



Entomological Society of Saskatchewan

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DECEMBER 2014

ESS gets “JAMmed” in 2014

SPECIAL POINTS OF INTEREST:

- THE ESS HOSTS THE ESS-ESC JAM 2014
- HERITAGE LECTURE ON THE HISTORY OF THE DOMINION ENTOMOLOGICAL LABORATORY
- NOTEWORTHY RECORDS OF ORTHOPTEROID AND HEMIPTEROID INSECTS FROM SW SK AND SE AB
- YOUTH AND AMATEUR ENCOURAGEMENT ACTIVITIES
- REMEMBERING PETER HARRIS
- RAISING MANTIDS
- TROUTREACH TAKES PART IN THE NATURE CITY FESTIVAL
- SUMMER STUDENT JOB POSTING



Owen Olfert gives the Heritage lecture at ESC JAM 2014 .

presented the Heritage lecture on the history of the Dominion Entomological Laboratory (now absorbed into the Saskatoon Research Centre) in his, limited edition, Owen designed, Dominion Entomological Laboratory t-shirt (available for pre-order only in unbleached, natural cotton...just like the old entomologists would have worn). The ESS president, Dave Halstead, presented the Criddle award for amateur entomology to local collector Brian Olson at the Tuesday night banquet. The local improv-comedy troupe, The Saskatoon “Insecticidal” Soaps performed for the entomology crowd and Barb Sharanowski of the University of Manitoba (and still ESS member) initiated the

Perhaps you hadn’t heard or perhaps you had forgotten (in either case, you need to be a more active ESS member) that the Entomological Society of Saskatchewan hosted the 2014 Entomological Society of Canada Joint Annual Meeting at the Radisson Hotel on the banks of the South Saskatchewan River in Saskatoon from 28 September to 1 October. The meeting theme was “Entomology in a changing world” and the logo by Leila Benmerrouche depicted that element of change with the world as a chrysalis. The conference was well attended with nearly 200 registrants. Sixty of the registrants were students which seems to be a larger percentage of the participants than at previous meetings. Of special note; the ESS’s own Owen Olfert

first improv-comedy keg stand with local weather and funny-man Jeff Rogstad . The local organizing chairs Owen Olfert, Julie Soroka and Chrystal Olivier finally got to relax with a drink at the banquet. The meeting was run smoothly from “The Situation Room” where Dwayne Hegedus (Treasurer) and numerous student volunteers/Sask Canola Council scholarship recipients loaded PowerPoint presentations into their proper rooms and took registration money from registration stragglers. Cedric Gillott, (Scientific committee member co-chair) dropped in to the situation room and admits that he might have had to make a few changes to the scientific program. Several of our ESS





Left: Brian Olson receives the Criddle award from ESS president David Halstead at JAM 2014

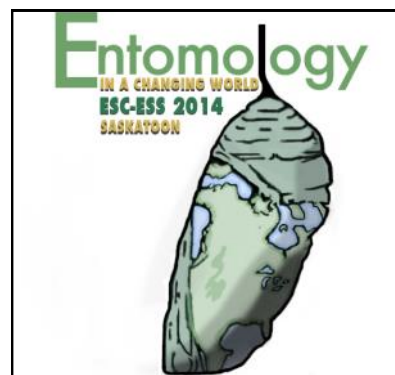
Below: Sharanowski initiates the Kegstand...Jeff Rogstad happily obliges



(Continued from page 1)

members moderated sessions including Tyler Wist who, along with Sarah Loboda of McGill University, ran the Graduate Student Showcase on the opening day and Jeff Boone, City of Saskatoon, ran the Urban Forestry Entomology Symposium.

A select group of ESS members orchestrated the meeting over the preceding year (see below for a photo of our Chairpersons). Thanks also to Jeff Boone for keeping the meeting out of the red (just barely) by securing corporate sponsorship from many generous donors (see facing page). Watch for more pictures of the 2014 JAM appearing soon on the ESS website.



The local organizing chairs Chrystel Olivier, Owen Olfert and Julie Soroka enjoying their meal at the banquet.





Wist and Loboda moderating the GSS

2014 JAM Organizing Committee

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Julie Soroka

Chrystel Olivier

Treasurer/Registration

Dwayne Hegedus

Local Arrangements

Accommodations

Keith Moore

Wayne Goerzen

Audio-visual Displays

Doug Baldwin

Wayne Goerzen

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Recipients of ESS SaskCanola Volunteer awards

The Entomological Thread of Federal Agricultural Research: Saskatoon 1918-2014



Figure 1. "Horse and Pole Duster". Dr Arni Arnason using arsenic powder to control bertha armyworm in 1928 Photo: Harding 1986.

Introduction

Entomology has been a feature of federal agricultural research in Saskatchewan for nearly 100 years. Thanks to the Riegert family, the University of Saskatchewan Archives has a very comprehensive collection of entomological heritage publications, notes and photographs for western Canada that were compiled by Paul Riegert. I was aware of many of Paul's historical publications over the years, but it was awe-inspiring to see the extent of his records and files. A complete listing of the university holdings of Paul's archives can be found on the Entomological Society of Saskatchewan website.

After several visits to the university archives, I came to the realization that, at best, I could update just one 'thread' of the entomological fabric that Paul had so thoroughly assembled over the years. The publication *A History of the Dominion Entomological Laboratory in Saskatoon, SK* (Riegert 1995) caught my attention when I realized that I had actually met several of the original staff members of the Dominion Entomological Laboratory (DEL) during my tenure as an undergraduate student working at the Canada Agriculture Research Station (CARS) in the 1970s. I was captivated. Hence, I made the decision to begin my presentation with the DEL – Saskatoon, and to follow the entomological

thread of agricultural research through CARS (where my career began) and over to the Saskatoon Research Centre (SRC), currently a research facility of the Science and Technology Branch of Agriculture and Agri-Food Canada.

Dominion Entomological Laboratory

The development of federal government agricultural research began with the establishment of select Experimental Farms under the direction of William Saunders in 1885. By the early 1900s, the demand for entomological expertise within the Prairie Ecozone increased with expanded settlement, in part due to the large-scale disturbance of native prairie soils that influenced the pest status of some indigenous insect populations. In 1913, Norman Criddle was appointed as the entomological officer in Manitoba and Edgar Strickland in Alberta. But it wasn't until 1918 that Dr Alfred Cameron received a joint appointment between the Government of Canada and the University of Saskatchewan, and the Dominion Entomological Laboratory– Saskatoon was founded (Harding 1986). The government did not own any buildings on campus at the time, so the DEL was co-located at the University of Saskatchewan in the basement of the Field Husbandry Building.

Dr Cameron arrived in Saskatoon as the first Officer-in-Charge, with the intent of studying indigenous blackflies (*Simulium* spp.). However, a major grasshopper outbreak in the province demanded his

attention and early DEL staff were immediately caught up in monitoring and controlling this major pest of field crops. Dr Cameron left the DEL to return to studying biting flies after only 2 years, and was replaced by Dr Kenneth King. It was Dr King who really established the DEL as a centre of excellence in insect ecology (Harding 1986). Although grasshoppers dominated for years as agriculture continued to expand, an array of insect pests surfaced including Hessian fly, bertha armyworm, wireworms and cutworms. As a result, the DEL increased its staff of officers to seven by the early 1930s. Research activities at the DEL were severely disrupted in the early 1940s due to the Second World War. However, the unit was re-invigorated soon after and had a staff of 25 (including officers and technical staff) by 1950. The range of entomological expertise had also expanded and included taxonomy, biology, life history studies, and control options. In addition to grasshoppers, cutworms and wireworms, wheat stem sawfly had become a major issue as well.

The major issues addressed by the newly-established DEL related to pest control, insect ecology, monitoring and forecasting. Control methods were very limited. As a result, early researchers had a mandate to develop control options – cultural, poison baits, etc. For example, Dr Arni Arnason utilized his resources on hand and designed a control method using bags of arsenic powder and horses to control bertha armyworm in 1928 (Figure 1)

Since Paul had already thoroughly reviewed early pest control tactics in “From Arsenic to DDT” (Riegert 1968), I decided to focus on the other major initiatives, namely insect ecology, monitoring and forecasting for this presentation. Given the

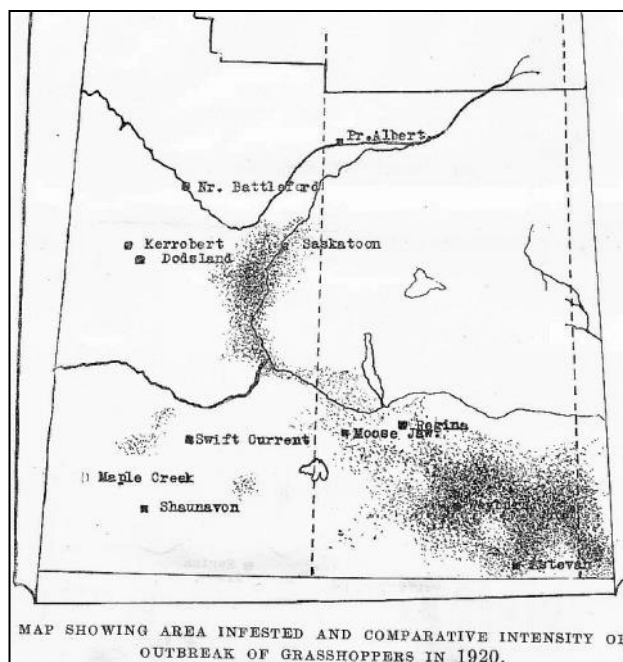


Figure 2. Map showing survey locations of grasshopper distribution in Saskatchewan in 1920.

Source: University of Saskatchewan Archives .

urgency of the grasshopper threats to early agriculture, it seemed fitting to begin with grasshoppers (*Melanoplus* spp.; *Camnula pellucida*) as my example of insect monitoring and forecasting during the DEL era. The earliest reference to a grasshopper forecast map was published in 1920 (Figure 2).

1933-34 EMERGENT PROGRAM FOR DESTROYING GRASSHOPPERS

ENORMOUS NUMBERS OF GRASSHOPPER EGGS have been laid throughout stubble fields and along roadsides.

A very severe outbreak next spring seems certain. The pest **CAN BE CONTROLLED** effectively and cheaply by general adherence to a sound plan of tillage and poisoning.

THE ESSENCE OF THE PLAN

- SEED EARLY AND ONLY ON: FALLOW**—(It is free from eggs); OR
SPRING OR FALL PLOWING—(mold-board plowing 5" deep buries eggs so that young hoppers cannot emerge)
- PROTECT CROPS AGAINST INVASION** from nearby stubble fields and roadsides, by proper tillage and poisoning.
- AVOID** (a) ANY SEEDING ON HEAVILY INFESTED STUBBLE UNLESS PLOWED. (b) LATE SEEDING OF ANY KIND.


WHAT TO DO BEFORE WINTER

- PLOW GUARD STRIPS NOW** around all fields intended for fallow in 1934. If you can do nothing else this fall, do all you can in this direction.
- Where conditions permit, **FALL PLOW** as much as possible of the stubble land that is to be seeded next spring.
- Fall rye may be seeded for spring pasture and hay.
- In discplow soil, if plowing is not feasible, **VERY SHALLOW** tillage this fall and again **VERY EARLY** next spring may be used to somewhat reduce the infestation. With mold-board-plow soil, or heavy infestation on any soil, this treatment **WILL NOT MAKE STUBBLE FIELDS SAFE** for SEEDING.

Fields Cannot Successfully Produce Both Grain and Grasshoppers.
DO YOUR PART AND SUPPORT THE CAMPAIGN

KILL GRASSHOPPERS

Crops can be Saved
•
HOPPERS CAN BE CONTROLLED
•



FOUR POINTS OF SPRING AND SUMMER CONTROL

- Summerfallow Heavily Infested Stubble**
Seedling infested stubble usually means a lost crop and lost time trying to save it.
(See diagram on back page)
- Leave Guard and Trap Strips on Summerfallow and Poison Trap Strips**
ALL 1933 summerfallow in the infested area should be treated this way. Work the Guard Strip around your summerfallow outlay.
REMEMBER
1. Hoppers will probably not have hatched when summerfallowing starts; but trap strip anyway on that hoppers will gather on strips and may be killed.
2. Five hoppers on a square foot may be hard to see, but that would be about One-Quarter Million Hoppers per Acre. Keep them on the fallow with a Guard Strip, let them gather on Trap Strips and kill them. Don't let them away to crop heads and lay eggs.
3. Guard and Trap Strips should be at least 2 rods—32 feet wide.
- Kill Hoppers on Roadsides, Pastures and on Summerfallow Trap Strips and Field Margins**
Watch for Hatching and Poison Early before Hoppers Spread Through Crops
1. Spread poisoned bait among young hoppers.
SPREAD IT THINLY—3 GALLONS PER ACRE
SPREAD IT EARLY ON WARM, WINDY MORNINGS
2. If there is good ground to carry the spray, use spray of CHLORDANE.
SPRAY CHLORDANE AT 1 LB. PER ACRE
DO NOT SPRAY UNTIL IT IS HOT AND WINDY
SPRAYING IN EARLY MORNING OR EVENING IS RECOMMENDED
3. Poisoned baits kill best where vegetation is sparse and dry.
4. Sprays kill best where vegetation is tall and rank.

4. Repeat baiting or spraying every 4 to 7 days as required
USE BAIT SPREADERS FOR POISONED BAIT
**DON'T LET YOUR NEIGHBOUR DOWN
DO YOUR PART IN THE CAMPAIGN IN YOUR DISTRICT**

For further information see your Agricultural Representative, Agricultural Committee-man, or write the Dominion Entomological Laboratory, Saskatoon, or the Field Crops Branch, Saskatchewan Department of Agriculture, Regina, Saskatchewan.

Figure 3. Posters advocating grasshopper population control in Saskatchewan in 1933 and 1949
Source: AAFC-Saskatoon Research Centre.

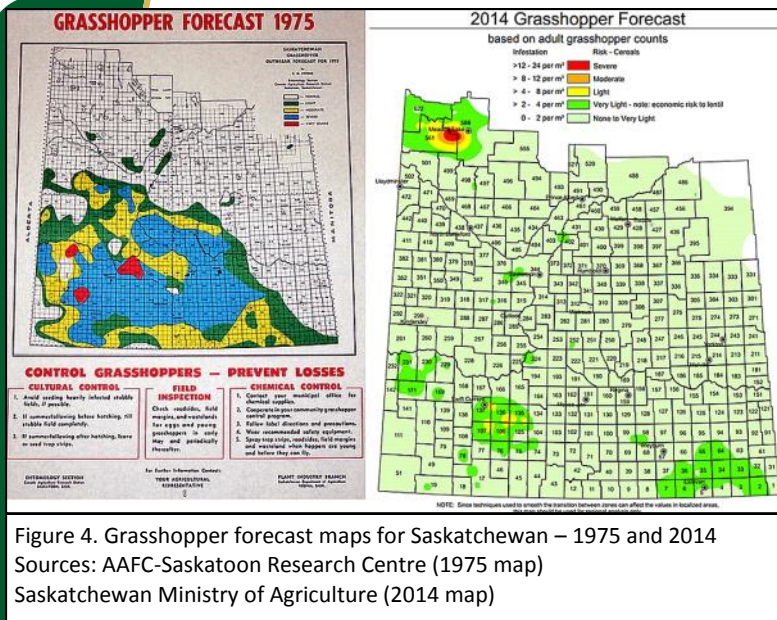


Figure 4. Grasshopper forecast maps for Saskatchewan – 1975 and 2014
Sources: AAFC-Saskatoon Research Centre (1975 map)
Saskatchewan Ministry of Agriculture (2014 map)

(Continued from page 5)

In support of the annual grasshopper campaigns, contoured forecast maps were meticulously hand drawn up until 1980 by data analysts with drafting expertise (Figure 4). Following the retirement of the data analysts/sketch artists, population data were averaged over rural municipalities for the next 10 years or so until GIS mapping tools became readily available in the 1990s. In summary, field survey data of Saskatchewan grasshopper populations date back to 1920, and are continued today, making it a world class record of annual insect population distribution and density.

Canada Agriculture Research Station

A new government laboratory was constructed on the University of Saskatchewan campus in the mid-1950s, allowing for a consolidation of the federal agriculture 'Science Service' staff. In 1959, the Dominion Laboratories of Entomology, Plant Pathology and Forage Crops were combined forming the new Canada Agriculture Research Station (CARS). Largely due to pressure from lead farm groups, entomology continued to flourish in Saskatoon (Anstey 1986). By the 1960s, CARS had a staff of 20 entomologists with a broad range of scientific expertise. They included:

Grasshoppers: Howard MacDonald – chemical control; Paul Riegert and Roy Pickford – ecology; Robert Randell – population demography

Forage crop insects: Harold McMahon and Harvey Craig – control

Rapeseed insects: Lloyd Putnam – control; Larry Burgess – ecology

Medical entomology: John McClintock and Raymond Bellamy – Western Equine Encephalitis.

Biting flies: Hartley Fredeen – control

Vegetable insects: Woody Stewart – control

Wireworms: Robert Burrage and John Doane – ecology

Physiology: Norman Church – development; Al Ewen – reproduction; Richard Davis – nutrition

Pesticides: Jadu Saha – chemistry; Kenneth MacKinlay – toxicology

Some of the staff were also involved in international and national projects. For example, Hartley Fredeen was seconded to EXPO-67 in Montreal for three years (1965-67) to develop and manage a comprehensive insect control program to mitigate insect problems during EXPO.

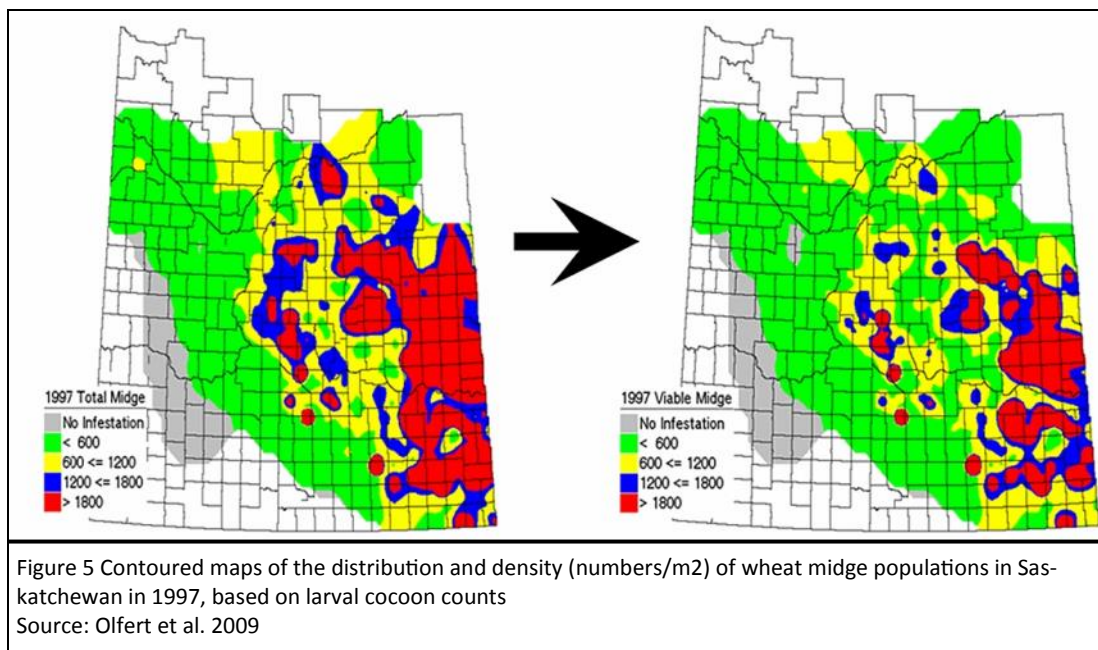
However, by the early 1980s, the IPM research team was down to 11 entomologists. Fortunately for producers, this core group was of sufficient size to begin to address the devastating outbreak of a new invasive alien species in 1983, wheat midge (*Sitodiplosis mosellana*). I decided to use wheat midge, as my second example, to continue the discussion on insect monitoring and forecasting. John Doane laid the groundwork for a unique monitoring and forecasting tool that tracked both the pest and its biological control agent, *Macroglanes penetrans*.

Monitoring of overwintering populations is conducted in fall by taking soil cores to a depth of 15 cm. The cores are processed by wet sieving as described by Doane et al. (1987), and larval cocoons and larvae counted. All larvae are then dissected to determine if they are parasitized. This unique monitoring tool allows researchers to quantify the positive impact of biological control in managing wheat midge below economic threshold, as well as determining wheat midge population distribution and density.

Figure 5 depicts wheat midge population distribution and density in 1997. On the left is a distribution and

density map of total number of midge larvae collected in soil samples. On the right is the same population, but only the viable midge data are presented; the parasitized larvae have been excluded. One can very easily see the positive impact of the parasitoid in reducing risk for the subsequent growing season. The decrease in red, blue and yellow areas reflects the reduction of midge populations in the province to below the economic threshold of 600 midge/ m2.

Using these data, Olfert et al. (2003) were able to estimate that the total savings in pesticide costs, due to biological control of wheat midge, were about \$248.3 million between 1991 and 2001. Average rates of parasitism in the study ranged from a low of 25% in 1996 to a high of 44% in 2001. The severe outbreak during the mid-1990's and the subsequent insecticide campaign to control wheat midge resulted in an overall decrease in the average rates of parasitism but they quickly bounced back by 1998. This achievement can be directly attributed to the successful implementation of parasitoid conservation techniques and the fact that wheat producers in western Canada



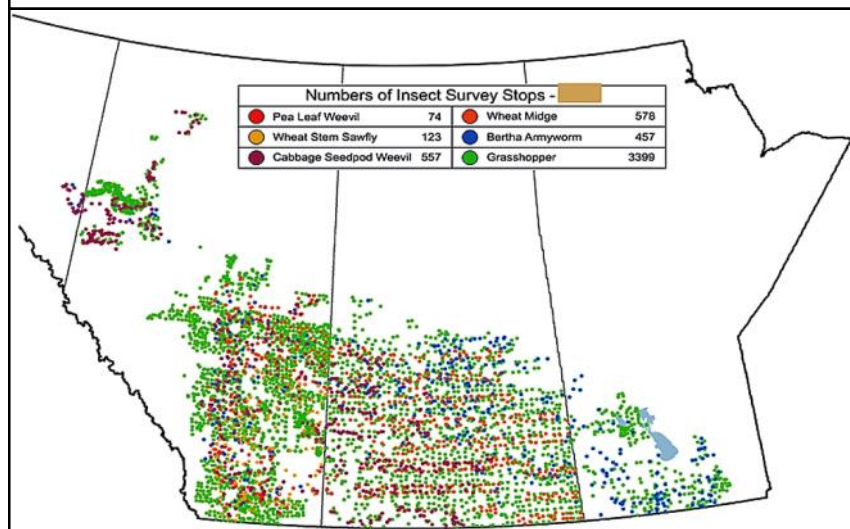
have access to one of the most comprehensive management programs of any insect pest of field crops.

Saskatoon Research Centre

In the mid-1990s, the federal agriculture Research Branch was significantly downsized nationally. However, facilities at CARS were retrofitted and greatly expanded and the new facility was renamed the Saskatoon Research Centre (SRC). Effectively, the number of staff at SRC doubled. However, public-good research (e.g., entomology) became a low priority with the director at the time, who favoured research with commercial potential. For almost a decade, the staff in the Office of Intellectual Property at Saskatoon outnumbered the five remaining entomologists.

Figure 6 . Example of GPS locations of major insect pest population survey data in the Prairie Ecozone in 2014.

Source: AAFC-Saskatoon Research Centre.



Due to similar declining entomology expertise at all federal centres within the Prairie Ecozone, there was a critical need to optimize resources in order to retain a presence in insect monitoring and forecasting. In response, the concept of a coordinated insect surveillance program took shape in the form of the Prairie Pest Monitoring Network (PPMN) in 1996. PPMN is not an official name, it's more like a description of a collaborative and coordinated suite of activities (technology transfer and research) related to insect pests of field crops and their natural enemies. Team members of the PPMN include provincial

(Continued from page 7)

government entomologists, industry agronomists, university entomologists and federal government entomologists. Funding for the team and its activities comes from crop commodity organizations, industry and governments.

The benefits accruing to agricultural science from the activities of the PPMN are significant. Insect ecologists have access to approximately 5000 insect population abundance/distribution data points annually and hourly weather data from 400 weather stations (Figure 6).

In addition to insect population data, wind trajectory data from Environment Canada are downloaded daily during the growing season for 50 sentinel sites in Canada and 20 in the USA and Mexico. Air parcels capable of carrying insect pests reflect the potential for migratory pest movement (Hopkinson and Soroka 2010). Current insect targets of the wind trajectory analyses include diamondback moth (*Plutella xylostella*) and aster yellow leafhopper (*Macrosteles quadrilineatus*). Trajectory analysis can be used to identify regions at risk on the prairies and, in turn, the analyses can provide input for the development of management strategies (Figure 7).

In summary, all data generated by the PPMN are archived in a crop - insect - weather database. The database is a significant resource for identifying knowledge gaps and developing management tools. In addition, future impact assessments of climate change, new agronomic practices and new crops on pests and their natural enemies are within its scope.

The distribution and abundance of insects are correlated with climate, weather, agronomic practices and natural enemies. As a result, the data can be used to develop and validate bioclimate models. By exploiting these ecological data sets, bioclimate simulation models can be used to identify broad patterns in population distribution and abundance

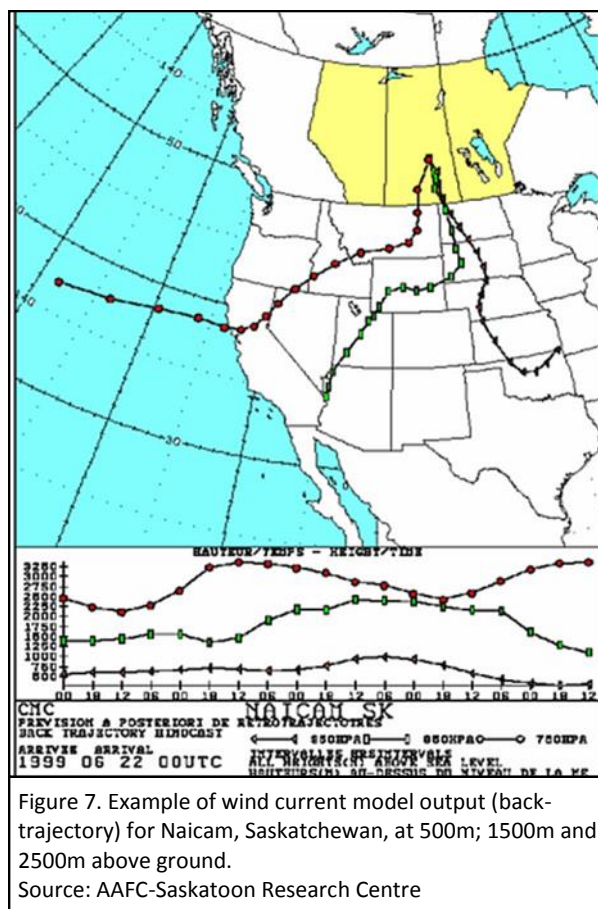


Figure 7. Example of wind current model output (back-trajectory) for Naicam, Saskatchewan, at 500m; 1500m and 2500m above ground.

Source: AAFC-Saskatoon Research Centre

(agricultural risk). I will illustrate this using as examples diamondback moth and grasshoppers.

Using the date of migratory diamondback moth adult arrival in Canada as a 'bio-fix' date in our bioclimate model, together with Long Term Normal temperature data, we can predict the potential number of generations (crop risk). Number of generations per year is one of the important factors that influence the pest status of diamondback moth. In western Canada, diamondback moth usually has three generations per growing season. The potential for crop yield loss increases with additional generations.

We have a bioclimate model for *M. sanguinipes* and have applied climate change scenarios to assess the potential impact of climate change on grasshopper ecology. Olfert et al. (2011) have shown that, compared to predicted range and distribution under current climate conditions, *M. sanguinipes* would have increased range and relative abundance under three commonly-used

general circulation model scenarios in more northern regions of North America. Conversely, model output predicted that the range of this crop pest could contract in regions where climate conditions became limiting.

Conclusions

Entomology in this province had humble beginnings with the launch of the Dominion Entomological Laboratory in 1918. However, the demand for entomology expertise flourished as agriculture expanded with increased settlement of the Prairie Ecozone. The discipline peaked at the Canada Agriculture Research Station in the 1960s, with a scientific staff of 20 entomologists who had a broad range of expertise. In 2014, this number has been reduced to four scientific research positions at the Saskatoon Research Centre. However, insect ecology monitoring and forecasting are as strongly supported by farmers today as they were in 1918.

Given that the current cadre of entomological research staff at the Saskatoon Research Centre is nearing retirement, succession planning is critical in order to retain the entomological benefits that the agriculture industry has come to expect from DEL, CARS and now SRC for nearly 100 years. Entomology truly has been a major contributor to the success of agriculture in western Canada and, as such, is a most interesting heritage subject.

Acknowledgements

When first approached about the Heritage Lecture, my first thoughts were that these were awfully BIG shoes to fill! After all, Paul Riegert set a very high bar for entomological 'Heritage' in this province (and nationally). On a personal note, I recall that Paul had a short weekly segment on CBC radio years ago titled 'The Bug Doctor' where he would answer questions about insects. I don't know which came first, but I heard that he also had a personalized licence plate for his car: 'BUG DR'. In retrospect, it would have been equally appropriate for the plate on his car to have been 'HERITAGE DR'. I would like to thank Drs Julie Soroka and Cedric Gillott for comments on an earlier version of the manuscript. And I would like to acknowledge the tremendous assistance of the staff at the University of Saskatchewan Library Archives.

— Owen Olfert

Footnote: Owen Olfert (owen.olfert@agr.gc.ca) is a senior research scientist at AAFC Saskatoon Research Centre, specializing in management of insect pests in prairie agriculture systems. Owen's research involves development of management tactics for control of insect pests in field crops, including the development of population monitoring and forecasting tools, alternative control technologies and bioclimate modelling.

This heritage lecture was presented at the 2014 ESC Joint Annual Meeting held in Saskatoon.

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Noteworthy Records of Orthopteroid and Hemipteroid Insects from Southwestern Saskatchewan and Southeastern Alberta

Abstract

A first Canadian record is provided for *Apiomerus spissipes* (Say) (Hemiptera, Reduviidae) from southeastern Alberta. First Saskatchewan records are given for: *Labia minor* (Linnaeus) (Dermaptera, Spongiphoridae), *Udeopsylla robusta* (Haldeman) (Grylloptera, Rhaphidophoridae), *Ceratocombus vagans* McAtee & Malloch (Hemiptera, Ceratocombidae), *Barce uhleri* Banks (Hemiptera, Reduviidae), and *Empicoris pilosus* (Fieber) (Hemiptera, Reduviidae). New distribution records and habitat information is provided for four other species previously recorded from Saskatchewan.

Over the past few years I have been collecting and observing insects around my home in southwestern Saskatchewan. My focus has been mainly on beetles (Coleoptera) and these records have been used to develop a checklist of the beetles of Saskatchewan (Hooper & Larson, Larson & Hooper in preparation). However, I am interested in learning about the overall insect fauna of the area so also collect generally to develop a collection of specimens useful for identifying local species and as a source of voucher specimens. Some of these records may be of interest to other naturalists so I have selected a few from the Orthopteroid orders and Hemiptera that add new species to the Saskatchewan faunal list or contribute to our understanding of the status of already known species.

The classification and nomenclature of orthopteroids follows Vickery & Kevan (1985); that of Hemiptera follows Maw et al. (2000). Abbreviations used in the following list are two letter

abbreviations for provinces and states and N,S,E and W for direction. The last section of each species account gives the label data of the voucher specimens in my collection.

1. Dermaptera, Spongiphoridae
Small Earwig. *Labia minor* (Linnaeus) (Fig. 1). Recorded by Vickery and Kevan (1985) from Medicine Hat, AB and southern MB, but not from SK. This introduced species is probably not very cold hardy for it is largely synanthropic at the latitude of southern Canada. It is primarily a scavenger with specimens typically found in sites such as in manure piles, stables, among decaying plant material and mushrooms, etc. SK specimens were collected in a household/garden

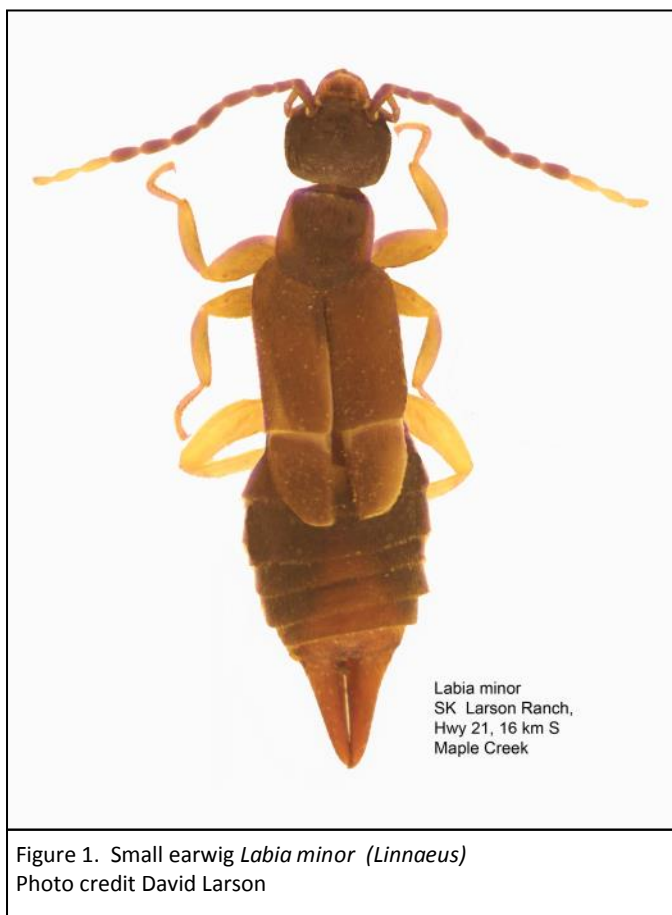




Figure 2. *Udeopsylla robusta* (Haldeman) Photo credit David Larson

compost pile. The species flies readily and comes to light. I collected a number of specimens from a light trap at the Agriculture Canada Experimental Farm in Lethbridge, AB, during the mid 1960's but do not know what happened to the specimens. The species will probably be discovered to be widespread in protected sites across the southern prairies.

SK: Larson Ranch, Hwy 21, 6 km S Maple Creek, D. Larson (immatures Sept. 8, adults Sept. 17, 2013).

2. Grylloptera, Rhaphidophoridae, Ceuthophilinae
Large camel cricket. *Udeopsylla robusta* (Haldeman) (Fig. 2). Vickery and Kevan (1985) show collection records from SW MB and ND but not from SK. They report the species lives in burrows dug in loose soil such as plowed fields, in gardens and roadsides. It is nocturnal but has been found in early mornings and late evenings on the surface. The area from which I collected specimens is underlain by heavy clay soil but where specimens were found the soil was loose, e.g. under a board in a dug flower bed, along south-facing slopes with sparse short-grass vegetation and where the soil was loose from erosion and pocket gopher activity. Several specimens were found on the surface in early morning, one feeding on a coyote scat.

SK: Larson Ranch, Hwy 21, 16 km S Maple Creek, D. Larson (adults Aug. 31 - Oct. 25)

3. Grylloptera, Tettigoniidae

Bog katydid. *Metrioptera* (= *Sphagniana*) *sphagnorum* (Walker). Vickery and Kevan (1985) show this as a boreal insect occurring from northern BC and southwestern NT to PQ. They map records from Prince Albert and Saskatoon areas and Empress, AB, area. An ON habitat is described as open grassy places along paths and roads in swampy areas where black spruce predominated. Capinera et al. (2004) claim the species occurs only in or near sphagnum bogs. I have collected specimens from the Cypress Hills where they occur in much drier habitats, generally in patches of rough fescue and *Potentilla* bordering lodgepole pine stands. Adults occur in late August and September.

SK: Cypress Hills Provincial Park, W Block, 49° 34'N 109° 58'W, 4400 ft, Aug. 29 2009, D. Larson; Cypress Hills Provincial Park, E Block, Sucker Creek, Aug. 29 2009, D. Larson.

4. Orthoptera, Acrididae, Gomphocerinae

Obscure grasshopper *Opeia obscura* (Thomas) (Fig. 3). Vickery and Kevan (1985) show collection localities across extreme S SK and adjacent AB and MB. Johnson (2003) collected the species as far north as Oyen, AB, and Lloydminster, SK. This is a common species on short-grass prairie, especially on dry, eroded, south-facing slopes. The life history is described as univoltine with overwintering in the egg stage. This species is included

(Continued from page 11)

because in the Maple Creek area in 2014 there were large numbers of nymphs present until at least mid-October which is unusually late for an egg-overwintering species. Was this due to delayed development in a cool summer or might some of the population overwinter as nymphs? This needs to be investigated.

5. Orthoptera, Acrididae, Gomphocerinae
Bunch grass grasshopper. *Pseudopomala brachyptera* (Scudder) (Fig. 4). Vickery and Kevan (1985) indicate a collection record from extreme SW AB but no SK or MB records. Capinera et al. (2004) include the southern portions of BC to MB in the species range. Johnson (2003) reported the species occurring as far north as Provost and Coronation in Alberta. He suggests the species increased in abundance and distribution in previous dry years. This very slender grasshopper, appropriately called a toothpick grasshopper, is reported to occur in tall, dense, grasses including *Andropogon* and *Agropyron*. but Johnson relates its current

widespread distribution to occurrence on brome grass along prairie roadsides, which very much fits my experience. Most specimens I have seen have been in patches of brome along unmowed and ungrazed road and railway allowances. Although these insects are difficult to find amongst dense grass, the species appears to be unusually susceptible to environmental influences and may be useful to monitor for climate change or land use effects in the southern prairies.

SK: 15 km NE Maple Creek, Sept. 12 2008, D. Larson, sandy road allowance; Frenchman River Valley 4 km W Ravenscrag, Sept. 20 2009, D. Larson; Cypress Lake, July 31 2010, D. Larson, yellow pan; Grasslands National Park, E Block, Tp. 1 & 2 Rge 6 & 7 W 3, Aug. 11-12 2009, EBGE pitfall trap.

AB: Lower Milk River, Pinhorn Ranch, Oct 4 2010, D. Larson.

6. Hemiptera, Ceratocombidae
Ceratocombus vagans McAtee & Malloch. Maw et al. (2000) give the Canadian range as BC, AB?, ON and PQ and Scudder (2014) does not list it as a species of the Grassland ecozone. The species



Figure 3. Obscure Grasshopper. *Opeia obscura* (Thomas) Photo credit David Larson.



Figure 4. Bunch grass grasshopper. *Pseudopomala brachyptera*. Photo Credit David Larson. This is a staged photograph. Normally these insects cling vertically to grass stems, and invariably position themselves on the opposite side of the stem from the camera.

has subsequently been found in NF so it is probably transcontinental in the boreal zone. These minute (0.75 - 1.5 mm) predatory bugs occur on the forest floor in litter or among mosses and are seldom seen without focused collecting. I collected one specimen while sifting feather moss and mushrooms in a moist draw in a white spruce/ aspen stand.

SK: Cypress Hills Provincial Park, Center Block, Sucker Creek, spruce-aspen woodland, Sept. 7 2014, D. Larson (1Male).

7. Hemiptera, Nepidae

Waterscorpion, *Ranatra fusca* Palisot. Maw et al. (2000) recorded this species from MB, ON and QC. It has subsequently been recorded from SK (Parker and Phillips 2007) and AB (Farrus and Gotceitas 2011). I have found it regularly in dams and dugouts in the Cypress Hills area, particularly those that retain water throughout the year. Immature specimens have been seen in August, adult specimens in May, September and October right up to the time of freeze-up and it appears as though adults overwinter under the ice, thus their occurrence in deeper ponds. One specimen was collected from wind-drift in a large reservoir in May indicating spring dispersal of adults but specimens have also been collected on a house patio

(Sept. 7) and from a stock tank (Sept. 21) indicating fall flight typical of species inhabiting permanent water. Interestingly this species has been found co-occurring with the water beetle, *Dytiscus hybridus* Aubé, an eastern North American species that similarly reaches its northwestern limits in SW SK and SE AB (Larson et al. 2000).

SK: Harris Reservoir, 10 km S Maple Creek, May 12 2012, D. Larson (in drift); Larson Ranch, Hwy 21 16 km S Maple Creek (Sept. 7 2006 - on porch; Sept. 21 2008 - stock water tank; Sept. 30 2013 - large dugout)

8. Hemiptera, Reduviidae

Bee assassin *Apiomerus spissipes* (Say) (Fig. 5). Maw et al. give BC? as the only Canadian record for *Apiomerus* (*A. crassipes* (Fabricius)). Two specimens collected in SE Alberta (Pinhorn Ranch, Lower Milk River near US border, 110° 48' W 49° 07' N) key to *A. spissipes* because of their red corium and largely red pronotum (anterior lobe with broad black vermiculate markings, apical margin yellow), whereas these areas on *A. crassipes* are chiefly black (Slater & Baranowski 1978, Berniker et al. 2011). Berniker et al. (2011) record the species as having a wide distribution in the western US with records extending from MT and ND south into Mexico and AZ.



Apiomerus
AB Milk River,
Pinhorn Ranch
July 8, 2012
D. Larson

Figure 5. Bee assassin. *Apiomerus spissipes* (Say)
Photo Credit David Larson

(Continued from page 13)

AB: Milk River, Pinhorn Ranch, July 8 2012, Larson & Hartly, on Colorado rubberweed (1 Male 1 Female).

9. Hemiptera, Reduviidae

Barce uhleri Banks. Maw et al. (2000) record two species of *Barce* from Canada: *B. fraterna* (Say) which occurs from BC to NS, including the three prairie provinces; and *B. uhleri* recorded only from ON. The 3 SK specimens I have seen have the genital

characteristics of *B. uhleri* as illustrated by Wygodzinsky (1966, Fig. 135), namely male pygopore with a dorso-apical notch from which arises a setose rod which apically curves into a posteriorly directed spine (notch and rod lacking in *B. fraterna*) and female with apical tergite of abdomen bluntly rounded whereas in *B. fraterna* it is distinctly emarginate. Therefore I interpret these specimens as *B. uhleri*. Wygodzinsky stated the proportion of winged specimens in this species is small, however the 3 SK specimens all have full wings.

SK: Old-Man-on-His-Back Ridge, 49°11'N 109°16'W, Sept. 5 2009, D. Larson, under clump of *Opuntia* (1 Male); Grasslands National Park, Tp 1 & 2 Rge 6 & 7 W 3, Aug. 10-11, 2008, EBGE, pitfall trap (1 Female); Bigstick Lake, N Maple Creek, June 17 2013, D. Larson, sweeping mixed prairie (1 Female).

10. Hemiptera, Reduviidae

Empicoris pilosus (Fieber). Maw et al. (2000) record two introduced species, *E. pilosus* (BC, ON, QC, NS) and *E. vagabundus* (Linnaeus) (BC, ON, QC, PE, NS, NL) with no Prairie records. The two species are very similar but differ in that the fine setae of the antenna and legs of *E. pilosus* are longer (length of longer setae of antenna 4x antennal width versus subequal to antennal width in *E. vagabundus*) (Wygodzinsky 1966). The single SK specimen has the long setae. The specimen was collected by sweeping understory vegetation in a spruce/aspen woodland.

SK: Cypress Hills Park, Center Block, Highland Trail, Aug. 24 2013, D. Larson (1 Male).

- David J. Larson

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The Entomological Transporter

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- Saskatchewan Aquatic Bug Guide (Dale Parker's Amazing Site)
<http://www.aquatax.ca/BugGuide.html>

- Master List of On-line Taxonomy References
<http://bugguide.net/node/view/338170>

- Beetles in the Bush (Some great photography)
<https://beetlesinthebush.wordpress.com/>

- Insects in Canadian News (part of the Insects of Alberta Site) <http://www.insectsofAlberta.com/news-canadian.htm>

- Charismatic minifauna (Wired magazine's bug offerings) <http://www.wired.com/category/charismaticminifauna/>

- Bryan Pfeiffer's blog (Some great nature-writing and photography with a slight bias towards dragonflies) <http://bryanpfeiffer.com/blog/>

Youth and Amateur Encouragement Activities

For the past 15 years, the Members of the ESS have participated in many events to promote bug knowledge and enthusiasm for Entomology from the public. Members have actively participated in many events aimed at increasing interest for insects and their importance in our lives. They gave talks or presentations in classrooms, displayed the ESS collection of pinned insects along with living specimens on benches in picnic areas, near the beaches, or recreation areas in parks or participated in field's days and answered many questions from the public.

During the summer 2014, Chrystel gave presentations in Meadow Lake, Buffalo Pound, Moose Mountain and Sask Landing Provincial parks with 2 presentations during the week-end in Meadow Lake. This year, the ESS participated for the first time in the educational day during the 9th "Wings over Wascana" festival at the Wascana marsh in Regina, where students from grades 4 to 6 took part in a fun filled day of outdoor

nature awareness activities. Students participated in 8 different stations set up in tents or naturalized areas. These stations consist of diverse nature related activities such as owl pellet dissection, pond dipping and bird banding. The ESS staffed the butterfly station, displaying living specimens belonging to various life cycles of bertha armyworms and helping students identify butterflies caught with nets. In October 2014, ESS members participated for the 2nd year into "Kids gone wild for wildlife: a wildlife educational event", a 1 day event at the Saskatoon Exhibition park, targeting kids and their parents to learn more about wildlife and its importance in SK. Here is ESS members Lars Andreassen helping out cute little future entomologists like Eliana Wist marvel at the pinned insect collection.

Sometimes, ESS members are asked to give classroom presentations at schools. Tyler Wist presented a PowerPoint talk on some of his work in relation to insect lifecycles to Mrs. Weinheimer's (at intern Kerry Klassen's request) grade two and Mrs. Ostertag's (at intern Jessica Bercheid's request) grade three

classes at Holy Family to kick off each of their science units on lifecycles. Tyler used the pinned Saskatchewan insects as well with many thanks to Murray Braun for the new labels. After the presentation, the grade twos got to create pictures and give statements about what they had learned from the "bug doctor". The picture to the



ESS at Moose Mountain



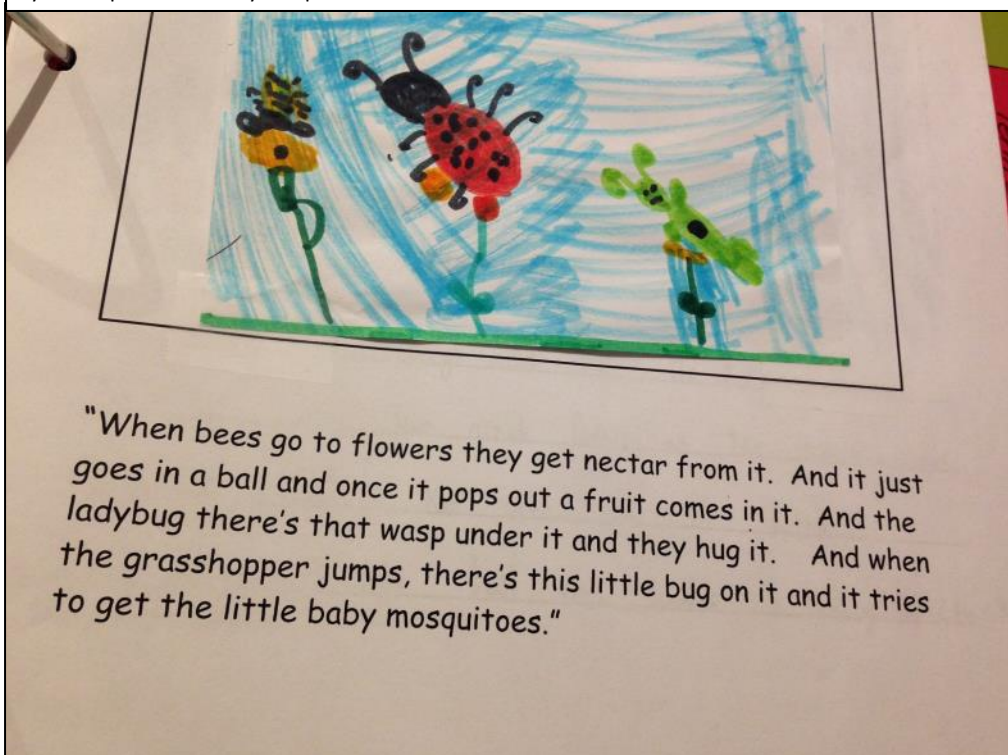
Wings over Wascana

right is a drawing and legend (the student dictated the picture's legend to the teacher who wrote it as it was spoken) with the corresponding pictures that inspired the middle drawing. This gives us an idea of what concepts really impressed the students, their understanding of what was presented and indicates which ones we should watch for when we need scientific illustrators.

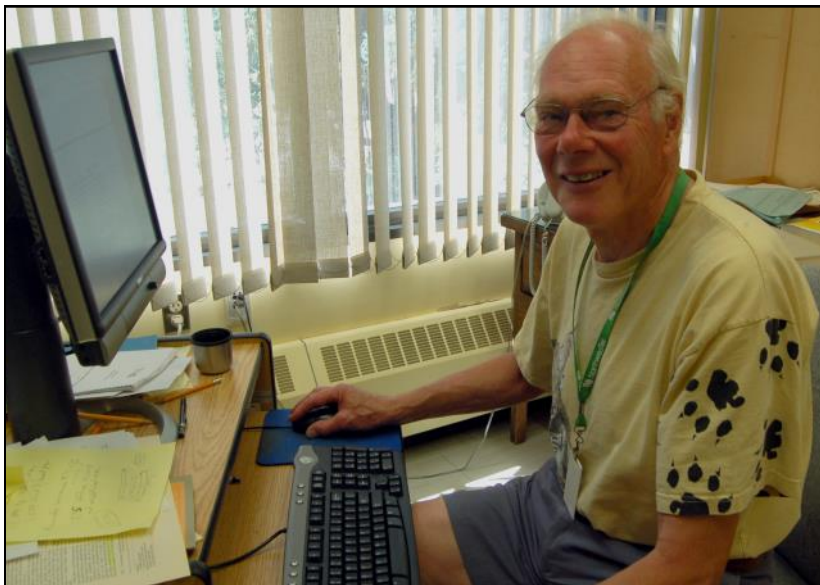
Each year, ESS members give oral presentations on insect to grade 2-4 school students during the "Little Green Thumbs School Tour Program" program, as part of GardenScape in Saskatoon. In 2014, the ESS members educated 1000 grade 2-4 students (and their teachers) from 26 schools on the differences and similarities between a good bug and a bad bug. The ESS also hosted a booth during the public hours of GardenScape that contained living and pinned insect displays as well as posters on entomological research conducted at AAFC – Saskatoon Research Centre.

— Chrystel Olivier and Tyler Wist

Nyaomi's picture after Tyler's presentation



In Memory of Peter Harris (1930 – 2014)



An icon in Canadian entomology was lost in August of this year with the passing of Dr Peter Harris at the age of 83. Highly respected at home and internationally as a pioneering leader in *classical weed biological control*, Peter will be remembered for laying the foundations for and then greatly contributing to Canada's reputable programme in this field of applied study. For future generations, he also has left an enduring legacy with the successful mitigation of some of western North America's most invasive rangeland weeds.

Born and raised in England, Peter first came to Canada in 1950 to obtain his BSc (1955) in the Faculty of Forestry at UBC. It was during his undergraduate degree, which also included a summer job with the Federal Division of Entomology (FDE), Belleville, Ontario, Substation on the UBC campus, that Peter's interest in entomology was ignited through the study of forest pests (e.g., bark beetles; see Peter's 2007 Heritage Lecture, *ESC Bulletin*, **39**(4): 154-160). While at UBC, Peter also met his wife, Irene (m 1957), and rose to some prominence as an award-winning track and field athlete. These early years of athletics did not fade with time for Peter or Irene (or their three children), as they made physical activity a central part of their lives. After completing his BSc, Peter returned to England to obtain a PhD in entomology at the University of

London (1958), studying the European pine shoot moth, although he maintained Canadian ties by collaborating on the same forest pest with FDE entomologists in Belleville and Sault Ste Marie, Ontario. This sustained Canadian connection likely contributed to his hire in 1959 into a biological control research position with Agriculture Canada, which was the beginning of a highly productive career that would span 36 years. He first worked at the 'Research Institute' in Belleville, until its closure in 1972, then at the Research

Station in Regina, until it closed in 1992, and lastly at the Agriculture and Agri-Food Canada - Lethbridge Research Centre (AAFC-LRC) until he officially retired in 1995. However, being one to never sit physically or mentally idle, Peter continued to jog and work as an emeritus scientist at LRC until early 2014.

Peter was innovative, a 'big picture' thinker, tenacious and politically astute, which helped greatly in the formative years of the Canadian biological control programme. He persistently sought out, engaged and recruited those who could help him achieve his unwavering goal of providing agricultural producers and land managers with a reliable, economical and environmentally safe weed control option. Through his enthusiasm, drive and practical knowledge, he was often able to deliver. Very early in his career, Peter cultivated close collaborative ties with entomologist colleagues at CABI (formerly the Commonwealth Institute for Biological Control and International Institute for Biological Control) in Switzerland, which has been the contracted source of European weed biocontrol agents for Canada now for over 60 years. Working in close partnership with CABI legends, Dr Helmut Zwöelfer and subsequently Dr Dieter Schroeder, Peter set Canada's priorities for the overseas surveys, selection and host specificity testing of mostly insect agents for a number of damaging rangeland weeds. During his career with AAFC, Peter released and field assessed 36 insect and 1 nematode species, of which 70% established in

Canada (a high percentage for weed biological control globally) and about a third of these have had measureable impact on their target weed hosts. He had excellent instincts in predicting which agents would be successful based on a broad knowledge of entomology and botany and keen observational skills. He typically was engrossed in developing mechanistic hypotheses on why an agent either succeeded or failed, and could easily bridge disciplines to arrive at novel approaches and conclusions to explain observed field patterns (e.g., his application of soil microbiology with a colleague to investigate the role of plant mycorrhizae in weed biological control). Some of Peter's acclaimed successes include the biological control of diffuse and spotted knapweeds in British Columbia using a suit of 11 established insects working in concert, and of leafy spurge in our Prairie Provinces using a complex of root-feeding flea beetles (*Aphthona* spp). He also is recognized for using biological control to produce major reductions of the pasture weed, nodding thistle, such that herbicide use against the weed was no longer needed in most areas, thus accruing savings for affected livestock producers. Many of the successful agents introduced into Canada by Peter were subsequently approved for use by the USA against the same weeds. Among Peter's many contributions to the science of classical weed biological control were those that advanced the field globally through their immediate and sustained application by researchers. Together with colleagues, he played a major role in the development of currently used host specificity testing protocols. Peter was ahead of his time in advocating for consideration of both crops and native plant species of concern when delineating the host range of candidate biocontrol agents during pre-release testing. He also encouraged a process of independent scientific review of petitions for agent release, thereby reducing conflicts of interest for the researchers that produce and submit the petitions to regulators for decision. Other contributions of note were his development of an easy-to-use, standardized scoring method for assessment and comparisons of agent impact in the field, and the first to implement an economic analysis of the costs and benefits of weed biological control that could help in selling it to potential project funders.

Peter also was tireless in encouraging general acceptance and adoption of weed biological control in Canada through its promotion to both industry and governments, and the staging of public extension activities. He readily

shared and spread his biological control successes by directly engaging the provinces and other stakeholders in educational hands-on events (e.g., farmer field days for the redistribution of leafy spurge beetles), thus engendering an understanding and sense of ownership of the projects and a personal connection with the insect agents. As a result, many a field person grew fond of the insects they managed and became loyal converts to biological control after witnessing what it could do for weed control. When project funding declined, Peter created the concept of 'weed biological control consortia', which brought Canadian and American stakeholders together to jointly fund the overseas exploration and testing of new agents for weeds of common interest. Among his many accomplishments and awards for his career contributions, a few stand out as particularly noteworthy. These include: published papers in both *Science* and *Nature* in 1969 reporting on how mosquitoes sometimes benefit from feeding on insect haemolymph; made a Fellow of the ESC (1984); awarded the Commemorative Medal for the 125th Anniversary of Canadian Confederation (1994); given an award of recognition by the Canadian Forum for Biological Control (1996); awarded the ESC's Gold Medal (1997); inducted as a member of the Order of Canada (1997); formally recognized by his biological control peers at the International Symposium on the Biological Control of Weeds (1999); and made an Honorary Member of the ESAB (2008).

Peter inspired a whole generation of weed biological control researchers and practitioners with his boundless energy and dedication to learning more about the art and science of his field of study. After notifying the international weed biological control community of his recent death, there was an overwhelming response of personally shared stories of how Peter helped in individual careers and lives. For those who knew him, he was an impressive, likeable man that will be greatly missed by his friends, colleagues and family.

— Rose De Clerck-Floate
AAFC, Lethbridge Research Centre

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Praying Mantis 3.0



Figure 1. Chinese (Oriental) praying mantid eating a mosquito.

I think the defining moment in every budding young entomologist's life is the first time they poke holes in the lid of a jar and gently place an insect inside as a "pet". I remember feeding grass and leaves to numerous ladybugs and being rather disappointed when none of them ate and all of them died on this herbaceous diet. Those were dark, dark days before Google searches and Wikipedia gave us instantaneous information on everything.

Perhaps then, the defining moment in the life of the young entomologist where a specialty in biological control becomes apparent is the first time that they feed one insect to another insect. The pinnacle of this fascination is, in my humble opinion, reached in the form of raising a praying mantis (and for those of you with deep roots to Mother England that would be a praying mantid). My first praying mantid experience (1.0) occurred while I was in University (for the first of three times). I acquired an ootheca at the Victoria Bug Zoo (<http://www.bugzoo.bc.ca/>) for the nominal fee of \$10 while on a trip to visit my grandparents, who had migrated from Saskatchewan for the warmer BC climate within 12 hours of retirement. I attached the

ootheca to the hanger of a hanging plant, which was too tall to fit inside the large terrarium that I had purchased for the eventual mantid babies so it stuck out through the door in the lid. I dutifully misted the ootheca to keep it moist and increase its chances of successfully producing baby mantids. After midnight, on one particularly hectic evening at the hospital emergency room, I returned to find tiny, first instar mantid nymphs radiating out from still exposed ootheca, with the earliest hatchers a good two metres from their oothecal start line. So with a duo of paint brushes, my future wife and I and her broken arm, delicately picked up hundreds of baby mantids

and placed them into the cage where they belonged. The following night we repeated this ritual because the slits in the roof of the terrarium were not small enough to confine the mantids. I modified the terrarium roof with a piece of thin netting to keep them after that incident. I scrambled to find food for these little mantids and eventually established a colony of mealworm beetles in a container of bran that I got from the now defunct "Speers Seed and Pet Store". The mealworm larvae however, were too big for the small mantids and so to effectively feed the nymphs I had to cut the mealworm larvae into pieces and wave them in front of individual nymphs until they took a swipe at it and successfully held the piece in their raptorial front legs. You can imagine how time consuming that was. Half of the mantids though, found their own food in the form of the other half of their brothers and sisters. I quickly learned that mantids are cannibalistic AND territorial, which is not a good combination in a terrarium. In the end I had one large female, but she had eaten her future mate (the last mantid standing) before their adult molt, so there were no eggs cases from that lot. She died of old age after about nine months of what appeared to be a stroke. These mantids are "The

Oriental Praying Mantis" (*Tenodera aridifolia*...but possibly *T. sinensis*) and were released in North America for biological control over a century ago so they are legal to purchase and release. Praying Mantis hatch 2.0 coincided with summer and my job with the City of Saskatoon Pest Management Crew so I was able to sporadically bring in prey insects like aphids. Only a handful of mantids hatched from this ootheca however, and the price had increased to \$15 (and \$21.99 as of publication) from the Victoria Bug Zoo. One mantid made it to adulthood again. Praying Mantis 3.0 occurred in spring 2013 from an ootheca purchased for \$17.99 from Costco.ca (the cheapest vendor that I could find online). (<http://www.costco.ca/Praying-Mantis-Natural-Insect-Control-Egg-Case.product.10300216.html>). This time I had children to entertain and teach about the fascinating world of mantids! It took a bit to convince my wife that this was a good idea to try again (remember 1.0) but I finally convinced her with the promise that fully grown mantids would keep the rampant spider population of our yard in check. The instructions with the ootheca were similar to before but it came wrapped in a mesh bag that allowed the egg case to be easily hung from the lid of the same terrarium. This time I set the cage up with mesh and kept the lid closed. After three-four weeks of misting the ootheca it hatched to my delight and the delight of my girls. My eldest daughter promptly took five nymphs to school in plastic

containers with instructions from her daddy to "catch bugs with your classmates at recess to feed the mantids". All five died. I moved several other nymphs into individual containers to avoid the cannibalism problem and left some nymphs in the large terrarium. This time I wanted to make use of the biological control services of the mantids in an effort to control scale insects on my newly planted dogwoods. I had lost one bush to scale insects the previous season and so I hoped that a release of dozens of mantids onto the remaining two dogwoods would control the nymphal generation of scale insects. They didn't. I lost another dogwood. I released over one hundred mantid nymphs into my yards...all of which I never saw again. I am hoping that some survived to adulthood and that there is an ootheca somewhere in my yard ready to hatch the 4.0 generation...but I doubt it. Oh, and the spider population of our yard? Still rampant. I feed the remaining mantids with live insects that I caught with a light trap and dumped into their containers. The mantid diet contained moths, flies and mosquitoes (Fig. 1). There is almost nothing more entomologically satisfying than seeing a mantid catch and eat an *Aedes (Ochlerotatus) vexans* (Fig. 1). Even with a steady diet of live insects the mantids continued to feed on each other (Fig. 2) and I happened to catch the last pre-adult female snacking on the last pre-adult male (Fig. 2 note the spent ootheca in the mesh bag) before their adult moult...again. Even after such a large

meal my last mantid died within a few days...probably from a broken heart. Sigh. If Costco.ca ever gets the egg cases off of backorder I may start Praying Mantis 4.0 this season...unless I find 4.0 in my backyard this spring.

— Tyler Wist

Figure 2. Chinese (Oriental) praying mantid eating her brother while sitting on their ootheca.





Entomology at the NatureCity Festival

The NatureCity Festival Week was held across Saskatoon from May 25 to 31st, 2014, to celebrate and explore nature in an urban setting through a variety of activities. The crew at TRoutreach Saskatchewan were fortunate enough to take part in the event. TRoutreach blends research, mainly focused on macroinvertebrates, and public outreach with a desire to share our love for the environment with others.

To add an entomological component to these urban activities, the not-for-profit organization TRoutreach Saskatchewan took part in teaching young students about macroinvertebrate and epigeic beetle communities at parks and natural areas around Saskatoon. TRoutreach met with many different schools throughout the week of the festival including Mayfair Community School, Bishop Klein School, Ecole St. Gerard School, W.P. Bate Community School, Ecole St. Paul School, and a Family Child Care Group Home. At these



presentations, the TRoutreach students displayed pinned collections to highlight some of the diversity found throughout the city and the province of Saskatchewan, and demonstrated different techniques used for catching insects. With some hands-on assistance and encouragement, they provided clues as to where the primary school students might find six-legged friends, and initiated student-led insect hunts. Student engagement and knowledge of the subject was wonderful to see.

Due to the great success of the festival, NatureCity organizers will look toward expanding the entomological presentations during the week and TRoutreach would like to fold these activities into a larger participation from the Entomological Society to fill the demands in future years. If you are interested in volunteering as a leader in next year's festival please write to :

troutreach.sk@gmail.com.



— Iain Phillips



Summer Student Employment in Aquatic Entomology and Fisheries

In the summer 2015 the Water Security Agency Benthic Entomology lab will be hiring two research assistant positions to work on flood mitigation and aquatic science in the Fishing Lake area of Saskatchewan. If you are eager to get experience in aquatic entomology and management please watch the Water Security Agency website through January and February 2015 for the specific description and instructions for where to send your applications (www.wsask.ca).

— Iain Phillips



Above: Water Security Agency Benthic Entomology Lab staff collecting benthic macroinvertebrate samples from Fishing Lake.

Left: Caddisfly from Fishing Lake Project; note the pink flagging tape which had been incorporated into the caddisfly case.



The Dark Hidden Corner

This fall's ESC-ESS JAM was a fantastic success. All together there were more than 150 different presentations (poster, plenary, and other-wise)! It was my first opportunity to attend a JAM and I certainly wasn't disappointed. Thanks to the volunteers, attendees and sponsors—but especially thanks to the Local Organizing Committee (whose names appear on page 3) for all your excellent work. A good time was had by all.

There are times when being the ESS Editor is a little less than glamorous. Consider, for example, when you are one week from submission deadline and there hasn't been a single expression of interest? Believe it or not, that's how this edition of the ESS Newsletter started out. Obviously something happened!

This has turned out to be our largest edition of the newsletter to date and there are a lot of people to thank! Of particular note: I would like to thank Tyler Wist for stepping up to the plate: not once; not twice; but three times in this current edition. Tyler has been a stalwart contributor and we are certainly grateful for his continuing narrative on all things entomological.

I'm also thankful for the exceptional contributions of David Larson. I first came to know David's name when working on a consulting project for the Department of Fisheries and Oceans in the early 1990's. Few people would realize, given his exceptional knowledge of insects, that David wrote the definitive guide on forest harvesting impacts on stream fish

habitat in Saskatchewan back in the mid 70's! He's obviously progressed to the smaller and more diverse topic of insects but the quality of his work continues to shine. Thanks also to Cedric Gillott for allowing us to include Owen Olfert's Heritage lecture and suggesting we include Rose De Clerck-Floate's excellent biography of the late Peter Harris.

Finally I would like to thank Chrystel Olivier for her joint submission with Tyler and I want to thank Iain for posting what I believe is the very first employment advertisement in this newsletter (see above). Hopefully it is a harbinger of things to come.

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