Insectary Notes

JANUARY/FEBRUARY 2007

INSECTARY
N.S. Dept. of Natural Resources
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Editor's Overview

Well, the cold has finally come to us. Although a little late in arriving, the temperatures have dipped to a decidedly un-balmy level. Keith and Mike have been keeping track of the highs and lows using the Dept. of Transportation and Public Works weather stations. Check out the table on page 7 and see where we stand compared to other years. Also, it's a good time to start thinking about checking your Christmas trees for balsam woolly adelgid. The procedure is on page 8.

Gina attended the Canadian Forest Pest Management Forum in December. She has put together a summary of the status of forest pests across the country. You'll find it on pages 5 & 6. Gina also wrote an article on the mystery of how insects spend the winter months. Brrr-urrow to pg. 3.

And from our roving reporter, Eric has contributed an article on dust mites (pg. 2) and an update from the world of Antland (pg. 3).

See you in the Spring!
'Til next time,

Jacqui

Caution: An incorrigible punster -- don't incorrige.

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.

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

Say What and Quotes . . .

He looked as inconspicuous as a tarantula on a slice of angel food cake. - Raymond Chandler

More from the . . .
"*Church Bulletin Misprints and Typos File*"

The Fasting & Prayer Conference includes meals.

The sermon this morning: "Jesus Walks on the Water."
The sermon tonight: "Searching for Jesus."

Ladies, don't forget the rummage sale. It's a chance to get rid of those things not worth keeping around the house. Bring your husbands.

Remember in prayer the many who are sick of our community.

Miss Charlene Mason sang "I will not pass this way again," giving obvious pleasure to the congregation.

Please place your donation in the envelope along with the deceased person you want remembered.

The church will host an evening of fine dining, super entertainment and gracious hostility.

Potluck supper Sunday at 5:00 P.M. - prayer and medication to follow.

Pest Focus

Dust Mites - It's Not All Dust

Eric Georgeson

Why They Matter . . .

There are times when I think that we are nothing more than a food source for insects, ticks, and mites. And these creatures have no doubt that we are just that. One of the smallest is the dust mite that doesn't even feed directly on us but instead consumes what falls off us . . . in other words, skin flakes. Normally this wouldn't matter except that a recent survey done by the American College of Allergy, Asthma, and Immunology (ACAAI) found that 90% of the people with allergic asthma and 10% of the general population are sensitive to dust mites. This puts dust mites at the top of the list for causing allergies.

The first person to see the lowly dust mite was Antony van Leeuwenhoek (1632-1723), the inventor of the microscope in 1694. They are small and cannot be seen by the naked eye, because they are only 420 micrometers or 1/100 of an inch long. They are rather globular in shape, have eight hairy legs, and are creamy white in colour with no eyes or antennae, just a mouthpart group at one end which is referred to as "the head."

How and What They Eat . . .

They live on dead hair cells and skin scales called dander. On average, a person sheds 1.5 grams of skin cells per day (approximately 0.3-0.45 kg per year . . . no wonder CSI is always looking for skin cells!) This provides a lot of food for dust mites. However, the mites have a problem eating these skin flakes. They have no stomach! They have only a rudimentary alimentary system which means that most of their food digestion must occur outside their body. To overcome this, they secrete enzymes over the skin particle along with decomposing fungus spores which will over time, predigest their food. The dust mite will eat the same material several times, only partially digesting it each time. Between feedings, the particles are left to break down more. It is only when the particles are fully digested does the mite leave it alone. At this point it is officially called fecal matter. During the life span of a female mite, there would be 2000 fecal particles left behind and about 10,000 partially digested particles . . . all of which are loaded with enzymes and fungus spores. It is the enzyme that can cause an allergic reaction in some people. To make it worse, beds are a perfect habitat for dust mites.

A typical used mattress may contain up to 10 million mites. The reason? Mites prefer warm moist surroundings like what is found on the inside of a mattress when someone is sleeping on it. They are very common and it is estimated, based on European studies that they can be found in most if not all homes. The mites really thrive in modern fully carpeted, double-glassed, draft-proof homes, and are content at 25°C and 75% relative humidity. Maybe living in an old ark-like, drafty house is not such a bad thing after all! Although it has been long known that dust mite droppings are linked to asthma and eczema, no one was really sure how they caused eczema until recently. A research team in Japan found that the enzyme that the mites use to digest food destroys the protective function of the skin. This results in rapid water loss from the area affected, drying the skin. Drier skin causes more dead skin cells to fall off and therefore more food. This leads to more mites and more patches of dry skin and so on. In short, it is a feedback loop to the advantage of the dust mites. This research paper will soon be published in the "Journal of Investigative Dermatology."

For most people, snuggling down at night with the mites is no big deal, but for those that have reactions to their cast skins or enzyme loaded waste products it is more of a problem. It is important to control their populations.

There are two primary things to remember. First you cannot get rid of all of the dust mites in your house and second, there are no pesticides registered that can be used. There is no silver bullet.

The things that can be done are as follows:

- Regular vacuum cleaning of the mattress every two weeks.
- Regular damp dusting of surfaces.
- Replace carpets with vinyl or wood flooring.
- Cover mattresses and pillows with material that the mites cannot get through.
- Daytime internment of teddy bears and other stuffed toys in freezer.

This will help but by how much is very variable, depending on the household.

Sometimes this is just too much information of what goes on while we sleep. It is interesting to note that more than 80% of all those little dust specks spinning in a shaft of light are really small skin particles. It gave me a whole new meaning of the expression "blowing in the wind."

Provincial Entomologist's Overview . . . . . What's The Buzz?

It's Winter, Where have all the Insects Gone?

At its peak, when it's bitterly cold and dark it's often hard to believe that anything could survive in such a harsh winter landscape but as always, insects overcome. Insects are cold blooded, meaning their temperature is dependent on the temperature of their surroundings. So, to prepare for winter's worst, insects have developed a variety of techniques for survival.

Overwintering as Eggs

Many insects, such as the praying mantis and gypsy moth, spend the winter as eggs. Insect eggs, thanks to their thick, watertight shells, are perfectly suited for withstanding the hardships of winter. They may also be covered with an extra layer of insulation in the form of hairs, silk, or frothy materials provided by the female as she lays the eggs.

Hibernation - Sleeping the Winter Away

Many insects go dormant during the winter, entering a resting phase known as diapause. As day-length shortens, insects are induced to prepare for diapause. Some add extra layers of fat, while others replace the water in their bodies with a naturally produced glycerol. This glycerol acts as a type of antifreeze, decreasing the formation of ice crystals in the insect's cells, which may cause them to burst.

Insects may hibernate as immatures (nymphs, larvae, or pupae) or adults. Overwintering larvae find protection under the bark of trees, leaf litter or by burrowing into the ground. Some, like the golden rod fly, survive by creating galls. In the spring or early summer, the adult golden rod fly lays an egg in the stem of a goldenrod. Chemicals injected with the egg or produced by the larvae cause the plant's stem to swell producing a thick, tumour-like growth. This gall provides not only shelter from the harsh winter weather, its soft inner tissue is also a food source for the larva growing inside. Insects that hibernate as pupae are generally covered with a thick, insulating silk covering referred to as a cocoon.

For overwintering adults, finding a sheltered location, such as in tree holes or under logs and rocks is a must. Ladybird beetles, cluster flies, root weevils among others seek shelter in the walls, attics, and under eaves of our homes and other structures. Honeybees spend the winter in their hive, huddling together when temperatures drop and heating the hive by vibrating their wings.

Migration

Like many snowbirds, some insects migrate south for the winter; the most famous fo these being the monarch butterfly. In winter adult monarchs fly south to Central Mexico or southern California and their offspring make the return flight north the following spring.

Tough it Out

A few insects are active all year round, or only during the winter months. The immature stages of various aquatic insects, e.g., blackflies, mosquitoes, and dragonflies, remain active throughout the year below the ice of ponds, lakes, and streams. They feed and grow all winter with adults emerging in early spring. Winter stoneflies and a small, jumping insects, known as the snow flea are active only during the winter and early spring months.

Until next time,

Gina

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Bits and Pieces

Antland Report

Eric Georgeson

They are older than we first thought. Work done by a researcher at Harvard's Museum of Comparative Zoology has determined that ants first organized their nest about 168 million years ago. Once flowering plants came into their own about 100 million years ago, they really started to diversify into different ants groups. With this head start, no wonder they are the dominant feature of nearly all of earth's ecosystems. With their millions of years of experience collecting food; how could we imagine we could have a picnic without them? What were we thinking?

And . . . The Jumping Jack Ant

The new Fastest Jaws on the Planet Award goes to the Trap Jaw ant! This small ant is a native of Central and South America. Work done by researcher Sheila Patek at the University of California, using high speed cameras, has found that this ant can clamp its mandibles shut at around 233 km/hr. The time it takes for it to close its jaws is 0.12 milliseconds which is about 2300 times faster than the blink of an eye. That may also be faster that the Roadrunner on Bugs Bunny! When this ant is in a losing battle, it will snap its jaws against the ground with such force that it will flip itself into the air and away from danger. The ants are only seven millimeters long but the flip in the air can go as high as eight centimeters.

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Vinegar Valentines

Jacqui Gordon

Tired of those over-sweet valentines? "Vinegar valentines" have been around since the mid-1800's. They are greeting cards, or, rather, insult cards, that come in the form of an insult, decorated with a caricature and, below that, an insulting poem (Wikipedia).

Maybe I'll use these next year . . .

Every time I look at you I get a fierce desire to be lonesome. - Oscar Levant

His mother should have thrown him away and kept the stork. - Mae West

I didn't attend the funeral, but I sent a nice letter saying I approved of it. - Mark Twain

I have never killed a man, but I have read many obituaries with great pleasure. - Clarence Darrow

I like long walks, especially when they are taken by people who annoy me. - Fred Allen

I regard you with an indifference bordering on aversion. - Robert Louis Stevenson

I'll bet your father spent the first year of your life throwing rocks at the stork. - Irving Brecher (Marx Bros. "At the Circus")

He is simply a shiver looking for a spine to run up. - Paul Keating

You're a parasite for sore eyes. - Gregory Ratoff

Some cause happiness wherever they go; others whenever they go. - Oscar Wilde

You look into his eyes, and you get the feeling someone else is driving. - David Letterman

While he was not dumber than an ox he was not any smarter either. - James Thurber

Update From the Canadian Forest Pest Management Forum

Gina Penny

In December, I attended the Canadian Forestry Pest Management Forum in Ottawa. Each province represented gave a report on forest pest conditions from their region. The following table is a snapshot of the conditions across the country.
To save space, “population(s)” is abbreviated to “pop(s).”

Table 1. CANADIAN FOREST PEST MANAGEMENT FORUM SUMMARY, OTTAWA, ONTARIO, 5 - 7 DECEMBER 2006.

Prov. / Insect	BC	AB	SK	MB	ON	QE	NB	NS	NFLD
Spruce Budworm	down from 2005	increasing	sprayed Btk in 2006	NW region down, E & SW regions up	low levels	on the rise, 50 498 ha	pops. at low levels but increasing	moth pop. increasing but still at low levels	very low numbers, slight increase since 2005
Gypsy Moth	no established pops.		low pops.		expanding 10 309 ha in 2006	light on red oak	expecting pop. increase in 2007	established pop. slowly spreading	
Jack Pine Budworm			small pops.	no defoliation, moth pops increasing	could be large outbreak in 2007	pop. in decline	low levels	low to moderate defoliation	
Forest Tent Caterpillar		increasing, outbreak in 2007	no major defoliation in 2006		persistent in some areas		outbreak expected, monitoring		
Hemlock Looper						egg forecasts light	monitoring	monitoring, wait & see	small pockets of infestation
Yellowheaded Spruce Sawfly		low pops.		pops. up					small pop.
Balsam Woolly Adelgid							prevalent in south	increased damage & activity	still active, chronic
Large Aspen Tortrix		pop. collapsed in 2006			present	expanding			

Prov. / Insect	BC	AB	SK	MB	ON	QE	NB	NS	NFLD
Mountain Pine Beetle	9.22 mill. ha, up from 2005	increasing, outbreak 2007							
Whitemarked Tussock Moth							wait and see	increased damage & activity	
Fall Webworm					299ha in 2006	outbreak on cherry, elms			
Spruce Beetle	way up from 2005							damage & activity up	
Blackheaded Budworm								no defoliation in 2006	
Pale Winged Grey								expanding	
White Pine Weevil				extensive damage					
Larch Beetle			increasing	chlorotic symptoms					
Balsam Gall Midge							pops. on the increase		prevalent on fir
Balsam Fir Sawfly								no activity	ongoing & expanding

Other Noteworthy Pests:

British Columbia
- Douglas Fir Beetle - 57 658ha (way up since 2005)
- Western Balsam Bark Beetle - 1.6 million ha (up since 2005)
- Western Spruce Budworm - increased from 2005
- Western Hemlock Looper - increased from 2005

Alberta
- Western Spruce Beetle - low populations

Ontario
- Pine False Webworm - 286ha defoliated in 2006
- Larch Casebearer - 991ha in SE Ontario
- Hickory Bark Beetle - 344 982ha damage/mortality
- Whitespotted Sawyer - 1 322ha mortality in 2006
- European Wood Wasp (*Sirex*) - detected

Project Updates

Balsam Woolly Adelgid

Keith Moore

I wanted to get the jump on things so I started my submission to the newsletter back in early January. I wrote about the El Niño that was going to happen this winter and expressed concern over how warm this winter was going to be and the effects it would have on the Balsam woolly adelgid numbers. Well, here we are in late February and it's been double digit frigid for the last six weeks. Not an extreme cold, but a really good steady cold enough kinda winter. I'm loving it!!!!. As I said to my neighbours before White Juan, bring it on! You know it's hard to shovel 12 feet of snow. Have a look at some of the temperature tables. Keep in mind that a -25°C will take 25% of overwintering adelgid nymphs and a -20°C or high teens will keep the population the same or lower. Enjoy our beautiful winter weather!!!!

Table 2. NS DEPT. OF TRANSPORTATION AND PUBLIC WORKS WEATHER SATION DATA. COLDEST RECORDED TEMPERATURES (°C) FOR WINTER 2003/04 TO WINTER 2006/07.

Location	Winter* 2003/04	Winter* 2004/05	Winter* 2005/06	Winter* 2006/07***
North Sydney	-19.3	-17.6	-17.7	-19.2
Canso Causeway	n/a**	-17.2	-16.8	-18.2
Trafalgar	n/a**	n/a**	-14.8	-26.0
Upper Mt. Thom	-28.2	-23.3	-21.1	-24.0
Marshy Hope	-25.7	-25	-23.6	-24.2
Springhill	-38.8	-34.6	-24.7	-30.5
Yarmouth	-20.1	-18	-14.3	-15.5
Granite Village	n/a**	n/a**	n/a**	-19.8
Trunk 12	-25.3	-25.4	-20.3	-23.2
Kingston	-23.9	-23.7	-19.6	-20.5
Mt. Uniacke	-27.2	-25.1	-19.6	-22.3
Blackville (N.B.)	n/a**	n/a**	n/a**	-31.1

* Winter = mid-December to mid-March.
** n/a indicates that data was not available from this tower because it was a newly established tower.
*** The readings for Winter 2006/07 are up to and including 14 February 2007.

Balsam Woolly Adelgid Population Presence in True Fir Trees

Mike LeBlanc and Keith Moore

This is a good project to start in March to give you an idea of what you will be dealing within the growing season. This procedure will not tell you how many insects you have but will indicate if they are present.

1). Randomly select three trees per location, and collect one branch per tree, about 12 - 18 inches long (30 - 45cm), from the middle of the tree.

(Choose branches that are only slightly gouted!)

2). Stand the branches in a bucket containing 3 - 4 inches (7 - 10cm) of water.

3). Place in a warm, heated area; preferably in front of a sunny window.

4). Starting approximately five days later, begin to look for white, woolly masses at the bases of buds, under bark scales, or at the branch nodes. These woolly masses grow to about 1/16 in (2 mm) in size; a hand lens or magnifying glass will aid this procedure.

This will give you a confirmation as to whether or not a population of adelgids exists on your trees. If you observe some woolly masses on the branches, watch for damage symptoms on all the trees in your lot. This will indicate to you that damage control may have to be implemented such as sanitation (tree removal), or if populations are high enough, spraying may be considered.

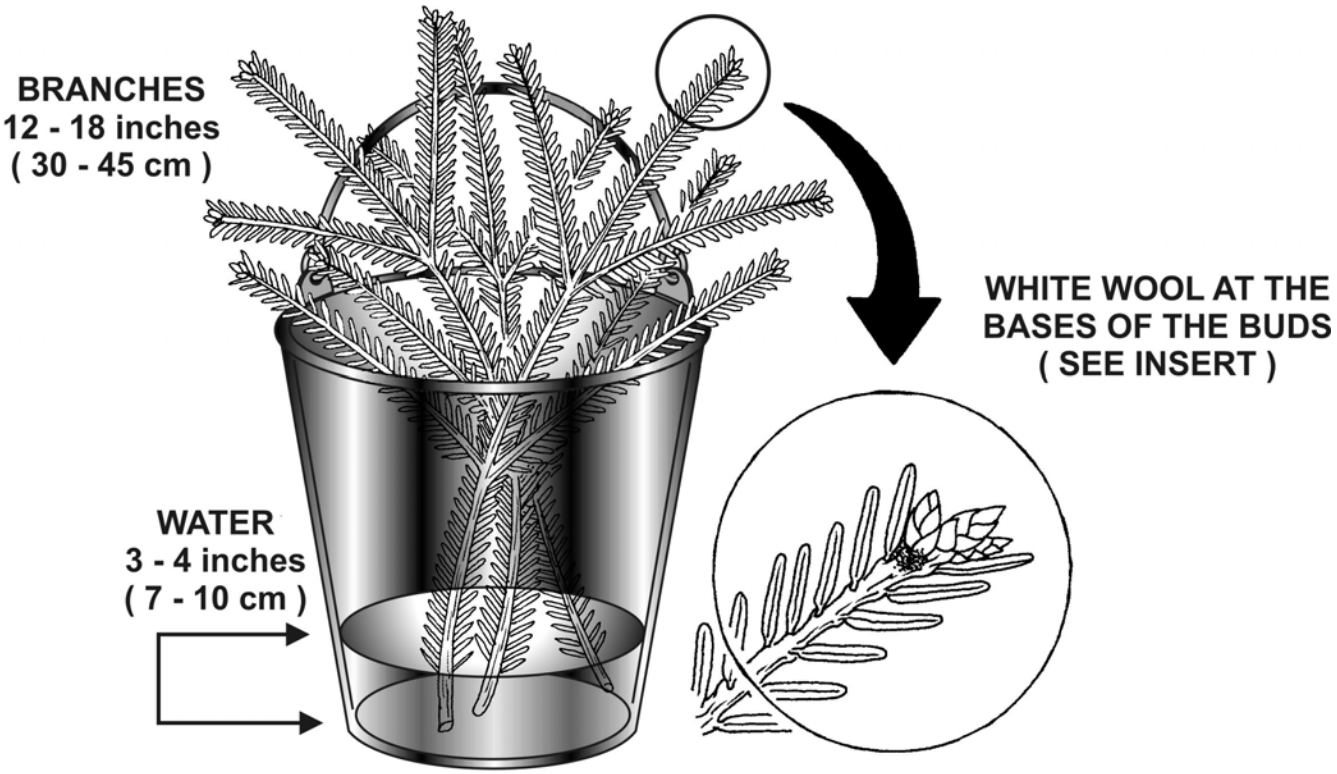

Figure. 1. *Set-up for determining the presence of the balsam woolly adelgid. Note the enlargement of the white wool below the bud.*