"Final Project Report to the NYS IPM Program, Agricultural IPM 2003-2004"

1. Title:

Trials for the Evaluation of IPM Procedures to Control Insects on Early Season Sweet Corn

2. Project Leader(s):

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3. Cooperator(s):

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4. Type of grant:

Pheromones; biorationals; microbials; conventional pesticides

5. Project location(s):

Washington and Albany Counties, applicable throughout the Northeast.

6. Abstract:

A common technique in cold climates to speed maturity in sweet corn is to start the corn under plastic or floating row cover. Once the corn is from one to two feet tall, the plastic or row cover is removed. Because it is so much farther advanced than sweet corn planted on bare ground the crop attracts early season european corn borer (ECB). Scouting for insect damage is difficult or impossible because the larvae are deep in the plant. Working with two large-scale growers of row cover sweet corn, a successful technique for insect control was identified. Pheromone traps next to the fields are used to monitor early season flight patterns. At flight peaks, the grower waits 3 to 4 days, than applies an insecticide spray. After another 3-4 days, a second insecticide application, if needed, is made. No further applications are necessary. After three years of informal observation, a formal trial was set up in 2002. With 2003 data collection, our confidence in the process is strengthened. Growers have developed the growers conducting the trial have confidence in using this technique and have achieved both high quality early sweet corn and minimal pesticide applications

7. Background and justification:

Over the years, IPM techniques and recommendations for the control of insect pests on sweet corn have developed from research by Cornell faculty, Cooperative Extension educators and growers trying different ideas. For early corn (Corn maturing before the first week of August), the IPM recommendation is to scout the field, and if over threshold, apply a control when the corn is just coming into tassel. Sweet corn growers found out the hard way this technique did not work with row cover/plastic sweet corn. Because the row cover/plastic corn is so much more advanced than all other corn

around, european corn borer (ECB) adult moths are attracted to that corn first. Larvae are deep in the plant and even if it is scouted, sign of the larvae is nearly impossible to find. If row cover/spastic corn is sprayed at tassel, it is too late and larvae damage will be found on the corn. Spraying whorl stage corn is a hit of miss proposition. The two growers participating in this trial have significant acreage in early season row cover sweet corn. They were interested in finding a solution to the early season insect problem. Working with these two growers we tried monitoring ECB flights and applied a treatment when the flight spiked. Over three seasons, of informal trials, this technique seemed to work. In 2002, we formalized the trial, collected data and found it to be effective as well. Results for 2003 proved equally effective.

It makes sense to time sprays on the corn when insect activity is present. By having pheromone traps next to fields and monitoring those traps, it is possible to know when ECB moths are laying eggs. Normally the eggs hatch three to six days after deposition. The goal is to make a spray application when the eggs hatch but before the larvae dig deep into the plant. If you know when the ECB flight is heavy then it is possible to predict when the most number of eggs will be hatching on the corn plants. For this project, we wanted to see if it is possible to base successful early season row cover/plastic sweet corn insect control decisions on pheromone trap catches.

8. Objectives:

1 - To increase the sweet corn grower's ability to make sound ecological and economic insect control decisions.

2 – To continue obtaining data that will allow for the development of IPM early season sweet corn recommendations.

9. Procedures:

Two growers participated in this trial. Each grower divided an early season row cover sweet corn field into two sections. One section was the check (no sprays), the second section was sprayed according to pheromone trap catch results.

Each field had an ECB trap located next to it. Traps were checked weekly by the field scout and also by the grower.

When the ECB trap catch numbers increased, the growers waited 3-4 days, then made a pesticide application. Normally, the grower will wait another 4-5 days after the first application and make a second application. This year, both growers only made one spray application. These were the only spray applications made. There were no sprays made in the check portion of the fields.

Evaluations were carried out in both the sprayed sections and the no spray checks. First, we chose five random rows in each section. In each row, we inspected one hundred plants for ECB damage, focusing on the tassel. This gave us a sample size of 500 plants in each treatment. We then randomly harvested 100 ears from each section and inspected for ECB damage. We felt this gave us a true picture of the treatment effectiveness.

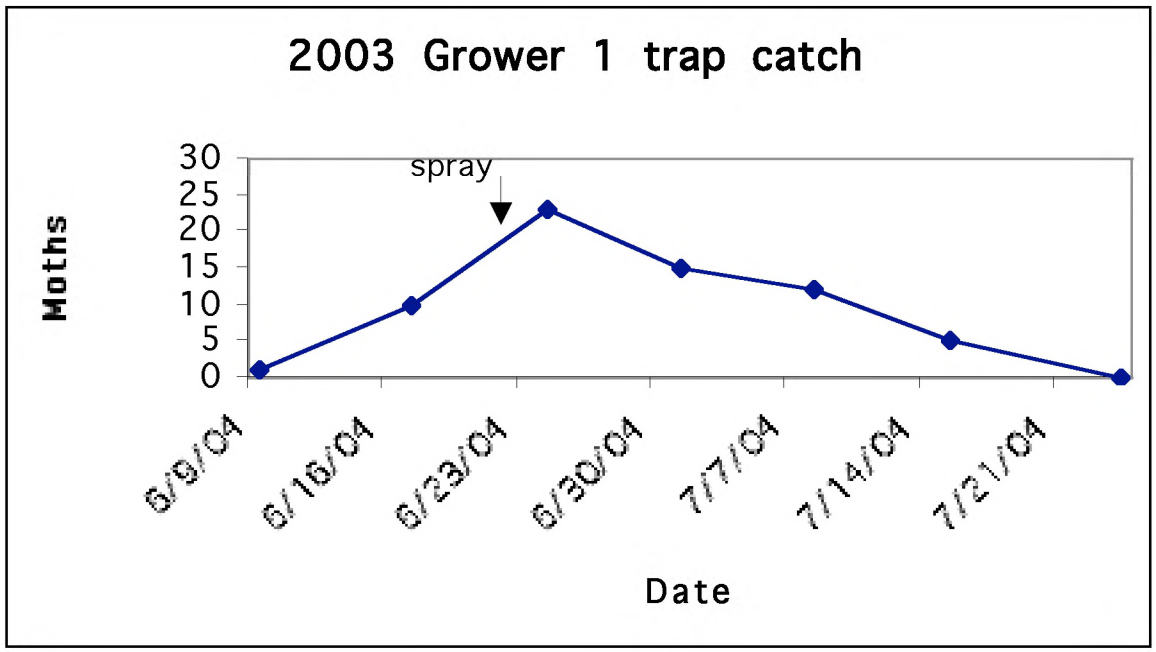
10. Results and discussion:

Grower 1

In 2002, grower one had lower trap catch numbers than grower two and at the time we attributed this to his being located 50 miles farther north than grower two. For 2003, grower one had the higher trap catch numbers. Watching his traps, he decided to apply a spray on June 27, as the numbers increased. This turned out to be a couple days just before peak trap catch numbers. Normally, a second spray would be applied but the grower felt his numbers were low enough to skip the second spray. This technique also depends on a grower knowing his crop, scouting and the grower making decisions that he will be comfortable with. The grower was happy with his results and felt harvesting by hand,

Both growers have been working with me for what is now five years on this technique. They have a feel for the process and it works well for them.

Grower one says he has come to rely on IPM techniques on his farm. It makes sense to monitor the insects and spray only when they are present. The grower still makes the decisions and he gets good results.



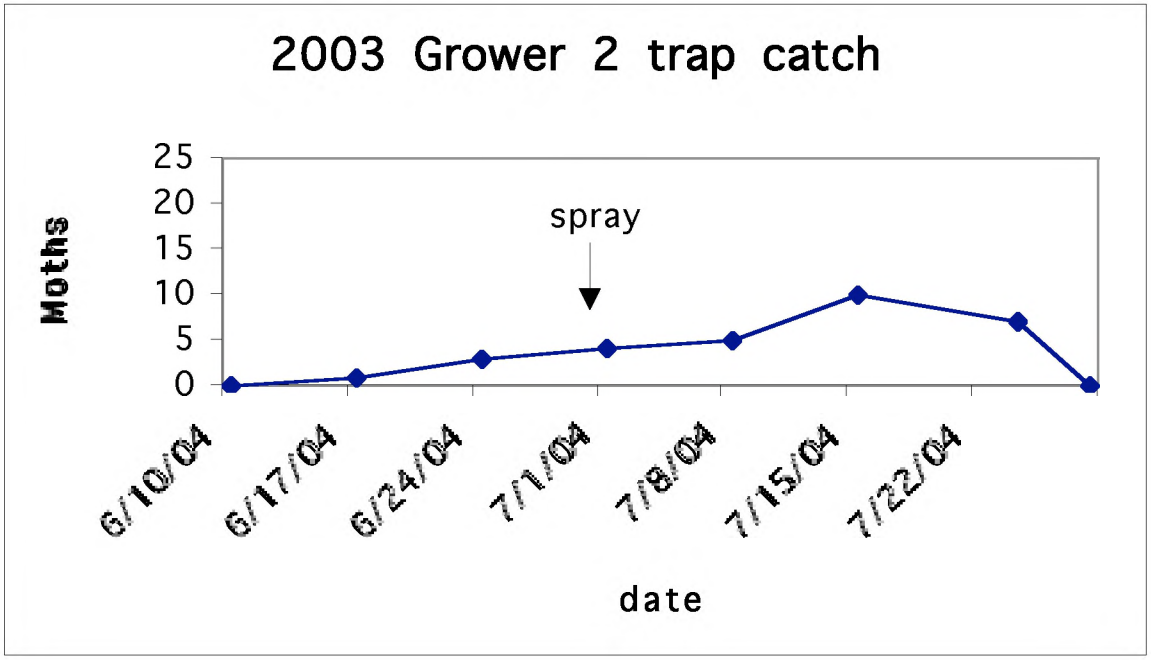
Grower #1

Unsprayed check		Timed Spray – 1 spray	
Tassel damage	6/500 = 1..5%	Tassel damage	5/500 = 1%
Ear damage	3/100 = 3%	Ear damage	1/100 = 1%
0 worms found		0 worms found	

Grower 2

This year, grower two had the lower trap catch numbers. Being in communication with the grower, the scout indicated trap catch numbers were increasing at other locations. Grower two made his spray application at the same time, June 28, as grower one. Again, it must be stated, growers need to follow all available information. Flights can be different in other locations and growers need to take this into account when making decisions. As it turned out, there was more tassel damage and a little higher ear damage at this location but the grower still felt he got good results. When a grower is harvesting by hand, ear selection in the field weeds out bad ears.

Grower two very much likes this technique. He sprays less than he used to and he saves money while still having the quality he wants.



Grower #2

Unsprayed check	Timed Spray – 0 sprays
Tassel damage - 74/500 = 15 %	Tassel damage - 43/500 = 8.6 %
Ear damage - 8/100 = 8 %	Ear damage - 5/100 = 5 %
6/8 worms found	2/5 worm found

The growers feel this technique is logical. Monitor the insects and spray when they are on the crop. It took a while for growers to accept other IPM recommendations after doing it their way for so long. Now that the growers have a feel and trust IPM, they see

it is not guessing but based on real science. That being said, it is still the grower who makes the decisions based on his experience and feel for what is in the field.

Spray applications are based on good information and not calendar based spraying. We have done this trial informally for 3 years and now two years taking data. We would like to continue formally studying this technique for another year to be comfortable putting this into the Cornell IPM recommendations.