From the Editor

Just when we think things can't get any busier, April, May, and June arrive! It's time for meetings, courses, and trap placement/checking.

You may have noticed that the larch has been looking especially bad this spring. Find out about the little critter causing some widespread damage in the Insect Focus.

Ever wondered how insects care for their young? So was our Provincial Forest Entomologist, just before she heads off on maternity leave.

The balsam woolly adelgid project has expanded. See where it's going in the Project Update section.

'Til next time,

Jacqui

Editing . . . a Rewording Activity

Say What and Quotes

There's nothing worse than that moment during an argument when you realize you're wrong.- Unknown

Patient is something you admire in the driver behind you, but not in one ahead.- Bill McGlashen

The quickest way to double your money is to fold it over and put it back in your pocket.- Will Rogers

I dream of a better tomorrow, where chickens can cross the road and not be questioned about their motives.- Unknown

If I agreed with you we'd both be wrong.- Unknown

The human brain is a wonderful thing. It starts working the moment you are born, and never stops until you stand up to speak in public.- George Jessel

All men are equal before fish.- Herbert Hoover

I have tried to know absolutely nothing about a great many things, and I have succeeded fairly well.- Robert Benchley
Insect Focus

Larch Casebearer - *Coleophora laricella*

Jacqui Gordon, Jeff Ogden

Some of you may have noticed the larch looking a bit, well, bad. As the rest of the trees green up, the larch is standing out by being more reddish-grey than green. The culprit behind this is the larch casebearer (*Coleophora laricella*).

**Introduction**

The larch casebearer is a species of moth that was introduced to Canada in the early 1900's. It now occurs throughout eastern Canada and the Northeastern and Western US.

The feeding of the larvae is the stage that causes the damage to the foliage.

**Hosts**

The larvae feed on many species of larch, including:
- Eastern larch (*Larix laricina*)
- common or European larch (*L. decidua*)
- Dahurian larch (*L. dahurica*)
- Japanese larch (*L. kaempferi*)
- Western larch (*L. occidentalis*).

The larch casebearer can be detected in the spring from the light brown colour of the foliage and the presence of tiny, cigar-shaped cases on needles. After overwintering in needle cases attached to twigs near buds, the larvae feed by mining into needles from within their cases. At the end of their development, they attach their cases to a twig or a needle and change into pupae. In the summer, small silver gray moths can be seen flying around the crowns of larches. In autumn after the needles have been shed, the presence of cases can be easily detected on the twigs near buds (Smith and Attwater, 2003).

Since most of the damage occurs when the new foliage is developing, the tree may be able to produce more foliage to replace what was lost. Mortality is uncommon but several seasons of attack will result in severe reductions in growth.

**References**

Smith, B. and Attwater, W.A. 2003. The Larch Casebearer Factsheet. Pest Diagnostic Clinic, University of Guelph. [http://www.uoguelph.ca/pdc/Factsheets/Insect/LarchCasebearer.htm](http://www.uoguelph.ca/pdc/Factsheets/Insect/LarchCasebearer.htm)

Bits and Pieces

Pest Detection Officer System
Jeff Ogden

This month I have decided to focus on a positive rather than a negative. Don’t get me wrong I can think of plenty of topics to complain about . . . dogs off leash on plover beaches; the guy that cut me off and made me miss my light this morning and the loooong train going through Truro . . . what's up with that anyway??

I want to write about a vital part of Forest Health that some people may not be aware of: the role of our Pest Detection Officer (PDO) system. PDO’s are found throughout the province in 21 of our district offices. In most cases they are our eyes and ears in the districts and along with frontline staff, deal with concerns the public may have regarding various insect pests and tree diseases. They forward samples for identification, do site visits, and participate in numerous Forest Health projects. Without their valuable assistance many projects would be incomplete due to the size of the province and the available time and staff here at Forest Health.

We have just recently completed two out of four of our new PDO courses in Western and Central regions and in April we had another successful PDO meeting in Truro. Both the courses and the annual meeting were well attended and seemingly well received. It was great to see that no matter how “experienced” the participants were . . . not just a euphemism for old . . . they had the patience to sit through even the routine portions, often offering assistance to the more novice within the group making the job of facilitating the workshop even easier for Jacqui and myself. I hope the remaining two courses are as successful and as informative to the participants.

So hats off to our PDO's and the hard work they do for us, often underrated, sometimes taken for granted, in the cases of the “experienced” few, but never forgotten. They are an intricate part of the service Forest Health provides.

From the ID Desk
Jeff Ogden

I have received numerous calls over the past weeks regarding so-called diseased larch in central Nova Scotia. This problem is actually not a disease, but rather a common pest insect. The larch are being heavily defoliated by the larch casebearer, Coleophora laricella (Coleophoridae). If you missed it, go back to page 2 and find more details on this insect species. So far this year I have reports of heavy damage in central portions of the province, the Musquodoboit valley region, and parts of Shelburne and Lunenburg Counties.

And we have received reports from Kentville that the gypsy moth larvae have hatched and are feeding. So far, the population seems to be low . . . but our trap catches from that area have been creeping up over the past couple of years. Keep an eye out for these growing larvae.

The tents you’re seeing now in the hardwoods are made by the eastern tent caterpillar. As in past years, the damage to the trees will be minimal. The best way to control this species is the removal of the nest . . . not necessarily the branch. If you rip open the nest, predators can get in and have a feast.

Fig. 2  Gypsy moth egg mass and newly hatched larvae.
Child Care among the Insects

As I put together this article I’m preparing to go out on maternity leave. To that end I thought I’d use this space to discuss some of the various insects that use paternal care and examine the different ways that insects can care for their young.

Maternal Care - Single Mothers

Maternal care and offspring protection have been well documented in insects. Web-spinners have specialized silk glands on their enlarged front feet, and are the only insects known to produce silk in this way. They spin long, tube-like nests, known as galleries, in sheltered locations such as under rocks or bark, in soil or plant litter and in old wood. It’s in these galleries where the parental care takes place. Males and females mate in a female’s gallery, the male leaves shortly thereafter and the female then lays her eggs. When the eggs hatch the nymphs live within the gallery with their mother under her care. When they reach adulthood, just like many human children, they may leave the nest to find a new place to live or continue to live in their mother’s gallery, expanding it to encompass more individuals.

Female lace bugs of the species Gargaphia guard their eggs and nymphs from predators such as damsel bugs. The damsel bug has a sharp, hard beak and if given the chance would happily devour each and every nymph. The delicate lace bug however has no such weaponry and tries to divert the damsel bug by fanning her wings and climbing on its back. Meanwhile the nymphs rush to seek shelter and hide in the young, curled leaves. If the mother can get away, she follows them and guards the stem of the leaf. All too often, though, she dies in the attack, her sacrifice giving the nymphs time to escape with their lives.

To deter predators, the female European shield bug (Elasmucha grisea), guards her eggs by standing over them until they hatch into small larvae; later stage larvae are abandoned. She challenges predators by standing fast over her eggs and tilting her body towards them.

Paternal Care - Single Dads

Paternal care, or care only by the father, is a very unusual behaviour among insects. It’s found in very few insects, including the golden egg bug (Phyllomorpha laciniata) and the giant water bugs.

Usually the golden egg bug lays its eggs on vegetation near the ground. Unfortunately, the majority of these unprotected eggs ended up being eaten by ants. To reduce the amount of eggs lost to ant predators the females of this species have started to deposit their eggs on the back of the males protecting them until they hatch. The males don’t like having ants on them, so in turn they are inclined to keep the ants away from the eggs they are carrying. The males will carry the eggs around with them until they hatch and the nymphs are left to fend for themselves.
Female *Lethocerus*, a primitive group of giant water bugs, lay their eggs on a stick above the water. The male repeatedly dives into the water climbing out to drip onto the eggs keeping them moist; he also drives off predators. But male *Belostoma* giant water bugs instead carry the eggs, which the females glue onto their backs. These males must keep floating to the water's surface exposing the eggs to air. They move their hind legs back and forth or hold on to twigs doing push-ups for hours to keep aerated water flowing over the eggs.

**Two Parent Care – The Nuclear Family**

Among insects, cooperation between the sexes in caring for their offspring is very unusual. The insects with the reputation for the greatest amount of shared responsibility in child care are burying beetles (genus *Nicrophorus*). Male and female burying beetles (*Nicrophorus orbicollis*) pair off at a carcass, and after defending it from others, bury it. Underground, the carcass is rolled into a ball, fur or feathers are removed, and it is covered with anal and oral secretions. Eggs are laid in the soil nearby, and hatch into larvae, which are fed regurgitant by both parents. Although larvae may be able to feed themselves relatively quickly, they may still be fed by both parents. Male and female beetles have identical brood care behaviors; however females spend more time provisioning the brood, and males spend more time guarding. Nevertheless, when one member of the pair is removed, the other member compensates by taking over all responsibilities. Furthermore, single males are as successful at raising broods as single females (Vulinec, K. 1995).

**Food Processors**

Insect parents may also process food for their young. Some examples follow: burrowing bugs (genus *Sehirus*) provide seeds to their delicate nymphs, hidden within a soil depression. Treehoppers (genus *Umbonia*) cut a series of spiral slits in the bark, exposing phloem tubes, those that carry nutrients, to their tiny nymphs. Those insects that eat wood face the challenge of converting it from a tough, indigestible food source into a form that their young can use. Wood roaches (genus *Cryptocercus*) and passalid bess beetles solve this problem by feeding their offspring directly from their anus with macerated wood fibers or protozoans (which colonize the intestines and break down cellulose), feces and gut fluids.

**References**


[http://entnemdept.ufl.edu/walker/ufbir/chapters/chapter_14.shtml](http://entnemdept.ufl.edu/walker/ufbir/chapters/chapter_14.shtml)
Balsam Woolly Adelgid
Tanya Borgal

The balsam woolly adelgid (BWA) is a tiny insect native to central Europe that was accidentally introduced into Nova Scotia in 1910. This insect feeds only on true firs (Abies spp.) making it a serious pest for our native balsam fir. The feeding from BWA can result in distorted stems or “gouting” and dead tree tops (Fig. 3). Attacks on larger branches and trunks causes restricted growth, fiber compression and eventually death.

BWA has two generations per year and they overwinter as a dormant nymph. The presence of BWA on a tree can be checked by sampling some mid-crown branches and placing them in water to bring the nymphs out of dormancy.

http://www.gov.ns.ca/natr/forestprotection/foresthealth/sheets/BWAPP.asp

BWA disperses by young crawlers, wind, birds and mammals. The most effective control option is to remove and destroy (i.e., burn) the infested trees, preferably in winter or before the BWA move out of dormancy in early spring (i.e., early May).

Since 2000, forest health has been monitoring the BWA population by visually inspecting random branch tips for overwintering nymphs. These branch tips came from branch samples that were collected for the Balsam Fir Sawfly overwintering egg niche survey and the majority of samples were collected in the Eastern Region of the province. Results for this survey were summarized in past issues of the Insectary Notes as BWA overwintering nymph and damage surveys. Figures 4 and 5 show the results for last year's survey.
In order to provide a better means of measuring BWA damage and changes in the adelgid population, 14 permanent sample plots were established in the Fall of 2009 (Fig. 6). The number of plots will be expanded this spring to have at least 2 permanent plots in each of the ecoregions. The objective of the BWA permanent monitoring plots is to measure BWA damage and changes in the adelgid populations across the province. At each plot there will be annual measurements of adult BWA populations and the tree condition will be assessed and placed into damage rating classes. A datalogger will record the minimum and maximum temperature within each plot. Growth parameters, such as diameter at breast height and tree height, will also be measured for sample trees within the BWA monitoring plots. Whenever possible the BWA monitoring plots were paired with existing Forest Inventory research permanent sample plots in order to compare over time the impact of the adelgid on the growth, volume, and yield of balsam fir.

This survey will help predict the severity of attacks within each ecoregion. Temperature is the known limiting factor for BWA populations; therefore, minimum temperature recorded at each plot will influence present populations of BWA and in turn provide information in order to forecast the severity of BWA attacks across the province.
The Last Laugh

True Entrepreneur
A mall manager has three spaces to rent, all in a row. A prospective lessee shows up and says he wants to rent the space on the left for a men's wear shop.

"That's fine," the mall manager says. "You get free signage; what do you want on the sign?"

"Men's Wear," says the man.

A second guy comes along and asks to rent the right hand space for his gentleman's formal wear business. When asked he says he wants "Men's Wear" on his sign. The mall manager tells him that the left hand shop will have the same sign. "No problem," says the man.

Finally a third man comes along to rent the middle space. The manager is somewhat concerned because this guy also has a men's wear shop. Warily the manager asks the third man what he wants on his sign.

The guy replies: "Entrance."

A mother's four-year-old daughter was attending her first performance of the Ice Capades. She was so mesmerized that she wouldn't budge from her seat even during intermission, watching the activity while the ice was cleaned.

At the end of the show, she exclaimed, "I know what I want to be when I grow up!"

The mother envisioned her on the ice in another 15 years, starring in the Ice Capades. She was brought back to earth when the daughter continued, "I want to be a Zamboni driver!"

Blowing Out The Match
On his first day working at the gas station, John watched a senior co-worker measure the level of gasoline in the underground tanks by lowering a giant measuring stick down into them.

"What would happen if I threw a lit match into the hole?" John said as a joke.

"It would go out," the co-worker replied in a very factual manner.

"Really?" John asked, surprised to hear that. "Is there a lack of oxygen down there or some safety device that would extinguish it before the fumes ignited?"

"No, the force from the explosion would blow out the match."

Because John was processing his first accident report at the transport company where he worked, he was being particularly attentive.

The driver had hit a deer on the highway, and the result was a severely damaged hood and fender. John's serious mood was broken, however, when he reached the section of the report that asked, "Speed of other vehicle?"

The driver had put, "Full gallop."