Pesticulars
The Professional Pest Management Association of B.C.

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## Past President's Message

***Todd Kabaluk***

I recommend to any of you working in pest management to seek involvement in the PPMA either through membership or service on the Executive. I was fulfilled during my term as President for two reasons: i) having the opportunity to be more closely involved with those in my own profession – *i.e.*, all of you – and gain a real appreciation of the strength and diversity of this profession in BC; and ii) offer my own thoughts and efforts in contribution to its development. I thank the members of the Executive: both the new members for their new ideas and perspectives, and the senior members for maintaining the corporate knowledge and traditions of the organization.

This years' PPMA Symposium, themed 'The Evolving Pest', featured themed talks in the morning session were right on topic, and included preambles by the speakers on evolutionary theory. The afternoon session included a mix of themed talks and those representing the diversity of activities, both research oriented and applied, of pest management in BC. Feedback from the Symposium was overwhelmingly positive and I thank all the speakers for their time and effort in the preparation of first-class presentations, and also for taking the time to travel to the meeting. I'd also like to thank Robert McGregor and Victoria Brookes for moderating the sessions. Abstracts of the talks are in this issue of *Pesticulars*.

For her long and outstanding career in a range of academic pursuits in pest management, Judith Myers, University of British Columbia, received the Lifetime Achievement Award, and thus became an Honorary Member of the PPMA. Regine Gries, Simon Fraser University, received the Contech Award in recognition of her innovative contributions to pest management research and breadth of talents in lab management. Both Judy's and Regine's names were readily suggested as candidates for these awards, and with very little discussion the Executive agreed that they would be this year's recipients. Alida Janmaat presented the award to Judy. Alida was a graduate student of Judy's and is now Professor at the University of the Fraser Valley. John Borden presented the Contech Award to Regine. John is a former SFU Professor, and currently Chief Scientist at Contech Ltd.

I'd also like to congratulate Chandra Moffat, the winner of the student prize for her excellent presentation entitled 'Impacts of plant nitrogen on the host-parasitoid population dynamics of *Myzus persicae* and *Aphidius matricariae*'

Finally, I'd like to welcome new members to the PPMA Executive: Victoria Brookes (President), Debbie Henderson (Vice President), Markus Clodius (Membership Director), and Chelsea Eby (Student Representative).

## *In memoriam*

**Jack Colburn Arrand**
May 8, 1923 – November 4, 2008

BSc (1949), MSc (1952)
PPMABC Honourary Member 1990
PheroTech Award of Excellence 1987

It is with great sadness that we announce the passing of Jack Arrand last November. Jack was twice honoured by the PPMA, receiving the PheroTech Award of Excellence in 1987 and an Honourary Membership in 1990. In the letters that were submitted in support of his nomination for the Award of Excellence his nominators commented that Jack was "highly regarded by colleagues in the provincial, federal government as well as by associates in BC Universities and the agricultural industry". That Jack set the "highest standard of excellence as a professional" and he has "inspired, motivated or guided [with] his knowledge and experience". He was "strong and consistent [in his] leadership and support for the development and adoption of pest management in British Columbia crop protection". One nominator stated, "Jack Arrand's leadership and support has been a most important factor in the development and promotion of pest management to its present healthy status in the Province of British Columbia".

Jack began his entomological career working as a summer student with the Dominion Entomological Laboratory in Saskatoon (1948), under the guidance of H.A. McMahon, on the biology and control of alfalfa insect pests. After the completion of his BSc (Sask. 1949), Jack accepted a full time position with the Dominion Laboratory. In 1957 Jack moved to British Columbia and into the position of Provincial Assistant Entomologist in Vernon, BC. Jack worked on the control of *Lygus* bugs and discovered a new species of bud-blasting mirid, *Plagiognathus medicagus*.

In Jack's thirty-year career with the BC Ministry of Agriculture and Fisheries, he was involved in extension entomology and co-authored a number of key publications for IPM programs in apple orchards, greenhouse vegetables, honeybee pollination in orchards and winter moth biological control. The City of Victoria recognized his work on winter moth with an Honourary Citizen Award. In addition to his contributions in extension, Jack made a significant impact with his skills as an administrator. He held a number of positions, Assistant Head, Entomology Branch (1957-1974); Project Analyst, BCMAF (1974-1977); Assistant Director, Entomology-Plant Pathology Branch (1977-1981); and retired as Director, Crop Protection Branch (1981-1987).

Jack served as President of the Entomological Society of BC in 1966.

## 2009 AGM and Symposium

This year's PPMABC Symposium and Annual General Meeting was held at the Halpern Centre at SFU.

***Election Results***

Also at this year's AGM, candidates for positions on our executive were elected or appointed. A big 'thank you' to our outgoing executives as we welcome our new executive committee.

**President:** Victoria Brookes

An Agricultural Sciences graduate from UBC, who began working with Agriculture and Agri-Food Canada in Agassiz as a summer student in 1973 and has been on regular staff since 1977. Presently involved with the Pesticide Reduced Risk and Minor Use Program and work with a variety of projects in the vegetable, fruit, nursery and greenhouse industries primarily concerning insects, diseases and weeds. This involves cooperation with commodity group representatives and researchers across Canada and also with the IR-4 Minor Use Program in the U.S.

**Vice President:** Deborah Henderson

Currently the Director and Leading Edge Endowment Fund Innovation Chair at the Institute for Sustainable Horticulture at Kwantlen Polytechnic University, Deb started her career in agriculture in BC in 1988 when she founded E.S. Cropconsult Ltd. to offer IPM and research services to vegetable and berry growers in SW BC. She developed an active research programme at the company involving biological and non-chemical management strategies for pests and diseases. Building on this background, she is developing, at the Institute, a research program in new microbial biocontrol products, and constructing new lab and greenhouse facilities supported by grants from Canada Foundation for Innovation and the BC Knowledge Development Fund. Other research foci of the Institute include alternate energy systems for geothermal greenhouses, and new cropping systems for both field and greenhouse.

**Past President:** Todd Kabaluk

Research Biologist at Agriculture and Agri-Food Canada in Agassiz. He is currently experimenting with microbial controls of agricultural insect pests. Other activities include biopesticide registration and regulation, and insect sampling statistics and population dynamics using data acquired from pest monitoring companies.

**Treasurer:** Tammy McMullan

Currently a Senior Lecturer at SFU: since 1988, Tammy has taught a wide range of courses, including graduate-level field courses in pest management. Tammy has held numerous Research Assistant positions, been involved in several research projects on a wide variety of insect pests, served as Director of the BC Entomological Society, and has previously held the positions of Secretary and Student Representative.

**Secretary:** Wim van Herk

Recently completed his PhD in behavioural ecology and pest management at SFU, under supervision of Bernie Roitberg, Bob Vernon (of AAFC) and Gerhard Gries. He is currently employed as a post-doc in Bob Vernon's lab (PARC, Agassiz), where he continues to work on wireworm-related projects that arose from his thesis research. He is also responsible for identifying wireworms collected from across Canada.

**Membership Director:** Markus Clodius

Originally studied botany at UVic, and was converted to entomology while completing his MPM at SFU under Gerhard Gries and John Borden. He started working for the City of Port Coquitlam monitoring mosquito populations, then moved to PARC Summerland to work as Howard Thistlewood's technician in codling moth and cherry fruit fly research. He is now part of Bob Vernon's lab at PARC Agassiz, studying wireworms and cabbage root maggot.

**Student Representative:** Chelsea Eby

Completed her BSc in Victoria while working co-op jobs in the field of insect pest management. Following graduation, she continued to work in the pest management field in BC and in England and is currently enrolled in the MPM program at SFU working on Apple Clearwing Moth, a new pest in BC's apple industry.

**Pesticulars Editor:** Alex Chubaty

Working toward his PhD under the supervision of Dr. Bernie Roitberg (SFU) and Dr. Chao Li (Northern Forestry Centre, Edmonton, AB), investigating the role of body condition on host-selection behaviour of mountain pine beetle.

***Abstracts***

**Influence of local and long-distance dispersal on the evolution of *Bt* resistance in cabbage looper populations**
*Michelle T. Franklin and Judith H. Myers*

Use of *Bt* products in vegetable greenhouses has been threatened by the evolution of resistance in *Trichoplusia ni*. Patterns of *Bt* resistance and molecular analysis indicate that moths disperse between neighbouring greenhouses and result in the spread of resistance to untreated greenhouses. Susceptible long-range migrants have the potential to dilute resistance, however molecular analysis suggests that moths from overwintering greenhouse populations frequently colonize surrounding greenhouses and fields.

**Host-adapted parasitoids in biological control: does source matter?**
*Lee Henry*

It has been hypothesized that the success of a biological control agent is dependent on its ability to become locally adapted to its new environment or population of hosts. Despite this, few studies have investigated the influence of the recent co-evolutionary history of pest species and natural enemies on the efficacy of biological control agents, especially for agents that are mass-reared for release in agriculture. The evolutionary potential of biological control agents is reviewed, highlighted by work on *Aphidius parasitoids* and their ability to adapt to key pest species. The potential to improve natural enemies efficacy is discussed through the application of novel collection and rearing techniques designed to increase the quality of biological control agents through the development of host-adapted lines of natural enemies.

**Gut bacterial communities in the Mediterranean fruit fly (*Ceratitis capitata)* (medfly) and their impact on host fitness**
*Adi Behar, Ben-Ami Eyal, Jurkevitch Edouard, Yuval Boaz*

The medfly, is a pest causing billions of dollars worth of damage worldwide. Control efforts have focused on the Sterile Insect Technique (SIT), by releasing large quantities of radiation-sterilized male flies that compete for mating with wild male. However, these flies are poor competitors. Our results present a tool of great potential for improving the sterile insect technique.

**Forest insects in a changing environment: Same rules, different field**
*B. Staffan Lindgren and Kenneth F. Raffa*

Western North America is currently experiencing "hyper-epidemic" mountain pine beetle populations, with associated range expansion, non-host attacks, and extensive mortality in young pine. This has led to widespread speculation, particularly in the media, that beetles are evolving rapidly. We discuss this possibility in the context of what is known about bark beetle - host tree interactions.

**Biological control of the European Chafer (*Rhizotrogus majalis)* in turfgrass**
*Carolyn Teasdale, Deborah Henderson, Renee Prasad, Christine Ensing, Claude LeDoux, Yota Hatziantoniou, Dipak Datani*

The entomopathogenic nematode, *Heterorhabditis bacteriophora*, was tested against first, second, and third instar European chafer. First instar chafer larvae had significantly higher relative mortality than third instar chafer larvae.

**Influence of cone monoterpenes on clonal preferences of the western conifer seed insect in a lodgepole pine seed orchard**
*Tamara Richardson, Ward Strong, B. Staffan Lindgren*

The western conifer seed bugs exhibits preferences for specific clones in lodgepole pine seed orchards. We sampled cone terpenes from clones favoured by the western conifer seed insect and those were not. We found evidence of differences in terpene content of favoured and unfavoured clones.

**The use of fungi to manage Bt resistance in cabbage loopers**
*Jerry Ericsson, Alida Janmaat, Judith Myers, Mark Goettel, Todd Kabaluk, Carl Lowenberger*

There is an increasing amount of evidence suggesting that the evolution of resistance to Bt results in an increased susceptibility to other pathogens. We are currently testing several fungal biopesticides to determine if they can be used to control cabbage loopers when Bt is not effective, and when a biological insecticide is desired.

**Impacts of plant nitrogen on the host-parasitoid population dynamics of *Myzus persicae* and *Aphidius matricariae***
*Chandra Moffat and Dave Gillespie*

The impacts of nitrogen fertilizer on habitat quality and tri-trophic interactions were examined utilizing the study system of the bell pepper, *Capsicum annuum*, its aphid pest *Myzus persicae* and the parasitoid wasp

*Aphidius matricariae*. Three different rates of nitrogen (N) fertilizer were tested in a stationary hydroponics system: a control rate of 200 ppm N, a ten percent N rate of 20 ppm and a two hundred percent rate of 400 ppm. Peppers were started from seed in a soil medium and then grown in a soil-less nutrient solution from 28-60 days of age. Adult aphids were introduced at 45 days of age, left to reproduce pathogenically for four days and then removed. All juvenile aphids were counted and a single female parasitoid introduced to the closed plant-aphid system. Ten days from parasitoid introduction, the number of aphids and mummies formed were counted. The aphids will be measured as a proxy for host quality and fitness potential. The emerged parasitoids will be measured and sex ratios have been compiled. Preliminary results indicate aphids reared on the low N (20ppm) plants were smaller in size and had lower population growth rates (PGR), while aphids on the high N plants (400 ppm) were larger and had higher PGR. Parasitoids emerged earlier, were of a smaller size, and had a larger proportion of females in the 20ppm treatment and those produced from the 400ppm treatment were larger, slower to emerge, and were biased towards males.

**Globalization in mass production of biocontrol products with special reference to green lacewing**
*Abida Nasreen*

Effect of quantities of prey eggs and number of predator eggs was evaluated on efficiency and economics of *C. carnea* production system on per unit basis in low-wage and high-wage countries. Efficiency of the unit increased and the value of the unit decreased with the increase in biological inputs. Production cost of a unit was found very high ($ 0.1) in developed country (Canada) than ($ 0.02) in underdeveloped country (Pakistan). Labour cost was found the biggest part of the production unit as it was $0.015 and $0.004 per unit in developed and under developed countries.

**The role of agricultural consultants in IPM delivery: A view from the farm**
*Renee Prasad*

E.S. Cropconsult has been providing IPM services to growers for more than 20 years. We monitor arthropods and diseases in vegetable and berry crops. An overview of our IPM services will be discussed along with some of the challenges encountered in the delivery of IPM. Increasingly we find ourselves participating in research, to help growers address pest management issues using new tools and techniques. Highlights of past and current research will be covered along with some of the challenges of conducting on-farm applied research.

***Awards***

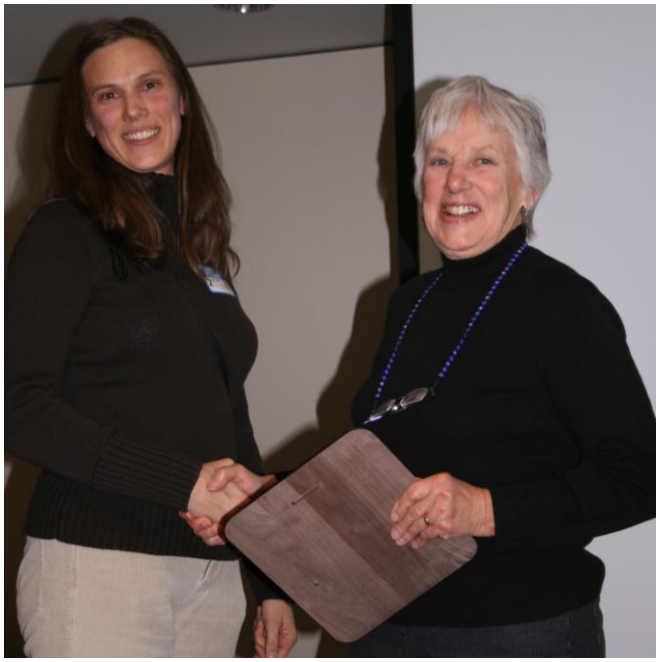
This year's recipient of the ***ConTech Award*** (formerly the PheroTech Award) was Regine Gries, presented by John Borden of ConTech.

Alida Janmaat, from University of the Fraser Valley, presented this year's ***Honorary Lifetime Achievement Award*** to Judy Myers.

Chandra Moffat won the Student Award for her presentation entitled "Impacts of plant nitrogen on the host-parasitoid population dynamics of *Myzus persicae* and *Aphidius matricariae*".

**John Borden (left) presents the Contech Award to Regine Gries (right).**

**Victoria Brookes (left) congratulates this year's Student Award winner Chandra Moffat (right).**



**Alida Janmaat (left) presents this year's Honorary Lifetime Achievement Award to Judy Myers (right).**

***AGM Sponsors***

Thank you to our sponsors for this year's AGM:

**Novozymes**
**Koppert**

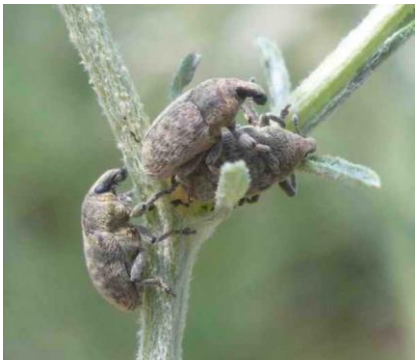
We are looking for companies interested in sponsoring a coffee break or lunch at next year's Symposium in return for advertising space. Coffee with muffins costs $200 and lunch costs $1000. If interested, please contact Victoria Brookes (ppmabc@sfu.ca).

## Featured Lab: Judy Myers, UBC

***Judy Myers***
*University of British Columbia*

My joint appointment between the Department of Zoology and the Faculty of Land and Food Systems at UBC results in the best of both worlds; a lab in the Horticulture Greenhouse and offices in the brand new Centre for Biodiversity Research.

Two long-term projects continue in the lab; population cycles of western tent caterpillars and biological control of diffuse knapweed. Both of these studies began in the mid-1970s and monitoring continues to this day. For the tent caterpillars we have studied how a viral disease, nucleopolyhedrovirus waxes and wanes with tent caterpillar densities. This summer we ran an experiment to determine if food shortage could produce maternal effects in the form of reduced fecundity that might also contribute to the cyclic population dynamics. Jenny Cory and Jerry Ericsson from SFU are collaborators in this project as well as NSERC post-doc Michelle Tseng.



***Larinus minutus* on knapweed.**

Knapweed appears to finally have come under control in many areas of the BC Interior following the successful introduction of a weevil, *Larinus minutus* in the late 1990s. The decline in knapweed is a real joy to those of us who remember what densities were like previously. Now students Andrea Stephens and Tom Deane are studying what happens to the plant community following the decline of knapweed and how several of the introduced biological control agents interact.

Amanda Brown defended her MSc last November based on her study of rosy apple aphids in organic orchards in the Cawston area. She studied the interactions between the aphids and their alternate food plant, plantain.

Michelle Franklin is finishing her PhD work on the population structure of cabbage loopers among green houses and along the migration route from California

where they overwinter. Loopers are genetically similar from California to BC but in some areas such as Langley it appears that looper populations originating from overwintering greenhouses are genetically different from those along the coast in California and Oregon.

**Michelle Franklin and Jerry Ericsson (left); Amanda Brown and Andrea Stephens (right)**

Several nationalities are represented in the lab; Tom is from England, Andrea from New Zealand, and we have just welcomed a new post-doc Rana Sarfraz who originates from Pakistan but recently completed his PhD at University of Alberta. All of us are interested in both basic and applied ecology and evolution as related to insects and plants. The diversity of the projects we are undertaking makes lab meetings interesting. We hope that are results lead to useful recommendations for growers as well as contributing to a better understanding of patterns and processes in insect ecology.

*If you would like to recommend a lab for feature in* Pesticulars*, we welcome suggestions for future issues. Please contact Alex Chubaty (ppmabc@sfu.ca).*

## Endnotes

### ***Upcoming Meetings and Events***

- Canadian Phytopathological Society
  *22-25 June 2009, Winnipeg, MB*
  http://www.cps-scp.ca/meetings.shtml
- Entomological Society of Canada
  *18-21 October 2009, Winnipeg, MB*
  http://home.cc.umanitoba.ca/~fieldspg/ESC2009_files/
- Pestworld Convention and Exhibition
  *26-29 October 2009, Las Vegas, NV*
  http://www.npmapestworld.org/events/PestWorld2009/
- Canadian Weed Science Society
  *24-26 November 2009, Charlottetown, PEI*
  http://www.weedscience.ca/events

### ***Electronic Publishing***

*Pesticulars* is now an electronic publication. To ensure that you receive your copy, please send us an updated email address. Email addresses and mailing information (for ballots and voting information) can be sent to Nadene Sawyer (ppmabc@sfu.ca).

### ***Website***

Our website address is www.sfu.ca/~ppmabc/. Check it out for information on our association, contact details, copies of *Pesticulars*, and upcoming events.
*Webmaster*: Alex Chubaty (achubaty@sfu.ca).

### ***Pesticulars Submissions***

We are always looking for pest management topics to publish. If you or know of others who have information to relay, exciting research to share, or upcoming events that you would like posted in one of our issues, please contact Alex Chubaty (achubaty@sfu.ca).