

"Final Project Report to the NYS IPM Program, Agricultural IPM 2002-2003."

1. Title:

Early season insect control in sweet corn when using row cover

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 is made. No further applications are necessary. Three years of informal observation and one year of data collection have confirmed the results. Growers have developed confidence in using the technique and have achieved both high quality early sweet corn and minimal pesticide application

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. This technique does not work for row cover or plastic sweet corn. 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 have monitored ECB flights and employed this treatment informally over the last three years with success. The purpose of the grant was to formally collect data and perform a controlled study.

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 obtain 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 at least twice weekly.

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. Grower one felt the flight numbers were so low, he only made one spray application. Grower two had very high trap catch numbers. In his field, after he made the first application, he waited 4-5 days and then made a second 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

The two growers participating in this trial are located north and south of each other. Grower 1 is located in Washington county and is 50 miles farther north than grower 2 who is located in Albany county. Normally, this does not make too much difference in trap catch information. This past summer we had a very wet, cool spring. With these conditions, flights are often delayed and we saw this happen in the more northern location. For most of June, at the Washington county location, trap catch numbers were abnormally low. This made the grower nervous so when the trap catch numbers started to climb further south, he put on his first spray. Trap catch numbers were lower than normal and he chose to apply only one spray. This was applied on June 25th. This was about a week to ten days later than he normally makes his first application. As it turned out, his timing may have been perfect.

Here is what Grower 1 had to say about the trial.

“Row cover corn is a challenge for ECB control because of the maturity. With the traps and scouting, we learned to be very confident with the timed sprays. IPM is an excellent insurance and piece of mind knowing applications are done at the correct time and will not be excessive. I have saved a lot of money doing IPM”

Grower #1

Unsprayed check

Tassel damage - $84/500 = 17\%$

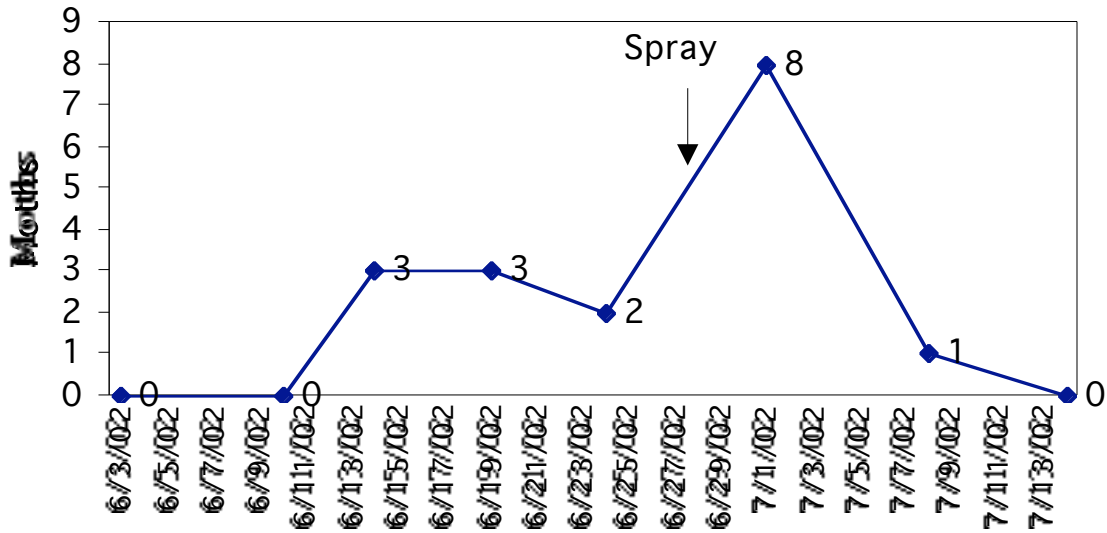
Ear damage - $8/100 = 8\%$

Timed Spray - one spray

Tassel damage - $37/500 = 7\%$

Ear damage - $2/100 = 2\%$

Grower 1 Trap Catch



Grower 2

Grower 2, being further south had an earlier and a much heavier flight. The “spike” in the trap catch numbers occurred the week of June 17. The grower applied his first spray on June 23. He followed with a second spray on June 28. Both growers have been employing this technique for 3 years and are pleased with the results.

Grower 2's comments

“Timed sprays on row cover have the same effectiveness as multiple sprays of whorl stage corn. Any time I can spray less, I like it.”

Grower #2

Unsprayed check

Tassel damage - $268/500 = 54\%$

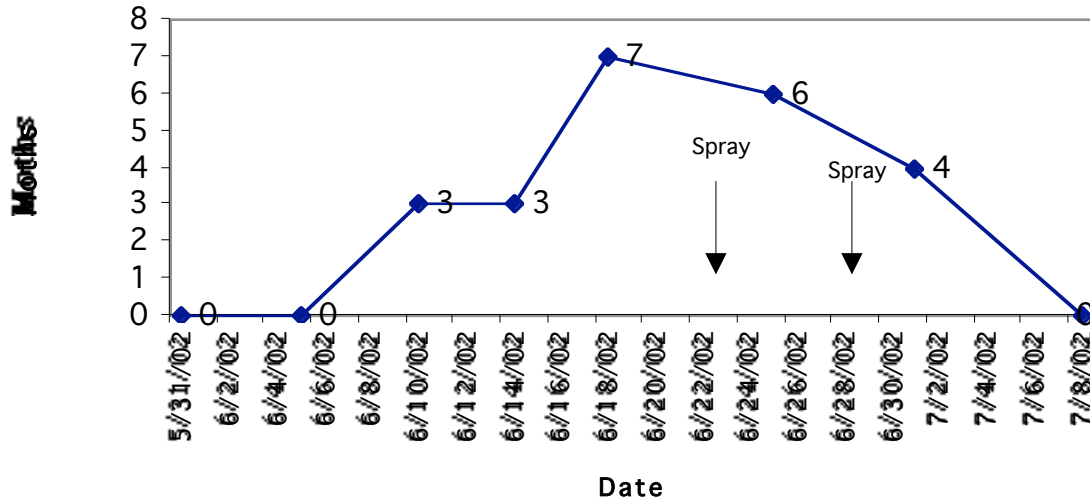
Ear damage - $24/100 = 24\%$

Timed Spray – Two sprays

Tassel damage - $59/500 = 12\%$

Ear damage - $16/100 = 16\%$

Grower 2 Trap catch



The data shows we made significant reductions in both the number of damaged tassels and ears. This approach, monitoring the flight and then spraying after a spike in the flight is very common sense. As stated earlier, growers used to begin spraying when the corn was in whorl stage and continue through tassel. Sometimes, this would involve 4-5 spray applications. Since early sweet corn is the most valuable, it was felt these multiple spray applications were justified. This technique is true IPM. We monitor the crop growth stage and the insect population. Spray applications are based on good information and not calendar based spraying. We have done this trial informally for 3 years prior to this formal one. We would like to continue formally studying this technique for another two years to be comfortable putting this into the Cornell IPM recommendations.