2014 CCE Summer Internships

CATEGORY ARCHIVES: DEVELOPMENT OF SURVEY AND MONITORING PROCEDURES FOR A NEW PEST IN ORCHARDS – BLACK STEM BORER

Looking forward in addressing the Black Stem Borer

Posted on **August 4, 2014** by **Hannah Rae Warren**

This week I will be presenting all about my work on the Black stem borer to the Board of supervisors heading the Cornell Cooperative Extension office of Wayne County. At the presentation I will be joined by Beth Claypoole, the Executive Director and Ag Issues leader at the Wayne office. After discussing my ideas with Ms. Claypoole we decided to structure the presentation by first introducing the problem of the black stem borer, then by discussing the physiological makeup of the beetle- how cultivate fungi under their wings, and then moving on to how we are monitoring beetle populations. I will be showing the board how we use the ethanol baited traps, and discussing the new directions we could take this project in, such as switching over to baited loglettes, and working on calculating economic impacts.

I have been giving some thought to how the results of this project could be utilized and how this project can be continued and expanded upon after I leave to go back to Cornell this fall. One idea is that it would be very helpful to work with growers, economists and fruit specialists to try to determine the economic threshold associated with Black Stem borer damage to trees. In doing this we could determine if in fact there is a point in which it becomes beneficial to treat against black stem borer (keeping in mind that there is *no labelled treatment for this pest*). Among other question to be asked, I think it is important to know how prevalent the black stem borer really is- including in non orchard areas, and why we are seeing so much damage in apple trees as of late . From Joelle Chille-Calle's presentation on black stem borer research she noted that this pest is fairly common in wooded areas as it lives in weak and dying trees. Does proximity to wooded areas play a role, and is there some environmental factor we can identify? Lastly I'm interested to know if and how changing weather patterns associated with global climate change could influence this pest.

Posted in **Development of Survey and monitoring procedures for a new pest in orchards – Black stem borer**

Honeycrisp quirks and the question of replanting trees

Posted on **July 30, 2014** by **Hannah Rae Warren**

While mapping out a block of honeycrisp apples today I couldn't help but wish I were eating a honeycrisp, not looking at dying honeycrisp trees. While searching for the site my faculty adviser Debbie Breth advised me to look for the plot with yellow splotchy leaves– a characteristic that makes this apple cultivar easy to spot. After doing a bit of research I learned a bit about this variety. The honeycrisp variety was developed at an experimental starion, much like our NYS Agricultural experiment station in Geneva, NY, in Minnesota University at Twin Cities. The explanation for the yellowing leaves, or zonal chlorosis, is the excessive carbohydrate accumulation that occurs as a result of the very sweet fruits it produces.

As I surveyed a very stressed block of honeycrisp apple trees I was keeping an eye out for any trees that looked particularly sickly or nearly dead, as well as for significantly smaller trees which could be assumed to be replants. As we consider the impacts of the black stem borer I also have to think about how replacing and removing dead trees impacts how the growers can care for their trees. Can the young trees tolerate the same treatments as the older trees? Should replant trees be as tightly spaced as original trees? And what types of risk, both economic and biological, are associated with removing and replacing trees that maybe affected? We may not have all the answers yet but these are important questions that people within the industry of fruit production must consider as consider whether or not they can afford restock their damaged blocks.

Posted in **Development of Survey and monitoring procedures for a new pest in orchards – Black stem borer**, **Uncategorized**

Walking the orchards

Posted on **July 9, 2014** by **Hannah Rae Warren**

This past week my Faculty advisor, Debbie Breth and I took time to walk the orchards. We came to a known BSB site which had been recording consistently low trap counts. However, the damage to the trees was startling. While inspecting the trees there were certain telltale signs of black stem borers that we kept an eye out for; flaking bark at the root stock, dark stains on the trunk, oozing, and small or dying foliage. Upon finding one of these signs we then inspected the tree and decided whether or not it was dead. As we went we tallied up the numbers of living trees and dead trees (including stumps where dead trees had been removed and replaced). The numbers were startling! Although we we only walked about 3 rows so far we were finding roughly 50% of the trees were dead or dying in some areas. This is interesting because the numbers of beetles being caught is relatively low. This tells us that the simple presence of black stem borers can be indicative of a much farther reaching problem. Furthermore, we may

look into changing the way we trap and detect, perhaps taking a note from Joelle Chille-Calles' book with the ethanol soaked loglette design.

Posted in **Development of Survey and monitoring procedures for a new pest in orchards – Black stem borer**

Seminar on Black Stem Borers at Cornell Univeristy

Posted on **July 1, 2014** by **Hannah Rae Warren**

This week I had the opportunity to attend a seminar offered by Joelle Chille-Calle, recent graduate of SUNY College of Environmental Science and Forestry. She presented on her research findings on the "New Biological and Cultural Control of the Non-Native Nursery Pest *Xylosandrus germanus".* This species is in fact our beetle of interest in our project and I find her presentation to be quite informative. I was joined by my faculty adviser Art Agnello as well as Liz Tee, a technician from the Ontario Fruit Program. We listened to Chille-Calle present on the basics on the pest problem, its extent, and her own personal research discoveries. Afterwards we hung around to ask her for any advice she might have about adapting her research methods for the kind of monitoring that we do on orchards in Wayne County.

We came away from the presentation with a couple of new ideas. In Chille-Calle's experiment in Mount Pleasant near Ithaca, NY she used small "loglettes" of beech wood soaked in Ethanol and Vodka to attract beetles. The idea was that growers might not have access to research-grade ethanol so she tested cheap vodka diluted to about 15% and found that it worked just as well and was far superior at catching beetles compared to standard ethanol baited traps, which is what we currently employ. I also learned that the sites low to the ground caught more beetles that higher ones–this may cause me to rethink our current trap set up which I will detail in my next blog post.

Furthermore, she discussed methods of biological control that are still in development. Essentially she attempted to introduce "good fungi" to fight bad fungi". Fungi plays an important role in the control of these beetles. They only consume one particular type of fungi, so the idea goes that if you extinguish the sole food source of the beetle you can decrease the overall beetle population. It was a really great experience to be able to hear from an expert in the field an I'm excited to incorporate her ideas and findings into our management practices at Cornell Cooperative Extension.

Posted in **Development of Survey and monitoring procedures for a new pest in orchards – Black stem borer**

What role does 'Fireblight' infection play in Ambrosia infestation in apple trees?

Posted on **June 8, 2014** by **Hannah Rae Warren**

— Damage characteristic of the ambrosia beetle found on a 4 year old apple tree. A small black hole can be see with wood dust and sap staining.

While visiting orchards I have been surprised by the increase in black stem borers that I am finding in my traps in certain areas. Interestingly, I at our trap sites on apple tree nurseries I am finding high numbers of beetles, particularly on the edge land that borders with brush or woods. In mature orchards I've encountered some beetles but in much lower numbers. However, I've seen plenty of dying trees, even at sites that are catching few beetles. Many of the trees that show evidence of beetle drill holes and also display signs of Fireblight. Fireblight is a very contagious bacteria that affects fruit trees and is typically treated with an antibiotic spray. We are interested in understanding what role the Fireblight plays in beetle infestation. Which comes first? Does Fireblight weaken the tree and attract beetles? A working theory is that perhaps the phenols given off by stressed trees, such as those experiencing drought or infection, serve to attract the ambrosia beetles. In the mean time, I have submitted wood samples to the New York Agricultural Experiment Station in Geneva to test for streptomycin-resistance in the Fireblight-stricken trees. In the coming weeks I will be working on setting traps at new sites, trying to positively identify the beetle types, and well as looking into the role of orchard irrigation in preventing beetle infestation.

Posted in **Development of Survey and monitoring procedures for a new pest in orchards – Black stem borer**

In Pursuit of the Black Stem Borer

Posted on **June 4, 2014** by **Hannah Rae Warren**

My name is Hannah Rae Warren and I am an International Agriculture and Rural Development major at Cornell in the class of 2016. This summer I'm excited to be interning with Cornell Cooperative Extension as we work to trap, identify and manage Ambrosia beetles that are killing large numbers of apple trees on orchards in Wayne County. My mentors for this project include Deborah Breth, an experienced plant pathologist and extension educator

working with the Lake Ontario Fruit program, and Arthur Agnello who is a professor of Entomology who studies tree fruit entomology at the New York State Agricultural Experiment Station in Geneva.

As an intern it is my job to build trap and set them up at locations of interest. I will be checking traps weekly, findings and taking tree samples to study in the lab. My “home base” will be the Cornell Cooperative Extension Station in Newark, but I will be spending much of my time in Wayne county meeting with growers and at the lab in Geneva.

My goal for this project is to specifically identify the species of Ambrosia beetle, understand how they are affecting trees, and learning more about treating and preventing tree damage. I am also interested in creating an economic assessment to understand the scope of the problem by recording how many trees have had to be pulled and replaced by apple growers and at what cost.

— So beautiful to see the orchards in bloom! Here is a trap set up on a farm in Sodus, NY.

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