listed on the UNH Extension IPM website.
- Observations shared on weekly zoom meetings including university researchers and extension staff throughout New England and New York region.

Objective #2 - Giant Pumpkin Growers

- Average of 22 individuals participated in the program.
- 283 individuals attended 11 meetings where SVB IPM was discussed.
- SVB trapping/monitoring was discussed at one webinar with 27 participants.
- Weekly SVB Update sent to each grower throughout growing season.
- NHGPGA and NEGPGA organizations shared SVB information with members via emails and e-newsletters.

Impact Statement

Objective #1 - Growers

- Average of 24 growers participating in the program:
 - Planted an average of 297 acres of pumpkin, winter squash and summer squash per year.
 - Harvested an average of 262 acres.
- Average of 34.42% of total acreage harvested in NH (USDA NASS).
- Growers in IPM program sprayed average of 2.64 fewer sprays (2018 to 2020) compared to prior practices resulting in yearly average savings of:
 - \$11,715 for pesticides (average of 195 Gallons of Pesticide Not Sprayed If Growers Used the Same a Product Requiring One Quart Per Acre)
 - \$19,526 for labor and equipment costs
- Total SVB IPM Program financial impact: \$31,241 per year.
- Three-year Total program financial impact: \$93,723.

Objective #2 - Giant Pumpkin Growers

- Giant Pumpkin Growers/Gardeners reported an average of 19% plant die-back compared to 75% prior to the program.

Evaluation:

A detailed program evaluation survey was conducted with each farmer or giant pumpkin grower at the end of the season.

Objective #1 – Growers

- All growers reported confidence in the spray recommendations provided. Ten farms reported that they shared their trapping information with others, ultimately reaching an additional 23 growers each year, on average.
- Growers were asked how their management practices have changed as a result of the current IPM Program (100% responding). Top responses include:
 - Proper timed sprays (66.2%)
 - Alerted to pest pressure (58.43%)
 - Saved time (56.55%)
 - Pay more attention to SVB (48.25%)
- Growers were asked if there was any financial impact as a result of the IPM program. Top responses include:
 - Pay more attend to details (60.42%)
 - Saved money (58.33%)
 - Good increase to profitability (51.89%)
 - Increased marketable crop yield (51.70%).
- Hamilton met annually with advisory panel of participating growers to discuss and refine the program.

Objective #2 - Giant Pumpkin Growers

- All giant pumpkin growers/gardeners expressed positive results by participating in the SVB program. The top responses include:
 - Pay more attention to SVB (100%)
 - Alerted to pest pressure (88%)
 - Reduction in plant die-back (81%)
 - Proper timed sprays (80%).
- NHGPGA and NEGPGA organizations shared SVB information and weekly trap counts with members via emails and e-newsletters.
- Hamilton met with NHGPGA and NEGPGA leadership to discuss and refine the program.