

Proceedings of the 65<sup>th</sup> Annual Meeting of the  
Acadian Entomological Society  
June 19-21, 2005 at the  
Lord Beaverbrook Hotel, Fredericton, NB



## Program

### Sunday, June 19, 2005

13:00 - 16:00 Insect collecting blitz at Odell Park. We will meet in the lobby of the Lord Beaverbrook Hotel, 659 Queen St., Fredericton at 13:00 and proceed to Odell Park.

19:00 - 21:00 Registration & Mixer, Lord Beaverbrook Hotel

### Monday, June 20, 2005

0800 Registration – Lord Beaverbrook Hotel

0845 Welcome and Introductions

0900-1200 *Insects in the Urban Landscape*

0900 **Jon Sweeney** – Urban forests as the gateway for invasive insects.

0930 **Krista Ryall**, Heidi Fry and Peggy Dixon – An update on research on the elm spanworm outbreak in St. John's, Newfoundland. **(cancelled)**

1000 Refreshment break

1030 **Don Murray** – History of managing Dutch elm disease and other pests in Fredericton, NB.

1100 **Reggie Webster** – Mosquito species richness in urban vs rural habitats in New Brunswick.

1130 **Garth Nickerson** - IPM of the Hairy Chinch Bug (*Blissus leucopterus hirtus* Montandon) in New Brunswick.

1200 Lunch

1330-1600 *Student Paper Presentations*

- 1330 **Pauwlina Dexter** - An Empirical Demonstration of *Moericke's* Flight model – Synchronizing aphids into Settling after Flight. (S)
- 1345 **Girish Narayandas** - Response of potato aphid to natural potato foliage odor, synthetic potato-derived Colorado potato beetle attractant and its blank inert carrier. (S) (Presented by A. Alyokhin)
- 1400 **Andrew Morrison** - Plant heterogeneity influences the preference and performance of a gall midge, *Harmandia tremulae* (Winnertz), on trembling aspen (*Populus tremuloides* Michx.). (S)
- 1415 **Natalie Henneberry** - Transmission of a Baculovirus in *Neodiprion abietis*. (S)
- 1430 **Rob Johns** - Intra-tree foraging behavior of a specialist herbivore larva: Influence of larval sex and foliage quality. (S)
- 1445 **Kathryn Miller** - Arboreal lichen and invertebrate associations and impacts of gap harvesting. (S)
- 1500 Refreshment Break
- 1530 **Richard Rogers** - A field method for evaluating the toxicity of crop protection products to honey bee brood. (S)
- 1545 **Donna Giberson** - Effects of spraying Bti for mosquito control on non-target nematocera in salt marshes on PEI.
- 1600 **Andrei Alyokhin** - Plant-mediated effects of soil amendments on the Colorado potato beetle.
- 1615 **Yvan Pelletier** - Resistance of a wild potato to the Colorado potato beetle.
- 1630 **AES Annual Business Meeting**
- 1800 Cocktails (cash bar)
- 1830 **Banquet**

## **Tuesday, June 21, 2005**

- 0900 **Dan Quiring** - Genetically-based resistance of black spruce to the yellow-headed spruce sawfly.
- 0915 **Stephen Woods** - An evaluation of the role of standing dead trees (snags) as a substrate for epiphytes and invertebrates.

- 0930 **John Crowe** – “Hot Zone” insect trapping.
- 0945 **Stephen Heard** - Enemy-free space is an elusive thing: Parasitoid attack rates on gallmakers of two goldenrods
- 1000 Refreshment break
- 1030 **Gilles Boiteau** - Comparative flight capacity of two ubiquitous Coccinellidae: *Harmonia axyridis* (Pallas) and *Hippodamia convergens* G. –M.
- 1045 **Rob Smith** – Seaweed extracts...a mysterious agent in orchard mite management.
- 1100 **Michelle Larsen** – Improving monitoring and management of apple maggot in Annapolis Valley orchards.
- 1115 **Jianhua Zhang**, Claudia Goyer, and Yvan Pelletier - Cloning and sequence analysis of cytochrome P450 from Colorado potato beetle.
- 1130 **Chris Maund** – Agricultural pest update for New Brunswick.
- 1145 **Nelson Carter** - Status of Forest Pests in New Brunswick in 2004 and Outlook for 2005.
- 1200 Closing

## Posters

- Dau-schmidt, Kathryn**, Christine Noronha, Donna Giberson - A method of determining European corn borer infestation levels in potatoes.
- Roger Graves**, Dan Quiring, Chris Lucarotti - The effect of viral infection on gregariousness in balsam fir sawfly populations.
- Christine Noronha** and M.R. Carter - Influence of insecticides on soil microbial biomass and micro-fauna populations in the potato ridge on sandy loams in Prince Edward Island.
- Lauren Pineault**, Robert Anderson, and Jon Houseman - A revision of *Dioptraphorus* Faust and three new genera *Neodioptraphorus*, *Buckingorum* and *Chiapaneca* (Coleoptera: Curculionidae), collected from the region of Chiapas, Mexico.
- Hui Zhou**, K. Mackenzie, and D. Strongman - Adult black vine weevil (*Otiorhynchus sulcatus*) damage to strawberry plants, oviposition and egg viability.
- Christopher Lucarotti** and Edward Kettela - Abietiv – registration of the balsam fir sawfly nucleopolyhedrovirus.

## **The Acadian Entomological Society thanks:**

**Natural Resources Canada, Canadian Forest Service - Atlantic Forestry Centre, Andrei Alyokhin, Cathy Clark, George Fanjoy, Nancy MacDonald, Andrew Morrison, Don Ostaff, Jessica Price, Tony Thomas, and Reggie Webster for kind and generous support of the AES 2005 Annual Meeting.**

## **Abstracts**

**ANDREI ALYOKHIN, REMZI ATLIHAN, GREGORY PORTER, ELEANOR GRODEN, AND FRANCIS DRUMMOND**

Department of Biological Sciences, 5722 Deering Hall, University of Maine, Orono, ME 04469

### **Plant-mediated effects of soil amendments on the Colorado potato beetle.**

For many years, proponents of organic agriculture claimed that organic production systems create a generally unfavorable environment for pest populations. We investigated effects of soil amendment practices on Colorado potato beetle populations and their interactions with crop rotation and conventional vs. biorational pest management approaches. Beetle densities were almost universally lower in plots receiving manure soil amendments in combination with reduced amounts of synthetic fertilizers compared to plots receiving full rates of synthetic fertilizers, but no manure. Crop rotation and pest management approaches had little or no effect. Unlike beetle abundance, plant height and canopy cover were comparable between plots receiving manure and synthetic fertilizer. Furthermore, tuber yields were higher in manure-amended plots. There was a dramatic dissimilarity in mineral composition of potato leaves collected from manure-amended and synthetic fertilizer-treated plots.

To confirm plant-mediated nature of the observed phenomenon, we also conducted a series of no-choice assays comparing Colorado potato beetle reproduction and development on plants grown in manure-amended and synthetically fertilized soils. Female fecundity was lower in field cages set up on manure-amended plots early in the season, although it later became comparable between the treatments. Fewer larvae survived past the first instar, and development of the immature stages was slowed down on manure-amended plots. In the laboratory, first instars consumed less foliage from plants grown in manure-amended soils.

These results demonstrate that organic soil management is associated with plant characteristics unfavorable for beetle reproduction and development. The mineral balance hypothesis originally developed by P. Larry Phelan from the Ohio State University suggests that the organic matter and microbial activity associated with organically managed soils affords a buffering capability to maintain nutrient balance in plants. Evolving on soils amended with natural equivalents of manure and compost, plants developed ability to utilize available nutrients to achieve the most favorable equilibrium between growth, reproduction, and defense against insect herbivores. Using synthetic fertilizers may shift this balance towards growth and reproduction, while compromising defense capabilities of affected plants. This should be taken into consideration when designing fully integrated crop management systems.

#### **GILLES BOITEAU**

Potato Research Center, Agriculture Agri-Food Canada, 850 Lincoln Rd., Fredericton, New Brunswick, Canada E3B 4Z7

#### **Comparative flight capacity of two ubiquitous Coccinellidae: *Harmonia axyridis* (Pallas) and *Hippodamia convergens* G. -M.**

The multicolored Asian lady beetle has recently become an important insect species in agriculture and urban environments. Introduced for its tremendous potential in biological control it has drawn more attention for its non-target effects as a pest of fruit and people than for its pest control successes. The convergent ladybeetle is a very effective native biological control insect that has become the ladybeetle of choice in gardening catalogs. However, there is remarkably little information available on the dispersal of these beetles outside of their migratory flights. The study was undertaken to assess the potential of portable harmonic radar technology for the tracking of beneficial insects but the results also provide some insights into the successful spread of *H. axyridis*. The presentation will use data on wing loading, maximum body weight for flight and flight propensity to compare the flight capacity of the two species.

#### **NELSON CARTER, L. HARTLING AND D. LAVIGNE**

NB Natural Resources, 1350 Regent Street, Fredericton, NB, E3C 2G6

#### **Status of forest pests in New Brunswick in 2004 and outlook for 2005.**

Many pests being monitored were at or below detectable low levels in 2004. Low-density Spruce Budworm populations continued to show small increases since 1997. Whether this is the harbinger of the next outbreak remains to be seen. No defoliation expected in 2005. Hemlock Looper had a Province-wide 2.5-fold increase in the average number of moths caught, but egg survey results indicate no areas of defoliation expected in 2005. No defoliation by Gypsy Moth was aurally detected. None is expected in

2005. Additions to the areas regulated by the Canadian Food Inspection Agency are expected. Forest Tent Caterpillar moth catches do not suggest rising populations. Several new sites with Butternut Canker were confirmed positive by the CFS. This disease is killing vast areas of butternut in the United States, and could threaten NB's natural biodiversity. Butternut trees may be named under the Canadian *Species at Risk Act* in 2005. Fir trees with symptoms of Balsam Woolly Adelgid attack are common in southern NB. Beech mortality and Beech Bark Disease are noticeable in west-central and north-western NB. Balsam Twig Aphid populations declined in the past three years and further decline is anticipated in 2005. Balsam Gall Midge populations should remain low in 2005. Variable Oak Leaf Caterpillar caused localized hardwood defoliation in 2004 and nests of the Fall Webworm were common on roadside hardwood trees throughout the Province. No Brown Spruce Longhorn Beetle or Pine Shoot Beetle was detected. The aerial survey detected patches of hardwood dieback, possibly caused by miscellaneous insects, diseases and abiotic factors over past years. Minor pest problems occurred in some DNR seed orchards; but none were reported at the Kingsclear Tree Nursery.

#### **JOHN CROWE**

United States Department of Agriculture, Animal Plant Health Inspection Service – Plant Protection and Quarantine, Maine, USA

#### **Hot Zone Insect Trapping in Maine.**

With the increase of global trade comes an increase of the risk of exotic pest introductions. Therefore, there is an elevated need for a definitive trapping protocol in order to monitor for pest populations within the United States and Maine. The United States Department of Agriculture has developed a working idea called, "Hot Zone Trapping." It requires targeted trapping in urban environments and international trade zones. One example of this method of trapping is the Exotic Bark Beetle Survey which focuses on 10 wood boring pests but all Scolytinae, Cerambycidae and Buprestidae are also identified. Three lure types are used at each trap location; Ethanol, Ethanol and Alpha-pinene and Ips lures. To date, the Maine Forest Service and the Maine Department of Agriculture have identified seven bark beetles not known to occur in the state while utilizing the USDA's Exotic Bark Beetle Protocol. Though none were on the targeted list nor required regulatory action, most represent the first detection of a large range expansion into Maine. The beetles newly trapped in 2004 include: *Hylastes opacus* Erichson, *Hylastinus obscurus* Marsham, *Trypophloeus populi* Hopkins, *Xyleborinus alni* Niisima, *Xyleborus pelliculosus*, *Xylosandrus germanus* Bland, and *Corthylus punctatissimus* Zimmerman.

**KATHRYN DAU-SCHMIDT<sup>1,2</sup>, CHRISTINE NORONHA<sup>1</sup>, AND DONNA GIBERSON<sup>2</sup>**

<sup>1</sup>Agriculture and Agri-food Canada, Crops and Livestock Research, Charlottetown, PE;

<sup>2</sup>Department of Biology, University of Prince Edward Island, Charlottetown, PE

### **A method of determining European corn borer infestation levels in potatoes. (Poster)**

The European corn borer (*Ostrinia nubilalis*, ECB) is a polyphagous moth, the larvae of which tunnel inside the stems of host plants consuming tissue as they mature. Once inside the stem they are protected from most insecticide applications and all but very specialized predators. While the ECB has historically been more important as a pest in corn (*Zea mays*), since around 1987 it has become an important pest in potatoes (*Solanum tuberosum*) in the Atlantic Provinces and Maine. Because the larvae are hidden inside the potato stems, the level of ECB infestation in potatoes can be hard to determine, often requiring the researcher to cut open potato stems to count larvae, which is very labour intensive and time consuming.

At the end of the 2004 growing season a total of 3085 stems were collected from potato plants in 55 plots set up in potato fields as part of a variety of research projects. Each potato stem was cut open and the number of ECB larvae, larval entry holes, and larval tunnels was recorded for each individual potato stem and plant.

The results of this work showed that the number of larval entry holes significantly correlated with the number of larvae in either the individual potato stems or potato plant. Therefore, ECB infestation levels in potatoes can be determined by simply counting larval entry holes in the potato stems.

**PAUWLINA DEXTER<sup>1,2</sup> AND YVAN PELLETIER<sup>2</sup>**

<sup>1</sup> Population Ecology Group, Department of Biology, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6C2

<sup>2</sup> Insect Physiology Laboratory, Potato Research Center, Agriculture Agri-Food Canada, 850 Lincoln Rd., Fredericton, New Brunswick, Canada E3B 4Z7.

### **An empirical demonstration of *Moericke's* flight model – synchronizing aphids into settling after flight. (Student Presentation)**

Historically, the transition between aphid flight and host plant acceptance has been studied as individual elements of aphid flight and insect – plant interaction. Here we present an empirical demonstration of sequential aphid flight stages outlined in *Moericke's* flight model and a method of synchronizing flying aphids into a host ready settling stage. The pre - foraging flight propensity of two aphid species, *Myzus persicae* (Sulzer) and *Macrosiphum euphorbiae* (Thomas) was observed for flight stages described in *Moericke's* flight model using a new observation chamber. The chamber was designed based on the assumptions that flying aphids are visually attracted to light early in the “distance flight” stage, that they will not readily accept a host plant until after flying for a minimum period of time, and that aphids are visually attracted to the yellow pigment of

foliage during the “attack flight” stage. Aphids’ flight tendencies were observed for patterned stages and the duration of “distance flight” and “attack flight” stages were estimated. Aphids did not fly in the absence of light, suggesting that light is likely a necessary stimulus for flight initiation. The estimated duration of the “distance flight” stage differed between aphid species; however both species alighted and began “settling” on host plants after flight stages were completed. “Probing” behaviour immediately followed “alighting” and “walking” when aphids were placed on desirable host plants. These results suggest that the sequential flight stages in *Moericke’s* flight model are readily seen in the new observation chamber and subsequently it is an effective apparatus for synchronizing aphids to settling after flight.

**DONNA J. GIBERSON**

Department of Biology, University of Prince Edward Island, Charlottetown, PEI, C1A 4P3

**Effects of salt marsh mosquito treatment with Bti on non-target nematocera and tree swallows in 5 salt marshes on PEI.**

Five salt marshes were monitored in 1993 to determine whether Bti treatment for nuisance mosquitoes had any effect on non-target nematocera or on insectivorous birds. Two of the marshes were treated and three were untreated, and insects were sampled throughout the summer using emergence traps. Forty-three species of Nematocera were recorded from the five marshes. Diversity was lower in treated marshes, with several species only occurring in untreated marshes. Overall abundance of Nematocera was similar in all marshes but seasonal patterns differed, with treated marshes having significantly lower summer emergence than untreated ones. This time period corresponded to a time when swallow food requirements were still high, and may have forced the swallows to forage further afield in treated marshes.

**ROGER GRAVES<sup>1</sup>, DAN QUIRING<sup>1</sup> AND CHRIS LUCAROTTI<sup>2</sup>**

<sup>1</sup> Population Ecology Group, University of New Brunswick, Faculty of Forestry and Environmental Management

<sup>2</sup> Natural Resources Canada, Canadian Forest Service, PO Box 4000, Fredericton, NB

**The effect of viral infection on gregariousness in balsam fir sawfly populations.**  
(Poster)

Manipulative experiments investigated the influence of baculovirus infection on gregarious feeding and subsequent dispersal behaviour of balsam fir sawfly (*Neodiprion abietis*) larvae, and on the oviposition behaviour of adult females. Our results suggest that the susceptibility of larvae to its nucleopolyhedrovirus (NeabNPV) was not influenced by the amount of NeabNPV introduced to groups of larvae, the number of infected larvae introduced to groups, larval dispersal behaviour or oviposition behaviour.



Feeding in groups as young larvae poses a substantial risk for NeabNPV transmission. In contrast to many lepidopteran species, NeabNPV infection in balsam fir sawflies does not appear to alter larval dispersal behaviour or oviposition by adult females.

**STEPHEN B. HEARD**

Department of Biology, University of New Brunswick, Fredericton, NB

**Enemy-free space is an elusive thing: Parasitoid attack rates on gallmakers of two goldenrods.**

Models of host-race formation in insect herbivores often postulate that herbivores attacking a novel host experience reduced attack by their parasitoids, and that this enemy-reduced space (ERS) can help drive host shifts because it compensates for poor physiological adaptation to the novel host. Several studies have reported patterns of ERS on novel host plants, but such studies typically involve limited, if any, replication across years, sites, or herbivore species. I examined patterns of parasitoid attack on two gallmaking herbivores of goldenrods (*Solidago altissima* and *Solidago gigantea*). The gelechiid moth *Gnorimoschema gallaesolidaginis* has a pair of cryptic but genetically distinct host races on those goldenrods, with *S. gigantea* being the novel host; the tortricid moth *Epiblema scudderiana*, in contrast, is a host generalist attacking both goldenrods. I collected galls from both goldenrod species in mixed-species populations across eastern and midwestern North America, scoring the rate of parasitoid attack across plant species, site, and year. For neither herbivore was there any consistent ERS on either host-plant species; instead, ERS was dynamic in both space and time. The direction of ERS (i.e., lesser attack on *S. altissima* or on *S. gigantea*) can even be reversed at a single site from one year to the next. If ERS plays an important role in host shifting and host-race formation, that role is likely to be temporally and spatially complex.

**NATALIE J. HENNEBERRY<sup>1</sup>**, **CHRISTOPHER J. LUCAROTTI<sup>2</sup>**, **BENOIT MORIN<sup>2</sup>** AND **DAN T. QUIRING<sup>1</sup>**

<sup>1</sup> Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6C2

<sup>2</sup> Natural Resources Canada, Canadian Forest Service-Atlantic Forestry Center, P.O. Box 4000, Fredericton, New Brunswick, Canada E3B 5P7

**Is there vertical transmission of a nucleopolyhedrovirus in *Neodiprion abietis*?**  
(Student Presentation)

Since the early 1990's, the balsam fir sawfly (BFS- *Neodiprion abietis*) has become a serious pest of high-value balsam fir forests in western Newfoundland. Normally, a species-specific nucleopolyhedrovirus (NeabNPV) spreads rapidly through horizontal

transmission within a generation and will suppress outbreak populations within a year or two of the populations reaching peaking levels. However, the dynamics of NeabNPV between generations is not known. Field and laboratory studies were performed in an attempt to observe the transmission dynamics of NeabNPV between generations and possible sublethal effects on individual fitness. Various environmental substrates (i.e. soil, needles) were examined for the presence of NeabNPV. Vertical transmission was not observed between generations. Sublethal effects of NeabNPV were limited to lower lifetime fecundity. NeabNPV was not isolated from the environmental substrates examined.

**ROB JOHNS AND DAN QUIRING**

Population Ecology Group, University of New Brunswick, Faculty of Forestry and Environmental Management, Fredericton, NB

**Intra-tree foraging behavior of a specialist herbivore: Influence of larval sex and foliage quality. (Student Presentation)**

Over evolutionary time, some herbivorous insects may adapt foraging behaviors to overcome the heterogeneous distribution of suitable food within and among their host-plants. Most studies have focused on how variation among plants affects insect foraging and fitness, despite evidence for comparable variability within plants. Consequently, the proximate and ultimate factors influencing insect foraging behavior within their host-plant are still poorly understood.

I evaluated the effects of within plant variation in foliage quality on the foraging behavior and fitness of yellow-headed spruce sawfly, the most important pest of young black spruce in Atlantic Canada. Feeding larvae can cause severe growth loss or apical shoot mortality, due presumably to preferential feeding at the crown apices.

Based on field surveys, most eggs are laid in the lower two-thirds of the tree. Late-instar larvae, especially females, disperse acropetally throughout the crown of black spruce, beginning at inner mid-crown positions and dispersing upwards and outwards. Manipulative field experiments supported the hypothesis that the observed foraging strategy is adaptive, particularly for females: early and late instar larvae performed best when feeding in the lower and upper crown, respectively. The additive and/or interacting influences on performance of intra-tree variation in phenology, foliage quality, microenvironment, parasitism, and herbivore density were evaluated and will be discussed. This behavior, previously described for a caterpillar, has never been observed in a sawfly and further emphasizes the important influence on insect behavior and performance of within plant heterogeneity.

**MICHELLE L. LARSEN AND ROB F. SMITH**

Atlantic Food and Horticulture Research Centre, AAFC, 32 Main Street, Kentville, NS, B4N 1J5, Phone: 902-679-5549

### **Improving monitoring and management of apple maggot in Annapolis Valley orchards.**

Apple maggot (AM), *Rhagoletis pomonella* (Walsh), is a common Nova Scotia apple pest that requires at least one harsh, broad-spectrum insecticide for control annually. Questions central to the successful management of this pest posed in this study included 1) Is the decreased focus on wild host removal to blame for the rise in AM prevalence? 2) How frequently do monitoring traps need to be changed to remain efficient? 3) Are there new products that can offer the same level of fruit protection as organophosphates? Evidence showed that AM immigration from adjacent wild hosts (wild apple and hawthorn) along the orchard perimeter may be responsible for increased occurrence of fruit injury experienced in recent years. The common practice of leaving yellow baited cards unchanged throughout the season greatly decreased maggot detection capabilities within 30 days of set-up. AM-inflicted fruit damage was 10% lower in commercial organic orchards which used SURROUND WP compared to untreated blocks. In paired field trials, SURROUND WP provided equivalent levels of fruit protection as compared to conventional pesticides.

**CHRISTOPHER LUCAROTTI AND EDWARD KETTELA**

Canadian Forest Service, Atlantic Forestry Centre, Natural Resources Canada, P.O. Box 4000, Fredericton, NB E3B 5P7

### **Abietiv – registration of the balsam fir sawfly nucleopolyhedrovirus. (Poster)**

In 1997, we isolated a nucleopolyhedrovirus (NeabNPV) from the balsam fir sawfly (*Neodiprion abietis*). The balsam fir sawfly had become a major defoliator of pre-commercially thinned balsam fir stands, especially in western Newfoundland, beginning in the early 1990's. With no control measures in hand, NeabNPV was developed as an agent for the biological control of balsam fir sawfly. To this end, research was carried out on a number of fronts including NeabNPV field efficacy, studies on mammalian and non-target invertebrate toxicology, balsam fir sawfly life table, ecology and impact on balsam fir trees and NeabNPV genome sequencing and analysis. As part of the field efficacy trials 17,550 hectares of balsam fir sawfly infested forest were aerially treated with NeabNPV between 2000 and 2004. Results from all of the research, both basic and applied, were included in the submission to the Pest Management Regulatory Agency (Health Canada) in June 2004 for the registration of NeabNPV under the trade name, Abietiv.

**KATHRYN M. MILLER AND STEPHEN A. WOODS**

Department of Biological Sciences, 5722 Deering Hall, University of Maine, Orono, ME 04469

**Arboreal lichen and invertebrate associations and impacts of gap harvesting.**  
(Student Presentation)

Despite their role in virtually all forest processes, arboreal invertebrate communities in northern temperate forests are understudied, with knowledge especially lacking for non-pest invertebrates. Consequently, little is known about their habitat requirements and sensitivity to forest management. The goals of this research were to describe the arboreal invertebrate community in the Acadian spruce/fir forest, explore invertebrate associations with lichen epiphytes, and to examine the influence of harvested canopy gaps on these taxa. Sample trees were located in research areas established by the Forest Ecosystem Research Project (FERP) in the Penobscot Experimental Forest in Bradley, Maine, USA. Sample trees consisted of red maple (*Acer rubrum*) between 11 and 45 cm dbh, and were located either in continuous forest, or in canopy gaps harvested between 1995 and 1998. Invertebrate collections and estimation of lichen percent cover occurred along the south-facing bole of each tree at three vertical intervals (0-2m, 2-4m, and 4-6m). Epiphyte species composition varied considerably with height, and several lichen species were found to have slightly greater abundance in continuous forest. This may be the result of gradual decline in abundance due to post-harvest changes in microclimate. The most abundant invertebrate orders included Acari (mites), Collembola (springtails), Diptera (flies), Psocoptera (bark lice), and Araneae (spiders), respectively. Collembola and Araneae were highly correlated ( $r=0.68$ ), and were greater on trees in continuous forest. In addition to order level analysis, Collembola were sorted to morphs within families. Collembola morphs had varying preference to tree location (continuous canopy vs. gap) and bole height. Additionally, interactions between Collembola morphs and abundance of the epiphytes Bryophyte, *Hypogymnium physodes*, and *Leptogium cyanescens* were significant. Future efforts will focus on family-level analysis of other major invertebrate orders, and may expand sample height and/or include pitfall traps.

**ANDREW MORRISON**

Population Ecology Group, Faculty of Forestry and Environmental Management,  
University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6C2

**Plant heterogeneity influences the preference and performance of a gall midge, *Harmandia tremulae* (Winnertz), on trembling aspen (*Populus tremuloides* Michx.).**  
(Student Presentation)

Field studies were conducted to evaluate the influence of the host plant on the preference and performance of a gall-inducing midge, *Harmandia tremulae* (Winnertz), on trembling aspen. Females selected oviposition sites preferentially on younger leaves in the upper crown, where galls performed best. Gall size, which was positively correlated to larval survival and weight, was highest for galls on mid veins located close to the petiole. These

results support the plant vigour and optimal module size hypotheses, which predict that galler performance in initiated galls is highest on larger modules. Although most galls were on mid veins, many were on lateral veins at a considerable distance from the petiole, indicating that many females and larvae selected oviposition and galling sites sub-optimally. This study suggests that small-scale variations in plant quality within leaves can render the selection of gall site by juveniles as important as that previously reported for adult females.

## **DON MURRAY**

City Forester, City of Fredericton, NB

### **44 Years of Dutch Elm Disease in Fredericton.**

Dutch elm disease was first discovered in North America in Ohio in 1930; Canada, in the Province of Quebec in 1944; and in Woodstock, NB in 1957. The streets and streams of most communities in New Brunswick were lined with a monoculture of mature and majestic white elm trees; soon to be threatened by the killing disease. The measures taken by communities to protect these trees varied from a “let the disease run its course” attitude to “develop a program to fight the disease”.

Forewarned to the devastation of the impending Dutch elm disease by the Forest Biology Laboratory (predecessor to Natural Resources Canada) in the 1930's, Fredericton City Council became interested in the care of its shade trees. In the late 1940's a tree advisory committee was appointed and in 1952 a City by-law established a permanent Tree Commission. The primary duties of the Commission were to formulate plans for an aggressive tree-planting program and to develop a strategy to battle Dutch elm disease.

Sanitation of the elm population was chosen as the cornerstone of the protection program. Extensive pruning, removal of dead and decadent trees and constant surveys were performed prior to the discovery of two infected trees in 1961. From 1961 to present, the Fredericton Tree Commission and the City has remained dedicated to a program of **Survey – Sanitation – Tree Planting** in order to ensure Fredericton has a healthy and thriving tree population. An increase in staffing and upgrading of equipment was required to meet the tree maintenance needs as the tens of thousands of planted trees matured and the success of the sanitation program resulted in many of the elms being saved.

Even though Fredericton doesn't have the elm-lined streets that existed in the 1960's and 1970's, the aggressive tree-planting program has resulted in Fredericton's streets still being canopied with an uneven-aged and multi-species thriving forest.

**GIRISH K. NARAYANDAS AND ANDREI V. ALYOKHIN**

Department of Biological Sciences, 5722 Deering Hall, University of Maine, Orono, Maine 04473

**Response of potato aphid to natural potato foliage odor, synthetic potato-derived Colorado potato beetle attractant and its blank inert carrier. (Student Presentation)**

The response of both alatae and apterae of the potato aphid, *Macrosiphum euphorbiae*, to natural potato foliage odor and synthetic potato-leaf derived Colorado potato beetle kairomone odor was tested in a Y-tube olfactometer. Aphid response to untreated potato foliage, foliage treated with synthetic potato leaf derived kairomone, and foliage treated with inert blank carrier was tested in Petri dishes. Aphid densities on field plots treated with kairomone and blank inert carrier were compared with the control plots. The odor of 3-4 week old potato foliage was found to be attractive to the adult stage of both winged and wingless potato aphids. The synthetic Colorado potato beetle kairomone odor was not attractive to aphids. In Petri dishes, aphids avoided leaflets treated with both kairomone formulation and its blank carrier. There was no statistical difference between the treatments compared in the field.

A. WELLWOOD<sup>1</sup>, G. NICKERSON<sup>1</sup> AND J. WETMORE<sup>2</sup>

<sup>1</sup> New Brunswick Agriculture, Fisheries and Aquaculture, Agriculture Development Branch, P.O. Box 6000, Fredericton, NB, E3B 5H1

<sup>2</sup> Wetmore's Landscaping, 3708 Highway 102, Island View, NB, E3E 1G3

**Hairy Chinch Bug survey, demonstration and monitoring in New Brunswick, 2002.**

Hairy chinch bug, *Blissus leucopterus hirtus*, populations were surveyed in 5 regions of New Brunswick (Bathurst, Grand Falls, Moncton, Fredericton, and Rothesay) in 2002 to establish monitoring, threshold and treatment guidelines. A total of 23 chinch-infested lawns were monitored. Floatation and quadrat monitoring techniques were compared. Monitoring was done weekly for 12 weeks (June to August) in all locations and continued for an additional 9 weeks at 2 locations to observe 2nd generation insect development. The quadrat monitoring method was as effective as the floatation method for guiding insect control decisions. The quadrat treatment threshold adopted was 10 chinch bugs per 0.1m<sup>2</sup> (Rochefort *et al*, 1997), for a 60 second search while the 10-minute floatation threshold used was 22-32 chinch bugs per 0.1m<sup>2</sup> (Health Canada, 2000; Emmons, 2000). Treatments for chinch bug should be applied at the peak of the combined 2nd and 3rd instar populations. In 2002 the combined populations peaked in Bathurst, Fredericton, Moncton, and Rothesay between 423 and 877 degree-days (7°C base, air temperature). This indicates an optimum treatment window for hairy chinch bug between mid-July and mid-August in New Brunswick. Pest control intervention is not always necessary for above threshold populations of chinch bug. Treatment decisions must also consider the health of the lawn, history of previous insect damage, soil depth and quality, thatch levels, plant species mix (grass and broadleaf), and general turf maintenance practices (fertility, mowing height/frequency). It was found that lawns with

high populations of broadleaf plants ( 10%) showed less visible damage from chinch bug feeding even with chinch bug populations that were well above treatment threshold levels.

**CHRISTINE NORONHA AND M.R. CARTER**

Crops and Livestock Research Centre, Agriculture and Agrifood Canada, 440 University Avenue, Charlottetown, PEI, C1A 4N6.

**Influence of insecticides on soil microbial biomass and micro-fauna populations in the potato ridge on sandy loams in Prince Edward Island. (Poster)**

Application of pesticides in intensive potato (*Solanum tuberosum* L.) production systems may influence soil biological properties. The effect of insecticide applications on soil microbial biomass and soil micro-fauna, in the potato ridge, was examined in the potato phase of 3-year rotations at two sites in Prince Edward Island, over a two year period. At each site, the experiment consisted of an in-furrow insecticide application at planting (which served as a control) compared to multiple foliar insecticide applications. Soil samples were obtained from the 0 to 8 cm soil depth of the potato ridge in the spring after planting, and in the fall before harvest. Soil microbial biomass was determined using the fumigation direct extraction procedure, while micro-fauna (collembola and mites) populations were determined using a modified Tullgren extractor. Results showed a significant decrease in collembola population following multiple foliar insecticide applications as compared to a single in-furrow application. In the complete absence of insecticide use, or only one application, collembola populations were significantly higher than in the in-furrow treatment. Comparison of spring and fall samples within each treatment showed a significant decrease over the summer when multiple insecticides were applied, 61% and 76%, at the two sites. Mite populations, on the other hand, were not detrimentally affected by the use of multiple foliar insecticide applications, and populations were not significantly different in the two treatments. Overall, mite populations were lower in the spring and increased over the summer. Soil moisture levels had a negative impact on collembola populations; drought conditions experienced over the growing season in 2001, resulted in an overall decrease in collembola numbers; however mite populations were not as severely affected by lower soil moisture and increased over the summer. Our results showed that microbial biomass decreased significantly when multiple foliar insecticide were applied as compared to a single in-furrow application. Thus, multiple insecticide applications negatively impact collembola populations and microbial biomass, but mite populations are not as severely impacted.

**YVAN PELLETIER**

Potato Research Center, Agriculture Agri-Food Canada, 850 Lincoln Rd., Fredericton, New Brunswick, Canada E3B 4Z7

### **Resistance of a wild potato to the Colorado potato beetle.**

The first step in insect resistant cultivar development is to identify resistant parent and understand their mode of action. Ten species of wild tuber-bearing *Solanum* species are known for their resistance to the Colorado potato beetle, including *S. tarijense* Hawkes. It originates and is widely distributed in Argentina, Bolivia and Peru.

Earlier work indicated that *S. tarijense* is very resistant to the Colorado potato beetle in field situation. Furthermore, colonization by adults and oviposition are greatly reduced but larval survival is not affected. The objectives of this study were to understand the mechanism of resistance of *S. tarijense* to the Colorado potato beetle. Since the effect of *S. tarijense* on the Colorado potato beetle is limited to the adult stage, a detailed evaluation of host selection behaviour should provide information on the mechanism of resistance.

A higher proportion of the beetles placed on a leaflet of *S. tarijense* in the field fell (73%) from the plant compared to *S. tuberosum* plants (7%). In laboratory experiments, twelve of 20 beetles observed on a *S. tarijense* fell. Removal of the trichomes of *S. tarijense* did not change the behaviour of the beetles but significantly reduced the proportion of beetle falling off the stem to a level similar to *S. tuberosum*. Adults consumed 8.6 grams of *S. tarijense*, significantly less than the 20.61 gm of *S. tuberosum* that was consumed.

Consumption of potato leaf disks treated with the raw extract of *S. tarijense* ( $5.9 \pm 0.55$  cm<sup>2</sup>) was less than those treated with the raw extract of *S. tuberosum* ( $8.3 \pm 0.53$  cm<sup>2</sup>) or methylene chloride ( $8.6 \pm 0.50$  cm<sup>2</sup>). The time distribution of the behaviour of the adult Colorado potato beetle in term of contact with the leaf material and feeding was significantly affected by treating potato leaf disks with the volatile fraction from *S. tarijense* compared with treatment with fraction from *S. tuberosum* of the solvent control.

**LAUREN PINEAULT**<sup>1</sup>, **ROBERT ANDERSON**<sup>2</sup> AND **JON HOUSEMAN**<sup>3</sup>

<sup>1</sup> 920 Hare Avenue, Ottawa, ON Canada K2A 3J4 e-mail: Lauren.Pinault@gmail.com

<sup>2</sup> PO Box 3443 Stn D, Ottawa, ON Canada K1P 6P4 e-mail: RAnderson@mus-nature.ca

<sup>3</sup> University of Ottawa, Faculty of Science, 140 Louis Pasteur St., Ottawa, ON Canada K1N 6N5 e-mail: [Houseman@uottawa.ca](mailto:Houseman@uottawa.ca)

**A revision of *Dioprophorus* Faust and three new genera *Neodioprophorus*, *Buckingorum* and *Chiapaneca* (Coleoptera: Curculionidae), collected from the region of Chiapas, Mexico. (Poster)**



Through the process of this review, three new genera are proposed, each related to *Dioptraphorus* (Faust): *Chiapaneca*, *Buckingorum*, and *Neodioptraphorus*. 24 novel species originally classified as part of the weevil genus *Dioptraphorus* (Coleoptera: Curculionidae), from the state of Chiapas, Mexico, are identified, described, and keyed in this study. Chiapas is an area encompassing many different isolated patches of ecosystems, allowing a large diversity of species to have evolved. The 24 species' type material is housed in the Canadian Museum of Nature collection (R. Anderson). The specimens were collected by R. Anderson, S. Peck, and R. Jones.

At present, the new species are named: (*Dioptraphorus*): *D. ocosingus* sp. nov., *D. vepresis* sp. nov., *D. chanticus* sp. nov., *D. duni* sp. nov., *D. metzli* sp. nov., *D. cakulhi* sp. nov., *D. tlalocus* sp. nov., and *D. housemani* sp. nov., (*Chiapaneca*): *C. morena* sp. nov., (*Buckingorum*): *B. acani* sp. nov., *B. lanatus* sp. nov., *B. harrisonae* sp. nov., *B. horsleyae* sp. nov., *B. andersoni* sp. nov., *B. camaxtli* sp. nov. and *B. brutus* sp. nov., (*Neodioptraphorus*): *N. katapheres* sp. nov., *N. jonesi* sp. nov., *N. rampersadi* sp. nov., *N. ahulanus* sp. nov., *N. charbonnae* sp. nov., *N. smithi* sp. nov., *N. pinaulti* sp. nov., and *N. chamerus* sp. nov.

The biogeography of these species stresses the conservation importance of pockets of montane and cloud forests near San Cristobal, Angel Albino Corzo, and Volcan Tacana, since these areas have a high incidence of endemism and species richness.

**DAN QUIRING<sup>1</sup>**, ALICE VERREZ<sup>1</sup>, THIBAUT LEINKENKAL LE COCQ<sup>1</sup>, AND YILL-SUNG PARK<sup>2</sup>

<sup>1</sup> Population Ecology Group, Faculty of Forestry and Environmental Management, University of New Brunswick, Fredericton, New Brunswick, Canada E3B 6C2

<sup>2</sup> Natural Resources Canada, Canadian Forest Service, Fredericton, NB

### **Genetically-based resistance of spruces and pines to insect pests.**

Field studies were carried out to determine whether there was a genetic basis to resistance of white and jack pine, *Pinus strobus* L. and *P. banksiana* Lamb., to the white pine weevil, *Pissodes strobi*, and to resistance in black spruce *Picea mariana* (Mill), to the yellowheaded spruce sawfly, *Pikonema alaskensis*. Individual and family heritabilities of resistance were moderate to high for all three trees, indicating that breeding resistant trees is possible and should be included as a component in pest management programs for these pests.

**RICHARD E.L. ROGERS**

MSc, PAg, PhD Candidate (Wageningen U), Wildwood Labs Inc, Kentville, Nova Scotia, Canada

## **Toxicity of selected crop protection products to honey bee brood.**

In response to reports of reduced wintering success of honey bee colonies and unexplained colony losses at other times of year, as well as concerns that the cause might be pesticide related, a study was conducted in 2001 to investigate the question, “Is imidacloprid available to honey bees foraging on clover two years after in-furrow application on potatoes in Prince Edward Island?”. Finding no link, a series of studies were initiated in Maritime Canada to investigate a wider range of crop protection products as well as other factors that could be influencing bee health. These studies included looking at apiary suitability, disease and pest incidence, beekeeping practices (including seasonal and pest management, stock improvement practices and genetics), seasonal forage availability, land use patterns, agricultural practices, and pesticide residues. Subsequently, other studies focused on specific colony stressors, and practical application of a differential diagnostic approach (factors, thresholds, and interactions). One of the focused studies involved testing various crop protection products for effects on honey bee brood.

It is clear that lethal doses of toxins will kill bees. However, how low a dose has an effect? How can the effects on brood be measured? To address these questions a study was conducted in 2004 to test field relevant doses of several crop protection products and rates under field conditions. The products used included a representative from each of the chemical families a) synthetic pyrethroid, b) insect growth regulator, c) organophosphate, and d) a chloronicotinyl. The method used was based on the semi-field ring test of Shur et al (2003). However, the study reported here differed from Shur in that it relied on direct feeding of the treatments in sugar syrup as opposed to the bees being exposed by foraging on a treated crop under a screened tent. Also, the first brood cycle of the 2004 test occurred during an intentional eight day period of confinement where the front entrance and rear ventilation opening were closed off with cluster screens. After this period the bees were allowed to free-fly and the test was continued through to the end of a second brood cycle. Preliminary results suggest that none of the field relevant doses prevented brood from developing normally. Also, no behavioral changes were noted in adult bees. Foraging, defense of the colony, care of brood, and general bee behavior were similar among treatments. However, confinement stress appeared to produce a disease outbreak. Also, there may be a link between confinement and one of the treatments.

**ROB F. SMITH AND MICHELLE LARSEN**

Atlantic Food & Horticulture Research Centre, AAFC-AAC, 32 Main Street, Kentville, NS., B4N 1J5 902-679-5762 (p)

## **Seaweed extracts..... a mysterious agent in orchard mite management.**

Foliar-applied sprays are a routine component of Nova Scotia orchard nutrient management; determination of need is typically based on leaf tissue analysis from the previous year. Annually these supplements to ground-applied fertilizers cost producers

\$75.00-300.00 per hectare; calcium applications to enhance long term storage of fruit account for 40-50% of the average 20 kg of the materials, used followed in prominence by nitrogen and boron sprays. Some products are implicated in impacting arthropod dynamics. Sea weed extracts primarily from knotted wrack, *Ascophyllum nodosum* although low in N-P-K, have an abundance of secondary plant compounds notably cytokinins and betaines. At product rates of 2-3 L/hectare applied 3-4 times during the summer, European red mite populations have consistently declined in Annapolis Valley orchards. There has been no detectable negative effect on predatory mites, primarily *T. pyri*. Laboratory dose response tests have shown no efficacy on overwintering eggs, summer eggs or motile stages of phytophagous mites.

### **JON SWEENEY**

Natural Resources Canada, Canadian Forest Service, Fredericton, NB

### **Urban forests as a gateway for invasive forest pests.**

The rate of alien species introductions to North America has increased dramatically in the last century, largely as a result of accelerated global trade. The brown spruce longhorn beetle, Asian longhorned beetle, and emerald ash borer, recently detected in Halifax, Toronto, and Windsor/Detroit, respectively, likely arrived inside wood used to pack freight in shipping containers. More than 2.2 million containers arrived at the ports of Vancouver and Montreal in 2004 alone. Regulatory agencies in Canada inspect only about 1-2% of containers, and have live pests in 3% of containers inspected. These sorts of figures make it clear why so many introductions have occurred and why many countries have recently adopted stricter phytosanitary rules about wood packaging.

Cities are high risk sites for the establishment of alien forest insects, because of the high volume of people and goods arriving from other continents, coupled with large numbers of street trees and greenbelts, often under stress from soil compaction, air pollution, and other factors. Ports are not the only high risk sites, because many containers are shipped far inland by rail and transport truck; any major construction site that brings in large volumes of heavy equipment is prone to introductions of species carried in solid wood packing material.

Some have suggested that biological traits such as high reproductive rate, broad host range, affinity with humans and their technology would be associated with a species "invasiveness" species, etc., but it is proven difficult to predict which species will become invasive based on species attributes. For example, the emerald ash borer was a virtually unknown species of almost no pest significance in China, yet it is currently devastating ash species in North America. If prevention fails, early detection of invasives is essential for their containment and potential eradication, but the latter is difficult and requires intensive, long term commitment.

REGINALD P. WEBSTER<sup>1</sup>, MARIE-ANDRÉE GIGUÈRE<sup>1</sup>, JIM EDSALL<sup>2</sup>, PATRICK MALTIAS<sup>3</sup>,  
JOCELYN ROY<sup>3</sup>, AND LEAH GALLIE<sup>3</sup>

<sup>1</sup> Charters Settlement, NB; <sup>2</sup> Moncton, NB; <sup>3</sup> University of Moncton

### **Mosquitoes of Urban Areas of New Brunswick.**

Thirty-nine species of mosquitoes were recorded from New Brunswick during a three year survey of the mosquitoes of the province funded by the NB Dept. of Epidemiology. Each of these species has a preferred larval habitat. The presence of a given species and their abundance at a given locality is dependent on the kind and size of larval habitats that are present at or near the site. Between 17 and 23 species were recorded at seven rural sites. Adult abundance was generally high with seasonal total trap catch in CDC miniature CO<sub>2</sub> light traps ranging from nearly 9000 at a site with abundant wetlands to only 228 individuals at a site with very limited wetlands nearby. Highest species richness and adult abundance was recorded at sites with the greatest diversity of wetland types. In urban sites, species richness and abundance was generally lower than that of rural sites. At four urban sites, between 13 and 21 species were recorded. Total seasonal adult abundance ranged from 120 to 1930 individuals. Highest species richness and adult abundance was recorded at sites with the greatest diversity of wetland types. However, wetlands were uncommon at most urban sites. No wetlands were located near an urban site where only 120 individuals (13 species) were recorded during the season. Although, mosquitoes are generally uncommon within urban centers, they can be abundant within parks within urban areas if wetlands are abundant. Twenty-seven species (6765 individuals) were recorded from Mapleton Park, Moncton, a site with diverse and abundant wetlands.

D.NELSON, STEVE WOODS, AND M. HUNTER

University of Maine, Orono, ME

### **An evaluation of the role of standing dead trees (snags) as a substrate for epiphytes and invertebrates.**

A study was conducted to assess the roles of snags as substrate for invertebrate communities. The study was conducted in the Holt forest in Arrowsic, ME. In 1996, the boles of 72 live and standing dead trees (36 each) were sampled by brushing invertebrates into a cup containing alcohol. Invertebrates were subsequently sorted into morphologically distinct groupings (morphs). Half of the trees in each category were red oaks and half were white pine. Each tree was characterized by its DBH and relative measures of the amount of lichen, moss, and bark roughness. The proportion of sample area that was covered by bark was also noted. There were no differences between tree species or condition (live vs dead) for DBH. The red oaks had higher amounts of moss and slightly smoother bark than the white pines. Live trees had higher amounts of lichen than did the snags. Only the snags had less than 100% bark coverage. The total number of

invertebrates on white pine snags was lower than the total the number recovered from live white pine, live red oaks or red oak snags. The latter three classes were comparable. Other variables that contributed positively to the number of invertebrates recovered included the area sampled (DBH), the proportion of bole covered with bark, and the amount of lichen on the bole. The amount of moss was not a significant factor. Mites (Acarina) and springtails (Collembola) were by far the most common taxa. Other less common taxa included bark lice (Psocoptera), true flies (Diptera), millipedes (Diplopoda) and spiders (Araneida). Most morphs either preferred red oak, or displayed no preference.

**JIANHUA ZHANG, CLAUDIA GOYER, AND YVAN PELLETIER**

Potato Research Center, Agriculture and Agri-Food Canada, 850 Lincoln Road, Fredericton, New Brunswick, E3B 4Z7, Canada

### **Cloning and sequence analysis of cytochrome P450 genes from Colorado potato beetle.**

Colorado potato beetle (*Leptinotarsa decemlineata* (Say)) is a major defoliator in potato fields. The insect has remarkable ability to develop resistance to most insecticides used to control it. Cytochrome P450s are implicated in the resistance to certain insecticides. However, none of the cytochrome P450 genes has been cloned or sequenced from Colorado potato beetles. In this study, we cloned six cytochrome P450 genes from three families using asymmetric degenerate PCR method. The gene CYP4(R6) encoded a protein of 484 amino acids. The deduced amino acid sequence showed 72% identity to CYP4G25 of Japanese oak silkmoth. Phylogenetic analysis indicated that it was in cluster of CYP4 family. The deduced sequence of CYP9(R6) had 531 amino acids, which showed 44% identity to a unclassified cytochrome P450 of honey bee and 41% identity to CYP9E1 of fruit fly. It clustered in CYP9 family. Both CYP6(R5v1) and CYP6(R5v2) had deduced sequences of 510 amino acids, which differed in two amino acids. The amino acid sequences showed over 40% identity to CYPm3r9 and CYP6N1 of African malaria mosquito. Both clustered with other members in the CYP6 family. In the same cluster were CYP6(R1v1) and CYP6(R1v2). Both cytochrome P450s had 493 amino acids with only one amino acid difference. They showed 38% and 37% sequence identity to CYP6P4 of African malaria mosquito, respectively. The low sequence identity to the other members of CYP6 family suggests that they belong to a new P450 family, but the phylogenetic analysis indicated that they clustered with the P450s of CYP6 family, thus, may be considered members of a new CYP6 subfamily. The sequence information of the P450 genes will facilitate elucidation of their roles in insecticide resistance and cloning of other P450 genes of Colorado potato beetle.

**H. ZHOU<sup>1</sup>, K. MACKENZIE<sup>2</sup>, AND D. STRONGMAN<sup>1</sup>**

<sup>1</sup> Department of Biology Saint Mary's University, Halifax NS B3H 3C3

<sup>2</sup> Agriculture and Agri-Food Canada, Kentville NS B4N 1J5

**Adult black vine weevil (*Otiorhynchus sulcatus*) damage to strawberry plants, oviposition and egg viability. (Poster)**

Black Vine Weevil, BVW (*Otiorhynchus sulcatus*), an important pest of strawberry, was evaluated for effects of three strawberry cultivars, Annapolis, Cavendish and Evangeline, on feeding damage, fecundity and egg viability. There was no significant difference in leaf consumption at an initial weevil density of 32 weevils/plant while at a lower initial density (16 weevils/plant) less leaf was consumed for 'Cavendish' than the other two cultivars over a 27-day feeding period. Individual oviposition, over a 21 weeks and 37 weevils, ranged from 86 to 909 eggs with 'Annapolis'-fed weevils laying more eggs than those feeding on the other two cultivars. While egg viability of groups of 50 weevils was similar (~90% hatched) for the three cultivars, egg hatch from individual weevils was on 'Cavendish'  $31 \pm 30$  %, 'Annapolis'  $51 \pm 35$  %, and 'Evangeline' intermediate  $42 \pm 36$  %. These results indicate that strawberry cultivars do influence BVW success.

---

**Acadian Entomological Society 65<sup>th</sup> Annual Meeting  
Lord Beaverbrook Hotel, Fredericton, NB June 19-21, 2005**

**Minutes of the Annual General Meeting**

The meeting was called to order at 1630 h by President Jon Sweeney with 17 members present.

**1. Approval of Agenda**

Moved by Kenna MacKenzie and seconded by Donna Giberson to accept the agenda with one addition under New Business, i.e., a discussion on a poster prize. Motion carried.

**2. Minutes of the 64<sup>th</sup> Annual General Meeting**

Moved by Yvan Pelletier and seconded by Andrei Alyokhin to approve the minutes. Motion carried.

**3. Business Arising from Minutes**

There was no business arising from the minutes.

**4. President's Report**

Jon Sweeney presented the President's report. He reported that the AES membership consisted of 35 regular and 10 students. He also thanked Reggie Webster for leading the collecting trip at Odell Park. Ten collectors participated in this event.

**5. Treasurer's Report**

Secretary/Treasurer Don Ostaff presented the status of the AES account. Moved by Don Ostaff and seconded by Dan Quiring to accept the Treasurer's report. Motion carried.

## **6. Journal Editor's Report**

Editor Don Ostaff presented the Journal report. To date 4 manuscripts have been received. Two manuscripts were rejected by reviewers, one was accepted as a Note, and one is with reviewers.

## **7. New Business**

### **a. Distribution of funds from the 2004 Joint Annual ESC/AES Meeting**

After much discussion it was moved by Donna Giberson and seconded by Andrei Alyokhin that profits from the Joint Annual Meeting be split 70/30 with 70% retained by AES to conduct its business and 30% contributed to the ESC Scholarship Fund. Motion carried with 1 opposed.

### **b. Nomination and Election of New AES Executive**

Kenna MacKenzie and Michelle Larsen were nominated for the positions of President and Vice-President, respectively. Both accepted the nomination.

Moved by Dan Quiring and seconded by Yvan Pelletier to accept Kenna and Michelle as the new President and Vice-President. Motion carried.

***ACTION:*** The new executive will identify a new Secretary/Treasurer.

### **c. Time and Place of 2006 AES Annual Meeting**

***ACTION:*** The new executive will determine a suitable time and location for the 66<sup>th</sup> Annual Meeting.

### **d. Other Business**

#### ***i. Poster Prize***

Most members present felt that a Poster Prize should be awarded to encourage additional participation at the AES meetings, particularly by students.

***ACTION:*** The new executive will decide whether or not to offer a Poster Prize at the 66<sup>th</sup> Annual Meeting

#### ***ii. AES Newsletter***

There was a discussion on the need for a section of our website devoted to Regular and Student News. Our website contains a link to NEWS. This could be expanded to provide a vehicle for a Student Newsletter and a Regular Member Newsletter. The former could provide information on present graduate students (University, degree, supervisor(s) and a brief description of thesis; lab profile, etc.). The latter could provide a forum for new insect records, hosts and distribution as well as information on awards, retirements, etc.

***ACTION:*** Kenna MacKenzie to find a student to look after the Student News section.

#### ***iii. AES Investments***

Two items were discussed: a) Should the GIC's reside in one location or move with the change of Secretary/Treasurer? b) Establishment of an Endowment Fund for students.

Moved by Kenna MacKenzie and seconded by Dan Quiring that Christine Norhona, Don Ostaff (outgoing Secretary/Treasurer) and the in-coming Secretary/Treasurer discuss and investigate the re-investment of present GIC's and additional funds in the AES account. Motion carried.

Moved by Kenna MacKenzie and seconded by Michelle Larsen that Donna Giberson and Don Ostaff investigate the ways and means of establishing an Endowment Fund. Motion carried.

*iv. ESC Strategic Review*

Dan Quiring, incoming ESC President encouraged AES members to submit any ideas for long-term strategic initiatives.

**8. Adjournment**

The meeting was adjourned at 1740 h following a motion by Donna Giberson, seconded by Dick Rogers.

Respectfully submitted

Don Ostaff  
Secretary/Treasurer