Insectary Notes

MAY/JUNE 2007

INSECTARY
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Editor's Overview

Summer's here and the livin' is, well, busy. Traps for brown spruce longhorn beetle, spruce budworm, and gypsy moth are out, with the whitemarked tussock moth traps soon to come at the end of July.

A very current insect topic is the mystery of the Colony Collapse Disorder in honey bees. Eric Georgeson has written an article on the theories involved with this perplexing conundrum (pg 2).

In the Provincial Entomologist's column (pg 4), Gina has included some information on the critters that are buzzing or crawling across her desk (tent caterpillars, cankerworms, and millipedes, Oh my!)

And it will soon be time to start thinking about fruit flies. Just in case they get out of hand, directions for the fruit fly trap are on page 5.

To wrap up, page 6 has some project updates and a few "tongue in cheek" ways to cope with ants.

'Til next time,

Jacqui

Veni. Vidi. Visa: I Came. I Saw. I Shopped.

Insectary Notes - Electronic Copies

Just a reminder that the newsletter is available by email. Not only will you get your copy a few days earlier, you'll also be able to see the colour on our maps and images.

Email Jacqui Gordon at
gordonjm@gov.ns.ca
if you'd like to receive the newsletter by email.

Say What and Quotes . . .

I've developed a new philosophy . . . only dread one day at a time.- Charlie Brown

I might be in the basement. I'll go upstairs and check.- M. C. Escher

Nobody can get the truth out of me because even I don't know what it is. I keep myself in a constant state of utter confusion.- Colonel Flagg

"More fun than a barrel of monkeys." Has anyone ever stopped to think how cranky, if not downright vicious, a barrelful of monkeys would be, especially once released from the barrel? - Tom Shales

There are some situations from which one can only escape by acting like a devil or a lunatic. - George Orwell

Quidquid latine dictum sit, altum videtur (Anything said in Latin sounds profound). - Anon

May the forces of evil become confused on the way to your house. - George Carlin

The reason the golf pro tells you to keep your head down is so you can't see him laughing. - Phyllis Diller

A perfect summer day is when the sun is shining, the breeze is blowing, the birds are singing, and the lawn mower is broken. - James Dent

If my critics saw me walking over the Thames they would say it was because I couldn't swim. - Margaret Thatcher

Insect Focus

Eric Georgeson

Colony Collapse Disorder

There is a lot of truth in the old saying "you never miss the water until the well goes dry." Such is the present situation regarding the common honey bee. Except you can say, "You never miss the groceries until the honey bees disappear." There is a mysterious condition affecting honey bee colonies that is causing bees to disappear from their hives. It is now found in North and South America, Europe, and Asia. To make matters worse it has appeared very suddenly; just noted in the U.S. in 2006, and now worldwide. It is almost as if some unknown threshold has been crossed causing honey bees to disappear en mass. It's a regular bee Bermuda Triangle with no easy answers. And the name this mystery has been given is Colony Collapse Disorder or CCD.

Symptoms

The symptoms are as follows: a sudden loss of adult bees with no bodies left behind and uncapped brood cells. Any bees remaining in the colony (usually the queen and a few young workers) are loaded with multiple infections. Normally, once a hive is abandoned, other bees and hive pests will rush in to raid the stricken hive. With CCD hives, this is not the case until several days or even weeks have passed.

Damage

Colony Collapse Disorder became very apparent last year when U.S. beekeepers began to find empty hives. According to the Apiarist Inspectors of America, 24% of 384 beekeeping operations across the country lost more than half of their colonies from September 2006 to March 2007; some have lost 90% of their colonies. One beekeeper who had 3000 hives lost 70% of his hives which cost him more than $460,000 in lost honey production and pollination opportunities. So far this year worldwide losses of bee colonies to CCD have continued to increase.

Important Pollinators

The reason so many people are concerned about this problem is that modern agriculture depends heavily on bees brought in for crop pollination. For example, the pollination of almonds depends almost entirely on honeybees. But this is not the only crop: apples, cherries, strawberries, peas, beans, and blueberries rely partly or wholly on honey bees for pollination. Many large industrial farms depend almost exclusively on bees for pollination. The natural pollinators are not numerous enough to do the job due to the removal of the native habitat which they require for survival.

The Theories

According to Georgeson's Rule of Life, Number 72, "The less one knows about something the more theories that can be produced to explain it." CCD is the poster child for the above rule because no one yet knows what causes it. Some of the theories developed so far are as follows:

Theory 1: A new group of pesticides - the neonicotinoids

Although these pesticides seem to be safe for people, not only do they kill bees but in small sublethal amounts they can reduce the bees' ability to learn and to navigate. However, the French banned this group of pesticides in 1999 and their hives also have CCD so this theory is doubtful.

Theory 2: Osama ben Laden

This theory has come from a small group in Washington. Scientists working on the CCD problem feel that he just would not have the resources to make it happen.

Theory 3: Genetically engineered corn containing Btk (*Bacillus thuringienis* var. *kurstaki*)

The idea here is that the Btk in the corn pollen damages the bee's digestive system allowing pathogens and parasites to enter the bee's body. However, there have been many studies done proving that this does not happen to bees when fed pollen from transgenic crops.

Theory 4: New Nosema parasite

A new Nosema protozoan from Asia has been accidentally introduced into North America and Europe and is rapidly spreading from hive to hive.

Work is still under way on this one but so far there is no significant difference between levels of Nosema in normal and CCD hives.

Theory 5: New forms of Varroa mite

There is a new form of Varroa mite that is resistant to treatment. Work is still underway on this theory but so far there is nothing conclusive.

Theory 6: Cell phones disrupt bee navigation

This theory is based on studies which found bee hives placed under power lines tended to lose bees. Some work done with cell phone use near bee hives shows that the bees behaved in an abnormal manner. Work is still underway but does not seem to explain all the symptoms associated with CCD.

Theory 7: Bee immune system collapse

This is sometimes referred to as Bee AIDS. The honeybee's genome was sequenced in 2006 as part of the Varroan mite study. To many scientists' surprise it was found that the honey bee's genome has only half as many genes to detoxify poisons and to fight off infections as do other insects. This would explain the large number of pathogens found in those bees that are survivors in CCD hives. Work is still ongoing.

Theory 8: A number of factors working together

Not one thing but a number of factors interacting together to cause CCD.

Here is some good news. Dr. Dennis Van Engelsdorp conducted an experiment where 200 beehive boxes with new healthy bees from Australia were set up. Fifty of the hives were first irradiated to kill potential pathogens, fifty were fumigated with concentrated acetic acid, fifty were filled with honey frames that have been taken from hives before the collapse and the last fifty were hives that CCD occurred in and were now abandoned.

The analysis of this work is still underway but these are the results found this May after the hives over wintered. The bees in the untreated hives were not doing well at all. The bees on the reused honey comb were alive but not thriving. The hives treated with acetic acid were doing better but when the irradiated hives were opened the bees were doing very well. At first glance Dr. Van Engelsdosp feels that this implies there is something biological causing CCD. Nothing more can be said until the data is analyzed.

Urban legend quotes Albert Einstein as saying, "If the bee disappeared off the surface of the globe, that man would only have four years left to live." Whether or not Einstein had thoughts on bees, there is no doubt that there will be food shortages of certain crops. If the present rate of colonies losses remain the same, there will be no bees by 2035. This date according to some scientist is wildly optimistic and could be sooner if the situation gets worse. But then again CCD could disappear this year. There are reports that something very similar to this had happen in the 1920's and again the 1960's, then disappeared. But it was never as widespread as this outbreak. In the meantime a lot of effort is being put toward finding out what's causing CCD and how to stop it.

References

MAAREC - Mid-Atlantic Apiculture Research and Extension Consortium http://maarec.cas.psu.edu/ColonyCollapseDisorder.html

VanEngelsdorp D., Underwood R., Caron D., and Hayes Jr., J. 2007. An Estimate of Managed Colony Losses in the Winter of 2006-2007: A Report Commissioned by the Apiary Inspectors of America. American Bee Journal, 5/17/2007.

Insectary Notes ***May/June 2007***

Published by: Integrated Pest Management
NS Dept. of Natural Resources
PO Box 130 Shubenacadie
Nova Scotia, B0N 2H0

Insectary Notes is published 6 times per year for employees of the Dept. of Natural Resources, those interested in forestry and forest insects, and entomologists. Subscriptions are free.
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Provincial Entomologist's Overview
What's the Buzz?

Summer must be on its way because things are really starting to heat up at the Insectary's pest ID desk. Topping the list of "favorite" pests are: ticks, millipedes, fall cankerworm, and eastern tent caterpillar.

Since 2004, the reports of blacklegged ticks testing positive for *Borrelia burgdorferi*, the bacterium responsible for Lyme disease, has been on the rise in Nova Scotia. When in areas where ticks are known to be present, cover as much of your skin as possible and wear long pants and closed toed shoes. Tuck your shirt into your pants and your pant legs into your socks. Check yourself for ticks, removing any imbedded ticks with forceps, grasping them as close to the skin as possible. Pull them out slowly and straight without twisting. Disinfect the site with soap and water, rubbing alcohol, or hydrogen peroxide to avoid other infections. Record the date and location of the tick and contact your doctor if rash or flu like symptoms appear.

Lots of millipedes have been reported creeping across foundations and driveways. They have long, approximately 2.5 cm, dark, cylindrical bodies with two pairs of legs per body segment. Fortunately, they feed on decaying plant material and don't bite or damage structures. To avoid these nocturnal visitors, remove piles of leaves, mulch etc. from around your home, seal any cracks around basement windows, install weather stripping around doors and properly ventilate basements and other damp areas to eliminate any excess moisture.

Populations of eastern tent caterpillars and fall cankerworm, both native to North America, have also been reported. Eastern tent caterpillars feed on a variety of trees including apple, birch, poplar, willow, and wild cherry. Caterpillars feed during the day, returning to silken tents, built in branch crotches and forks, at night. Mature caterpillars are approximately 6 cm long, hairy and black. They have white stripes down their backs, and brown and yellow lines and a row of blue spots along their sides. Check branches in the fall and early spring check branches for egg masses, held together by a dark foam-like substance; later in the spring watch for the presence of tents. To help keep populations low, egg masses and tents can be pruned out and destroyed.

Fall cankerworm feeds on the leaves of various hardwoods including red and sugar maples, red oak, white elm, basswood, white ash and trembling aspen. It's so named because adult moths are active in late fall while the larvae feed in the spring. Mature larvae are approximately 2.5 cm long, varying between light green and dark brownish-green. Adult female moths are wingless, therefore they must climb trees to lay their tiny vase-shaped eggs. These eggs are laid as a single layer on the bark of smaller twigs and branches. Females can be captured before they lay their eggs by placing a band of sticky material around the trunk in late fall.

'Til Next Time,

Gina

Provincial Entomologist

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Most Unwanted List

Fall cankerworm
Tent caterpillars
Mosquitoes
Black flies
Biting flies in general
Gypsy moth larvae
Pale winged grey
Whitemarked tussock moth larvae
Ants

Dishonourable Mention
(Not insects but still unwanted)
Ticks
Slugs
Millipedes

Bits and Pieces

Fruit Flies

Jacqui Gordon

The annual plague of fruit flies will soon strike. It seems that every year I learn of a new place for fruit flies to live. Two years ago, one of our readers called me about a fruit fly problem. We went over the usual suspects guilty of harbouring fruit flies . . .

- food sources: over ripe fruit or vegetables (don't forget about the lonely potatoes in the back of the pantry), spilled juice from sweet pickles, a stray dirty dish tucked under a teenager's bed
- a composter too close to the doorway
- holes in window or door screens
- leftover food scraps caught in the kitchen sink drain

But she had done all the right stuff. Any suspicious fruit or vegetables were refrigerated or disposed properly. The composter was moved away from the house. She lived in an area with a healthy population of black flies so the screens were in good working order. She had even put a bit of bleach down the kitchen sink to take care of any thing in the drain. I was stumped. I advised the use of the fruit fly trap and hoped for the best. I stressed the fact that control of a fruit fly population depends on removing the food source.

A couple of weeks later I received a call. She had found the source of the fruit flies. Pop bottles and cans, stored in the basement in a clear bag for recycling. The small amount of pop left in the cans and bottles was enough to keep the fruit flies going. Mystery solved! Conveniently the previous night had been cold so the bag of offending cans and bottles spent the night in the shed and that ended the fruit fly problem.

Just in case you still need it, here are the directions for making the trap.

CAUTION: IF THE TRAP IS NOT EMPTIED ON A DAILY BASIS, IT WILL BECOME A BREEDING GROUND FOR EVEN MORE FRUIT FLIES . . .

Fruit Fly Trap

What you'll need . . .

- an empty plastic yogurt or ice cream container (500 ml or 1 litre size)
- bait (over ripe fruit)
- an elastic band
- plastic food wrap
- a sharp knife

To make the trap . . .

Place the bait in the bottom of the plastic container. Cut a piece of plastic wrap large enough to cover the top. Place the wrap over the top and secure with the elastic. (The plastic wrap should be tight and smooth across the top.) Using the knife, cut a small slit (about 1/4 of an inch) in the centre of the plastic wrap. Set the trap where you are finding the fruit flies.

To empty the trap (should be done daily!): Place the covered container in the freezer overnight. Throw the contents into the compost.

Biodiversity in the CB Highlands

Jeff Ogden

Plans are again underway to head to the highlands of Cape Breton to continue my look at the insect biodiversity of this remote region of the province. In 2007, I will be accompanied by researchers and students from Cape Breton University with hopes to drum up the interest of future graduate students (it is a big place and there are more than enough bugs to go around!!) Prior to this "mini-project," initiated in 2005, very little entomology work other than forest pest surveillance, has ever been done in the Highlands region. The area is not only home to the only true boreal forest within Nova Scotia, but also contains numerous unique barrens, bogs, spring-fed streams and lakes and high elevation meadows. Over the next several years, plans are to examine each habitat thoroughly to gain a better understanding of the insect fauna within this rich and diverse portion of our province.

Ant Wars

Some ”less than practical . . . highly funny . . . doncha just wish . . . just once” ways to deal with ants. Gotta love those creative minds on the internet!

Method A: AARDVARKS

Application: Sprinkle Aardvarks liberally around ant nests and known ant hangouts (seedy ant-bars, and the like).
Pros: 100% Natural, little supervision required.
Cons: Once having consumed their fill of ants aardvarks tend to lose motivation. Should they gain control of the TV remote they will waste entire afternoons idly lounging on your furniture, flicking between game shows and forgetting to close the fridge door when they've raided it for yet another six-pack.

Method B: LARGE BOOTS

Application: Obtain a large pair of boots (hobnailed preferably), obtain a friend and arm them with the boots. Apply boots vigorously to the ants.
Pros: Cheap, 100% natural, good course of exercise for boot operator.
Cons: Requires continual application, this necessitates the instilling of a "War Against Ants" attitude in your boot wielding friend. Show them videos of "Them" and "The Hellstrom Chronicles.”

Method C: NAPALM

Application: Low level saturation bombing runs by F-111's or similar fighter-bomber military aircraft.
Pros: Immense emotional satisfaction, guaranteed ant genocide, visually spectacular.
Cons: Low-level saturation bombing runs tend to lower local property values. Misses can instil ill-feeling in your neighbours should you incinerate schools or houses.

Method D: TECHNO

Application: Arrange Internet access for the ants, ensure that they subscribe to Alt.Ant and Soc.Insect. Infiltrate these newsgroups and make frequent posts along the lines of: "My pheromone operating system is better than yours,” "Evil drug companies are withholding antennae rot cures" and "Green Cards for Worker Ants Spam" - encourage flamewars to erupt. After a few days ant society will collapse in a sea of internecine warfare, ant neuroses and mass hysteria.
Pros: Emotional satisfaction of toying with their little minds.
Cons: Expense and difficulty of obtaining thousands of teeny-tiny-terminals.

Project Updates

Jack Pine Budworm (JPB)

Mike LeBlanc

The 2007 field season began last week with our first trip around Lake Rossignol picking up Jack Pine Budworm branches to determine at what stage insect development was. We microscoped more than 700 shoots and found only 24 larvae. The larva we found were starting to spin their silk feeding chambers so they are just starting to emerge from their overwintering sites and are heading for the new foliage.

Pale Winged Grey (PWG)

Mike LeBlanc

We also did several Pale Winged Grey beatings south of Lake Rossignol where we knew there was a new population last year, and only found a few larvae. June 1 is the earliest I have ever collected any larvae since the outbreak began so they have just begun to hatch.

Kids in the Forest

Jacqui Gordon

In May, Keith Moore and I attended Kids in the Forest field days in Middle Sackville and Whycocomagh. Approximately 500 elementary school students attended these events and had a great day exploring and learning. Hats off to those who put together a well-organized and fun day.

Whitemarked Tussock Moth

Jacqui Gordon

Reports have come in from the Eastern Region that the whitemarked tussock moth eggs have begun to hatch. Normally the hatch is spread out over a couple of weeks but this year reports indicate little variation in hatching time. Scott MacEwan (Extension Specialist Christmas Trees, MacLellan’s Brook) observed the larvae feeding on the egg masses in the first week of July.

This could be a busy year for the WMTM. Stay tuned for further updates.