

**Title:**

Early Season Insect Control in Sweet Corn when using Row Cover

**Project Leader:**

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**Cooperator(s):**

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**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. Over the last 3-4 years, 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, then applies an insecticide spray. After another 3-4 days, a second insecticide application, if needed, is made. No further applications are necessary.

During the summer of 2004, we attempted to duplicate previous work with the two growers. Monitoring the pheromone traps, we kept waiting for a peak. The peak never came and we therefore never sprayed the row cover corn. Prior to harvest, an evaluation for insect infestation was carried out and we found very low levels of infestation, 5-6%. Both growers found this level of infestation acceptable. These growers direct market their corn and basically screen out bad corn when hand picking and when they put the corn out for purchase. This is true IPM, through monitoring insecticidal sprays were avoided.

**Background:**

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/plastic 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 and 2004 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.

In 2004, insect flight levels were very low. Without the pheromone traps, it is impossible to know if the flights are low or not. Previously, we have always sprayed when we detected a spike in the flight. This past year we kept waiting and waiting for the flight to occur. Only in hindsight were we able to say exactly when the “spike” occurred.

#### **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.

#### **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 to be 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. During late May and early June, the traps were checked at least twice and sometimes daily.

When the ECB trap catch numbers increased, the growers normally wait 3-4 days, then made a pesticide application. Then, the grower will wait another 4-5 days after the first application and make a second application. This year, we kept waiting for a spike in the flight and therefore never sprayed 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.

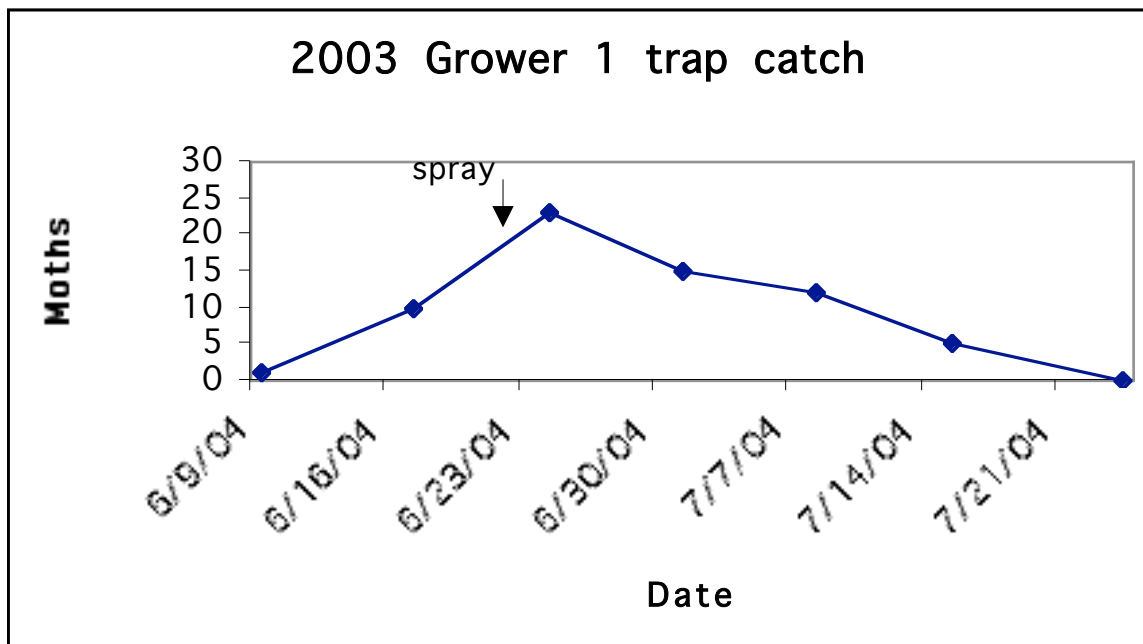
#### **2004 Results and discussion:**

Both growers saved at least one insecticidal spray application on a total of close to 20 acres of sweet corn. A harvest evaluation was carried out in only one of the trial fields. One of the trial fields was harvested before we could get to it. The grower reported he did not notice ECB damage and had no complaints from his customers.

In the other trial field we were able to evaluate. Looking for and finding ECB damage was very difficult as there was very little damage in either the check or the “non-treatment” sections of the field. For external damage, we found less than 10% in both sections. Examining 110 randomly selected ears, we found 6 ears with ECB. The grower was very happy with that level of damage and said he had not noticed any damage in his picking or at his stand.

A further proof of the low first flight insect levels was found later in July. Normally, ECB likes to deposit eggs on the most mature corn. Growers always employ multiple plantings to insure adequate supply throughout the summer. Prior to the beginning of the second flight, the earliest corn has more damage than corn planted later. There can be a window just before the second flight begins where the corn is fairly clean of ECB infestation. This year, that window lasted about two weeks before the second flight began around the last week of July. Both participating growers scout their bare ground fields and spray when threshold levels are reached. Both growers reported not spraying for the two weeks prior to the second flight.

The two participating growers have been working with IPM for over five years on this technique. They have a feel for the process and it works well. The growers say they have come to rely on IPM techniques on their farm. It makes sense to monitor the insects and spray only when they are present. The growers still make the decisions and they get good results.



The growers feel this technique is logical. Monitor the insects and spray when they are on the crop. If no insects, or very low levels are present than, don't spray. 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.