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The Canadian Honey Council (CHC) is the national organization of the Canadian beekeeping industry and Hivelights is the industry’s magazine.

In order to receive Hivelights you must be a current member of your provincial association. Non members such as Hobby Beekeepers, Honey Packers, Urban Beekeepers or Canadians with interests in Beekeeping can subscribe to the magazine for a $25.00 subscription fee per year.

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Cover story - Beekeeping in Art II
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Hivelights Magazine

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With any kind of luck, when you read this, winter will be a distant memory. For many regions of the country it was mild and reports in March indicated that, for the most part, overwintering survival was quite good. That can change, but it’s a good start. Costco Canada has recognized the importance of bees and are setting aside a portion of their honey sales and dedicating it to Canadian bee research projects. This additional funding is not only welcomed by the research community, it is also welcomed by beekeepers across Canada who will benefit from that research.

The Pest Management Regulatory Agency (PMRA) released a couple of consultation documents early in the new year that could impact beekeepers and the CHC made brief comments. For the Re-evaluation of Imidacloprid - Preliminary Pollinator Assessment, the CHC indicated that “The interim report is important in that it supports the use of risk-based assessments in understanding the factors that impact bee health. This science-based approach, conducted by our highly regarded regulatory agency, will provide beekeepers with the proper information from which to base business decisions.”

For the Notice of Intent Regarding Conditional Registrations under the Pest Control Products Regulations the CHC had to weigh the fact that this process is used by companies that register bee products and in fact Apivar is currently a conditionally registered product. Still, in summation we indicated that, “There are flaws in the current system, particularly since most of the conditional registrations on the books pertain to one class of chemicals, neonicotinoids. Despite public pressure to eliminate conditional registrations, particularly because of the fact that the majority of those registrations are neonicotinoids, the CHC believes there is a place for conditional registration if sufficient regulatory guidelines and safeguards are put in place that allow for the timely submission of data.”

While engaged in our Apimondia bid in Daejeon in 2015, the CHC agreed to be a supporter of World Bee Day on May 20th. This is a United Nations supported initiative that is designed for “Raising public awareness of the importance of bees and apicultural products has an important role in the effort to protect bees and beekeeping sector.” The Slovenian Beekeepers’ Association, with the support of the Republic of Slovenia need to be commended for leading this initiative.

The Bee Health Roundtable continues to do great work on behalf of beekeepers across the country. Not only does participation result in improvements to bee health throughout Canada, it provides the opportunity to interact with other value chain roundtables and allows for comment and input into matters such as farm labour, business data and social license. As co-chair, it is hard to overstate the importance of the roundtable and the value it brings to beekeepers on a national level.
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Today, PMRA launched a new mobile app that allows individuals to access pesticide labels that have been registered for use in Canada. This app will help homeowners, farmers, industry, as well as provincial and federal organizations look up specific details of the pest control product they are using from the convenience of their smartphone or tablet. The most up-to-date health and safety information will be right at their fingertips with this new user friendly tool.

Users will be able to save their searches as well as download product labels to their “Favourites” for access, even when they are offline. ‘Favourites’ will also auto-update whenever users access them when online. Pesticide labels can be searched based on various factors including product name and active ingredient. The directions found on pesticide labels are important as they contain detailed explanations on proper product use and what precautions should be taken to avoid injury.

Users can download the app on their mobile device using the link below. If you have any comments on the app, or suggestions for improving the app, please include them in the app’s comments section on your device’s app store.

If you have any questions, please contact the

Zahra Galehdar, MSc.  Stakholder Relations  Policy, Communications and Regulatory Affairs Directorate  Health Canada Pest Management Regulatory Agency  Zahra.galehdar@canada.ca <mailto:Zahra.galehdar@canada.ca> (613) 736-3507
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Maritimes

First I would like to thank everyone for the opportunity to represent the Maritimes on the CHC board, Representing over 700 Maritime beekeepers, some large some small but all represented. Representation in numbers means a strong organization that is able to educate and influence other organizations and government for a better beekeeping. I would like thank Paul Vautour for his work in the past as maritime representative.

Winter in the maritimes has been up and down. Last year we were covered with two feet of snow and cold temperatures at this point, today we see bare ground. Temperatures are up and it looks like an early spring, we have endured lots of wind and ice this winter, but the warm spells have given bees a chance to step out and stretch. With blueberry pollination around the corner maritime beekeepers are looking forward to opening their hives and producing strong hives for the pollination season. This being said we hope the warm temperatures persist, as April can be a cool wet month.

SHB is a large topic in the maritimes as bees from across Canada make there way to our region. Nova Scotia is allowing interprovincial bees in Cumberland county only with each hive to be inspected before loading and shipping. New Brunswick will be holding it AGM March 19 with SHB as one of the topics of concern. PEI’s AGM is in mid April with Les Eccles doing a SHB workshop. Small hive beetle has yet to be detected in our area but concerns are high with interprovincial movement. The fact that three provinces must import pollinators shows the maritimes has room for expansion. Nova Scotia is allowing interprovincial bees in Cumberland county only but the warm spells have given bees a chance to step out and stretch. With blueberry pollination around the corner maritime beekeepers are looking forward to opening their hives and producing strong hives for the pollination season. This being said we hope the warm temperatures persist, as April can be a cool wet month.

SHB has been in the Leamington area for five years now, and appears to have many beekeepers worried. My initial observation from Ontario’s experience is that we need to address locations in the West, SHB may only have one round of reproduction in much of Canada. My initial observation from Ontario’s experience is that we need to address SHB with some management modifications but have little to fear. Winter this year in Ontario has been interesting. I have been calling it the “yo-yo” season. We have seen days of near-normal temperatures with a little snow, then three or four day stretches with temperatures well above average. Rain instead of snow is often the precipitation that we have had in early March, and also warm sunny days. As a result, many beekeepers have been out checking their hives. Thus far, everything looks excellent with most reporting less than 5% winter loss. It’s still March, and too early to predict final wintering outcomes. We are hopeful that this trend continues, and that nice weather means an early start to a productive season.

I would like to take an opportunity to make a personal comment. (My attempt to address some controversy) I have done commercial canola pollination since 1998 and made some observations over the years. When neonic treatments were first applied to canola I did not see a great effect on my bees. I noted that there were perhaps a few more queen issues and a slight increase in winter losses but these observations could conceivably have been attributable to something else. It wasn’t until corn and soybean received widespread treatment that I experienced heavy winter losses and continual failure of queens throughout the season. I understand that there is a lot of debate over this subject. I believe western beekeepers, when they say they are not seeing big problems, they are excluding the effects of SHB reproduction; there is one spike in mid to late May, then again in early fall. The adult beetles are not a threat but the larvae are problematic. Queenless hives or those with drone laying queens are the greatest risk for becoming a source for SHB reproduction. Damp conditions are preferred over dry environments. Unquestionably they will survive our winters, but they are a tropical beetle and need warmer temperatures to pupate. When we consider the shorter season and the more northerly locations in the West, SHB may only have one round of reproduction in much of Canada. My initial observation from Ontario’s experience is that we need to address SHB with some management modifications but have little to fear. Winter this year in Ontario has been interesting. I have been calling it the “yo-yo” season. We have seen days of near-normal temperatures with a little snow, then three or four day stretches with temperatures well above average. Rain instead of snow is often the precipitation that we have had in early March, and also warm sunny days. As a result, many beekeepers have been out checking their hives. Thus far, everything looks excellent with most reporting less than 5% winter loss. It’s still March, and too early to predict final wintering outcomes. We are hopeful that this trend continues, and that nice weather means an early start to a productive season.

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Québec

Early winter loss results is around 5 percent, which is quite acceptable. Once spring clean-up is accomplished we should be at around 10-15 percent. My fear however rests in the fact that if the temperature doesn’t start heating up, the hives that are already outside starts to dwindle.

The wholesale and retail honey for market remains stable and honey packers are struggling to find local honey.

The prices negotiated this year for blueberry pollination is $125 for an 8-9 frame hive, $140 for a box of bees and $150 for anything stronger. I’ve even heard of prices on the $180 to $185 price range for two boxes of bees.

Ontario

Small Hive Beetle (SHB) is a hot topic of discussion in Canada and appears to have many beekeepers worried. SHB has been in the Leamington area for five years now, and Tom Congdon has not been slimed out of business. He says that if he had a choice he would rather have SHB than wax moth in terms of the damage they cause to his hives. In Ontario, Tech Transfer has discovered that there are two times through the summer season that SHB increase reproduction; there is one spike in mid to late May, then again in early fall. The adult beetles are not a threat but the larvae are problematic. Queenless hives or those with drone laying queens are the greatest risk for becoming a source for SHB reproduction. Damp conditions are preferred over dry environments. Unquestionably they will survive our winters, but they are a tropical beetle and need warmer temperatures to pupate. When we consider the shorter season and the more northerly locations in the West, SHB may only have one round of reproduction in much of Canada. My initial observation from Ontario’s experience is that we need to address SHB with some management modifications but have little to fear.

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Alberta

The season is getting underway here in Alberta. Early reports were most beekeepers were pretty happy and encouraged with what they were seeing. Winter was very mild and hives were seen with some brood in February and early March. From most reports it sounds like most hives have fairly large populations which means they will be burning through feed like crazy. Overall hive losses and condition seem to be similar to last year. However in the last couple days I’ve been hearing some reports of some higher loss numbers, still within an expected average range. The suspected cause I’ve heard sound to be queen failure, possibly higher mite levels last fall which didn’t get knocked down soon enough, and in some cases, nosema symptoms have been visible. Pollen has been seen on the bees in central and southern Alberta since the last week of March and hopefully the bees will start building again.

The honey market remains to be quiet in Alberta and the little bit I’ve heard of what had shipped recently, prices are very depressed, basically down 50% from where we were a year ago. This is very frustrating as we have started making management decisions which costs money but we realized as beekeepers there was a positive affect on the bees by investing more dollars per hive. However with current honey prices, we must sit back and ask how we can justify the input on the lower return. It’s simply not sustainable and the start to a potentially bad cycle. Honey prices drop, producers spend less on their bees and equipment, health of bees start failing due to lack of investment and we start facing higher losses. Hive numbers drop, production drops, honey prices rise and it take five years or more for us to recover economically and physically.

We have had a few calls and inquiries to CHC about how can we address these low prices. We continue watching imports and a flat consumption rate in Canada and we will continue to promote Canadian honey as a premium product. Why are US packers not interested in Canadian honey? If Canadian consumption increases, will Canadian honey be used to fill the bottless, and how can we increase Canadian consumption? These are all great question I’ve been hearing and I think as a board we will need direction from the members at some point in time to help address these concerns. Best wishes for a safe and productive season.

I just wanted to share something with the beekeeping community and take a moment to recognize a group of people. As many of you may have heard, we had 12 hives stolen last year at Nixon Honey Farm in Alberta. This news story seemed to go national very quickly and fast exceeded where we thought it would go.

Over the winter, Nixon Honey Farm was contacted by a few teachers from the Edgemont School in the city of Calgary on behalf of about 96 grade 2 students. These students were challenged with taking a look in the media and within their community about where there could be ‘be(e) a solution’. Well these grade 2 kids ended up seeing the story of the hive theft and decided they would like to do something to help Nixon Honey Farm. WOW! In early February I was invited into the school for the students to share with us what they have done. These grade 2 students over the winter did numerous jobs and chores around their homes and in their communities and ended up raising money to help recover some of the costs of the lost bees. I was so impressed. This was a group decision made by 7/8 year old kids to do something kind to help our others and to ‘be(e) a solution’.

In all these students raised about $600 and presented us with a cheque for this amount. We felt this was very generous of these kids and I explained to them that rather than just giving this money to Nixon Honey Farm, wouldn’t it be cool if this money could help out many beekeepers, not just us. And they all agreed that would be awesome. So we let them know that Nixon Honey Farm would be sending the complete amount of money on to the Canadian Bee Research Fund in order to help researchers and scientists to continue their great work to help make bees healthier.
all across Canada and even around the world! We also explained to them that there is sometimes opportunities for the money to be matched by different companies or agencies which would make their money go even further and to honor that, Nixon Honey Farm matched the donation to the Canadian Bee Research Fund. All in all, the kids were all very excited about this and I just wanted to take this opportunity to thank Mr. Anthony Tang and the other teachers and grade 2 students from the Edgemont School once again and share with the beekeeping community how a group of young children can be so thoughtful to "bee a solution" within their community.

British Columbia

Bee season has started in the lower portion of the Province, mild weather no cold season to talk about, however there has been lots of rain and more rain and rain. When the sun comes out the bees are flying, and bringing in lots of pollen.

The BCHPA had a booth at the Pac Age show in Abbotsford this year and the event went extremely well. Lots of interests from commercial growers and people looking at starting in bees. It was a three day event with lots of interest for everyone in all facets of Agriculture. I haven't got the final numbers but the pollination brochures we had printed disappeared quite quickly.

The next event we have is the Semi Annual meeting which is going to be in Kamloops on March 10th and 11th at the Holiday Inns and Suites on Tranquil Rd. The rooms are all sold out and the attendance is looking really good.

Rudi Peters from Terrace is going to White Horse to teach a bee course and to make a presentation to the Gov leaders at the same time as there is no Apiculture legislation on the books. Looking forward to bear how that goes. Rudi is also starting a course in the Terrace area for the locals.

I am really glad to see the hard work of the members of the BCHPA, Lance Cutthill and Axel Crouse is paying off. Now because I named a few individuals here, doesn't mean they were the only ones involved. There are others I just can't name them all, so if you are one of the unnamed my apologies but stand up and be counted, you're a valuable asset.

Dr. Stangaciu from Romania, Apitherapy
Erzic Stromgren Spring Management and two Queen hive.
Dr. Svenja Belaoussoff, Project Manager for CHC increase profitability hand book for using CBISQT and Bees Biosecurity Standard
Patricia Wolf Veiga National Bee Diagnostic Centre Tae Queen Health evolution of bee stock
Kerry Clark snakes and Africanized bees, teaching in Tanzania.
Dr. Marta Guarna, Queens loosing Sperm in Transit?
National Bee Health Survey, up date for B.C.
Along with a World Cafe for Strategic Planning for the future
Checking around the province, most wintering hives with 10 – 20 % losses are on the decline right now and the 15th of April is coming fast. The 15th of April? What you have on this date is what you have, if the hive is alive, it should make it and be a viable colony. Otherwise it's dead and we all know about that. So even though it looks great now, there is still a ways to go. (Don't count your chickens comes to mind)
There is a disturbing trend that seems to be coming more evident, and that is small scale beekeepers not treating for mites. Why people get involved with bees is their concern. BUT deliberately not treating a colony for mites is not just their concern but everyone's concern! One instructor has told me that sitting in front of the hive assuming the Yoga position is not a valid way of treating for mites, and I would have to agree with him. This is where I would like to dose the individuals with lice and then tell them live with it. They can not treat themselves and see how long they are willing to put up with the lice. All too often there are articles on the Garbage Net on how to keep bees with out treating, the problem with this is there are cultural controls that these people perform, which they do not classify as treating but leave this out, and lead people down the wrong path. Treatment is not an option, learn to keep bees first and then experiment, but learn before doing harm to your bees and others.

Last October at the Annual meeting, Less Echoless did a presentation on selecting Queens, and it was using a spreadsheet to do this, some of our members are really interested in this and would like very much to try it. We understand the intellectual properties issue and the fact that it's not fully developed, and we hope Ontario will share it with interested beekeepers when it's available for release.

There was a presentation at the Semi Annual Meeting from the newly formed Commercial Beekeepers of B.C. Mr. John Gibeau, did a presentation about how the commercial Beekeepers and the BCHPA could work together. The usual rhetoric was brought up about who is passing what around. The Members of the BCHPA last Fall at our AGM made it clear they did not want any movement restrictions put in place, At the Semi Ann it was reaffirmed, the association had a second chance to look at its decision and confirmed they did not want any restrictions. The usual rhetoric about opening the border to hives coming up from Washington State. Who's going to do pollination, for what price etc.? The B.C.H.P.A. can and has and will continue to represent all sizes of beekeeping operations be it small operations or large. Some individuals with large numbers of hives, think they are entitled to more votes on some or all issues, I will take this opportunity to remind all, as a citizen of Canada regardless of size or income you still only have one vote in any election, Municipal, Provincial, Federal.

The BCHPA is not about to vote for opening the Canada US border any time soon, so that's not going to change. The commercial people appear to be very upset with Alberta Agriculture, with the restrictions put in place for the movement of bees into that province from B.C. That has nothing to do with us. At the meeting Us vs Them, Jen Difer stood up and made a statement. She was a small scale beekeeper and her family didn't have to be concerned about the mortgage payment, if she was not able to move her hives. There was no opposition to that statement from anyone, No body in the BCHPA want's to see any beekeeper injured by the presents of the SHB. We still don't have any idea of what's going to happen. The motion that was passed was to have more inspections carried out and more funding to do this.

The unsaid words at this meeting would go something like this, The Commercial people can move their hives where they want, just keep in mind the rights of others not to be infested with a gift that keeps on giving. We can say a lot of things but the truth right now is we do not know what is about to happen or if it's going to happen. So let's all take a breather and roll a Players. Relax and deal with it in a calm manner.

Research Grant

honey industry continually evolves and Bee Maid Honey Limited understands the challenges and the importance of supporting bee and honey related research projects. We are pleased to announce that for 2016, after a call for research proposals, we have selected Dr. Sievenpiper and Dr. Khan from the University of Toronto to receive a research grant towards their project “The effect of honey on cardiometabolic risk in humans: A systematic review and meta-analyses”.

We look forward to learning more about the results of their study in the next year.

Scholarships

The Bee Maid Fifteenth Anniversary Scholarship was created in 2004 to commemorate the formation of Bee Maid Honey Limited in 1954. The annual Scholarship is designed to stimulate the pursuit of excellence by rewarding outstanding achievement by the children and grandchildren of Bee Maid's co-op members and staff and to assist with their post-secondary studies. Applicants were selected based on academic achievement in the previous year, evidence of community involvement and a 300-1000 word essay on a topic related to honey bees in agriculture and human food production.

The scholarship awards are testament to Bee Maid Honey’s commitment to its members and staff. The Scholarship committee is pleased to announce that the 2016 recipients are Hailey Davidson from Edmonton, Alberta and Sydney Clark from Saskatoon, Saskatchewan.

Hailey is currently in her first year, attending Concordia University in Montreal majoring in French Studies, with a goal working as a translator after graduation. Sydney is graduating from high school this spring and hopes to enter the University of Saskatchewan in the fall, with plans of studying Kinesiology.

HiveLights | May 2016 | 9
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From JCT #250 & #349 (North of Souris, MB/South of Alexander, MB) 14 Kms East on #349 Sale Site on North Side of Road Watch for signs sale day!

HIVES: • 400 +/- single brood nest colonies Will be equalized and queen checked. Treated with Oxalic acid Oct 2015.
Have not used anything but Oxalic acid and Thymoform for Varroa treatment since 2012. No AFB detected in operation in 18 yrs. All hives on 4 way pressure treated dipped pallets with screened bottom boards. A number of single hive bottoms (150) will be available for those interested in purchasing odd numbers or non palletized colonies that can be transferred / traded. Forklift loading provided for both honey supers and hives. All hives have 3/4” fir plywood with wax dipped migratory lids. Most brood nests are dove tailed, wax dipped boxes. Will be government inspected for Varroa with less than 1% expected. Will be treated with Formicillin for Nosema in early May 2016. Hives will have a mixture of Manitoba, Rican, and Hawaiian queens, 2013, 14 and 15’s.

SUPERS: • 2100 - 9 frame fully drawn honey supers 60% of the frames have a plastic foundation newer frame, (painted top bar), no metal ears, no nail ears, 99% + wood frames

EQUIPMENT: • 300 plastic queen excluders, 5 years old • 20’ rolling gravity accordion type conveyor, used as an extracting room box return • Single stack, threaded rod box elevator, with new motor and barrel switch • Wax elevator / conveyor - from press or spinner to drum height

For more information contact Will Clark 204-724-2373
willmarthoney@gmail.com

4th ANNUAL MANITOBA BEE PRODUCERS LIVE BEE AUCTION
of BRANDON, MB. - WEDNESDAY MAY 25th 5:00 PM

Since bees are being consigned from Apiarists all over Manitoba the sale will be conducted at the Fraser Auction Service Barn in Brandon, MB by video presentation. Buyers wanting to see the bees in person will need to do so prior to sale day. Seller contact information will be posted on our website so you can contact them for directions to hive yards and info about their bees.

This sale is open to consignment of live bees. We are expecting +/-1500 colonies of bees for this sale. Numbers will depend on winter losses of the consignors.

We are now taking consignments of all sizes of colonies for this sale. Singles / Doubles / Nucs

All bees must be government inspected prior to the sale and test results will be made available to prospective buyers. Inspections must be arranged with Provincial Apiarist by sellers.

CALL NOW TO DISCUSS THIS SALE OR TO CONSIGN YOUR BEES!!!

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The Horticulture and Cross Sectoral Division of the Sector Development and Analysis Directorate, Agriculture and Agri-Food Canada is pleased to present the latest report: “Statistical Overview of the Canadian Honey and Bee Industry and the Economic Contribution of Honey Bee Pollination, 2013-2014”.

The report provides a comprehensive statistical overview of the honey and bee industry. It contains tables and charts about Canadian honey production, numbers of beekeepers and bee colonies, revenue, consumption and trade statistics. The report also includes an estimate of the economic contribution of honey bee pollination to Canadian agriculture.

Some highlights from the report include:

* Honey bee colonies in Canada are at their highest numbers in decades, increasing 4% from 2013 to nearly 700,000 in 2014.
* The trade balance remained positive in 2014 despite a decrease in exports. Total Canadian honey exports decreased from $61 million in 2013 to $51 million in 2014 while imports increased from $26 million in 2013 to $32 million in 2014.
* The annual economic contribution of honey bee pollination to Canadian agriculture in 2013 is estimated to range from $3 billion to $5 billion.

The key resources used in the preparation of this document are Statistics Canada and Global Trade Atlas. The methodology used to estimate the economic contribution of honey bee pollination is based on the work of Nicholas Calderone of Cornell University.

The report will be available online shortly but in the meantime, copies can be requested by emailing us at horticultureAAFC-AAC@agr.gc.ca. Please feel free to forward this message to anyone who might be interested in reading this report. Please email us to share your comments, questions and suggestions.
The results of initial experiments are summarized below. Results were communicated broadly in oral presentations and CBRF funding for this project was acknowledged.

**First detection of European honey bee (Apis mellifera) viruses on wax comb**

**Megan J. Colwell, Robert W. Currie, Stephen F. Pernal**

**INTRODUCTION**

European honey bees (Apis mellifera) are incredibly important pollinators. However, greater than normal overwintering losses has put a strain on apiculture and honey bee health. There is no clear answer for these losses, which are likely due to a number of interacting factors. Viruses have been implicated as one of these factors.

Honey bee RNA viruses are highly prevalent in all honey bee populations, including Canada. Three of the most common viruses are black queen cell virus (BQCV), deformed wing virus (DWV), and Israeli acute paralysis virus (IAPV). Whereas honey bee virus epidemiology has been studied extensively, no previous work has examined the possibility of the presence of these viruses on the wax comb that comprises the majority of colony substrates.

**Potential implications of virus presence on comb:**
- Virus reservoir
- Transmission of viruses within & between colonies
- Interactions with microbial factors on comb

This is the first investigation of viruses on honey bee wax comb.

**OBJECTIVES**

I. To determine if honey bee viruses are detectable and quantifiable on wax comb.

II. To determine if worker bees can transfer viruses to comb.

**METHODS**

**Molecular methods:**
- TRizol reagent to wash wax samples
- Phenol-chloroform extraction of wash
- RNA extraction of supernatant (PureLink RNA Mini Kit Thermofisher Scientific)
- cDNA synthesis from RNA (Scripta Life Science Research)
- qPCR to determine viral gene copies (Applied Integrated DNA Technologies)

I. Wax comb samples were taken from 20 deadout colonies from the University of Manitoba overwintering building in April 2015, and were tested for viruses with the TRizol wash.

II. A cage study was performed with 3 treatments, 8 cages/treatment: high Varroa bees, low Varroa bees, and no bees. High and low Varroa bees were sourced from 8 colonies respectively, and 300 bees were randomly assigned to the 16 bee cages. Each cage had pieces of wax foundation (above, right) and were supplied with 50% sugar water and water ad libitum. Cages were kept in an incubator at 30°C and 75% RH for 7 days. Bees were sedated with CO2 and frozen at -80°C. Foundation samples were removed from cages and kept at -80°C until processing.

Wax samples for both objectives were tested for BQCV and IAPV.

**RESULTS**

I. Both BQCV and IAPV were detected on deadout comb. BQCV was present on 95% and IAPV on 80% of samples (n=20). Co-infections of BQCV and IAPV were present on 80% of samples. Virus gene copies were log transformed for analyses.

There was a significant difference in the amount of BQCV and IAPV on deadouts (ANOVA; df=15, p<0.0001).

There was also a significant difference in the amount of BQCV and IAPV in high Varroa and no bee treatments (ANOVA; df=21, p<0.004).

There was also a significant difference in the amount of IAPV in high Varroa versus other treatments (ANOVA; df=21, p<0.001).

II. Both BQCV and IAPV were detected on cage wax foundation.

There was a significant difference in the amount of BQCV in high Varroa and no bee treatments (ANOVA; df=21, p<0.004).

There was also a significant difference in the amount of IAPV in high Varroa versus other treatments (ANOVA; df=21, p<0.001).

**REFERENCE**


**DISCUSSION**

I. Honey bee viruses are present on deadout comb. Both viruses were highly prevalent. BQCV was present in higher amounts than BQCV, and that over time it degrades faster, eventually having lower amounts than BQCV.

It’s interesting that these two viruses are both in the same family of viruses (Dicistroviridae) yet perform so differently. It is also possible that viruses on deadout comb were introduced a different way than those introduced in this cage study.

**FUTURE WORK**

As this is the first investigation in this area, there are many points to address:
- Optimize qPCR primers for more viruses (e.g., DWV)
- Test honey bees from cage treatments
- Can we detect virus degradation?
- Are comb-viruses infective to bees?
- Can comb-viruses be controlled?

In PCR, a gene present in your sample is used as an internal control, making sure your results are reliable. Because wax has no genes, we have to develop an external standard to validate these results.

**ACKNOWLEDGEMENTS**

We would like to thank the University of Manitoba, Agriculture and Agri-Food Canada, and the Canadian Bee Research Fund for funding, as well as the following individuals for project support:

- Lisa Babey
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- Cole Robson-Hyska
- Kateryna Rychon
- Barb Shanowski
- Steve Witney
Canadian beekeepers, and readers of HiveLights, it seems, like to know how their activities inspire artists (see HiveLights, August 2015 Volume 28, issue #3 article on JoEllen Brydon). So, I am encouraged to write this second article, this time about Aganetha Dyck and her art, in what may become a continuing series.

Beekeeping in Art II: Aganetha Dyck

Bees, especially honeybees, bee’s wax, industriousness, sociality and beekeeping have inspired art for thousands and thousands of years. The aesthetic value of bees to human beings is shown by ancient cave paintings of honey gathering in Spain 8,000 year ago. Egyptian wall paintings 3,500 years old explain beekeeping and honey production. Bees, honey and wax are parts of Hindu, Buddhist, Jewish, Christian, Islamic and other religious traditions. Of course, bees symbolize human aspirations for collaboration, organization, hard work and productivity. All in all, bees seem to have been part of art since art was invented.

So also bee products. Bee’s wax is used, mixed with pigments and a huge variety of included objects, in encaustic creations. It is also used in traditional batik, in which the wax provides dye-proof areas and lines to make patterns and pictures through serially dying and re-dying while the wax is removed in hot water and reapplied on previously dyed areas.
Aganetha Dyck uses the industriousness and constructiveness of honeybees directly in her bee-collaborative art. She and the bees incorporates comb building into sculpture.

I first saw her work at the Macdonald Stewart Art Centre in Guelph in summer 1997. There, the colony, housed in a transparent room in the gallery, had access to the outdoors through a plastic pipe. The bees were building comb on and in a bridal trousseau as a living, changing, dynamic sculpture. As Aganetha knows, honeybees may build their homes in almost any enclosed, and even in open, spaces. She has used her collaborators as “guest workers” inside at least 10 art galleries.

Many of Aganetha’s intriguing pieces comprise comb built onto found objects. The amazing array of found objects she has used ranges from broken sports equipment, discarded clothing, ceramic ornaments, figurines, it seems anything that takes her fancy for fascinating forms when embellished with hexagonal patterns of comb. She has also used bees to help draw by recording their work on computer scanner tablets. Now, she has been taking the bees’ patterns of activity recorded on feeder boards used in hives. All these exemplify joint work and present to us visual forms of inter-species communication.

Aganetha is Manitoban and works with beekeepers there. In particular she acknowledges the help and encouragement of Phil Veldhuis of Starbuck, Manitoba. She is not a beekeeper herself, but like me, when first introduced to a colony, was drawn powerfully by the natural precision, energy, activity, sounds and smells from the hive. So started her conjoined interests in inter-species communication, the power of the small, and the shared vulnerability of honeybees and human beings as creators of space and as environmental architects.

Her most recent exhibition (ending on 10 January, 2015: I will go!) “Denouement: Memories of the Hive”, at the Tom Thomson Art Gallery (google: Tom Thomson Art Gallery, Aganetha Feeder Boards) in Owen Sound, Ontario reflects Aganetha’s having become highly allergic to honeybee stings. She intends to continue collaborating with honeybees and beekeepers, but staying at a respectful distance from the former!

She has an impressive record of exhibitions around the world. In 2007, Aganetha received the Canadian Governor General’s Award in Visual and Media Arts and, the year before, the Manitoba Arts Council Award of Distinction. She is a major influence in contemporary art as her many contributions attest, not just through imaginative, evocative and novel pieces, but also through her many interviews and collaborations.
Aganetha asks me to include some special thanks. So, I quote her words “the beekeeper that I worked with for over 20 years was Phil Veldhuis, Starbuck, Manitoba - he deserves a lot of credit for my success as does Dr. Mark Winston from Simon Fraser University.”

To learn more about Aganetha’s work, why she has worked with honeybees, and her plans going forward, please visit the gallery that carries her work (http://www.gibsongallery.com/artists/aganetha-dyck) and her personal website (http://www.aganethadyck.ca). A highly informative interview with Aganetha from 2011 is reported in The Mason Journal of the Toronto-based interiors design firm, Mason (http://www.mason-studio.com/journal/2011/10/interview-with-aganetha-dyck-canadian-visual-artist/).
It was my pleasure to attend the ABF convention in Jacksonville, Florida to help with the information booth that the CHC had set up in the trade show area. While it had been many years since I had been to the USA I thought that visiting with entire new bunch of smoke blowing, hive tool bending fanatics certainly there had to some fun involved.

The trade show area we were in was huge. There was every manner of bee keeping equipment manufacturer, bee books, remote sensing, extracting equipment and honey handling and packaging.

The CHC booth was located on the corner of the second row directly across from the Dadant booth. We had a tremendous amount of traffic and a lot of interest in beekeeping in Canada. The Americans loved the look of the honey samples we had on the table and it got many compliments. Discussion ranged from the varieties of honey we had in Canada and of course the varieties the Americans had. There were many questions about the use of oxalic acid as a mite control agent since oxalic has just received registration there. How much feed we give our colonies and what kind of protection are the colonies afforded for winter. Our mite levels and of course the winter loss rates.

I have noticed as we have traveled around the world that beekeepers share many things even though they are an entire continent apart of half way round the world.

The main topic of discussion seemed to be the price of honey and the unbelievable collapse of the firm honey market only months before. There was some genuine interest in the Apimondia upcoming congress.

I took the opportunity to sit in on some presentations, and I was pleasantly surprised that beekeepers and the provincial beekeeping associations and CHC have moved forward on the subject of bee health on a lot of fronts further than the Americans. Canada has taken the opportunity to work together with beekeepers and CAPA as well as the federal ministries involved, have come together for the betterment of bee health all across Canada. It made me feel good for all the work that has gone into bee health here.
CropLife Canada's BeeConnected app anonymously connects registered farmers, beekeepers and pesticide applicators – free of charge – to provide information on any pesticide application activity or beehive locations near them – all through the use of a web browser, iPhone or Android device.

“We've heard from a number of groups that communication between all parties could be improved,” said Pierre Petelle, vice-president of chemistry, CropLife Canada. “And the BeeConnected app addresses this issue with an end goal of helping prevent bees from being unintentionally exposed to pesticides.”

CropLife Canada has partnered with the Canadian Honey Council to bring the app to Canada.

“We understand the importance of the full agriculture industry working together. BeeConnected is another tool that can help improve information sharing between beekeepers, farmers and contractors to ensure bees are protected,” said Kevin Nixon, chair of the Canadian Honey Council board of directors.

Getting started is easy

Users simply visit the website or download the app from iTunes or Google Play and create an account right on their smartphone.

Farmers are then notified when a beekeeper logs a bee yard location within five kilometres of their property and beekeepers are notified when any crop activity is logged within five kilometres of their hives.

All registered information is kept confidential and users are always anonymous.

Registered users can choose to use BeeConnected's built-in messaging service to coordinate and privately share information with specific users or can broadcast their message to any relevant users registered within a five kilometre radius of their activity or hive.

Farmers, commercial applicators and beekeepers can also explore the in-app map to find any nearby activity that could affect them. But beekeepers can't see other beekeepers and farmers and pesticide applicators can't see other farmers and applicators, something Petelle says was flagged as a concern for users of existing geolocator apps.

Petelle says BeeConnected is an important tool to help farmers, commercial applicators and beekeepers protect pollinators by opening up a line of communication about agricultural activity or hive locations with their neighbours.

“Bees and pesticides are integral and complementary components of sustainable agriculture,” said Petelle. “The plant science industry is committed to ensuring both beekeeping and agriculture can co-exist and thrive and this is just one tool to help make the connection between farmers and beekeepers.”

Interested in signing up? Head to beeconnected.ca for more information and further instructions on how you can download the app.
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As winter winds begin to seep around the edges of the beeyard in Canada, do you dream of soft island breezes and luaus on a Hawaiian beach? Your dream just came true...and there’s more!

Join the Western Apicultural Society (WAS) at their Annual Conference this October 13-15, at the Ala Moana Hotel, on the end of famous Waikiki Beach in Honolulu, Hawaii. Experience Island cuisine and the gentle, laid-back Island style, mix and mingle at the Bee Buzz Social the evening before the conference begins, hear excellent speakers talk about the latest science has to offer the beekeeping industry, with plenty of time to just visit with other beekeepers from all over North America.

The conference theme is “Beekeeping in Hawaii: New Insights into Old Questions”. The distinct islands, each with their own set of pests and parasites, provide researchers with natural laboratories in which to study the effects of the mite on colony health. The work conducted in Hawaii has opened the doors to new perspectives with respect to virus evolution, varroa’s impact, and colony management.

The conference program will include professionals and students who are working on these research programs, many unique to Hawaii; a look at the effect of honey bee problems among other pollinators; and a teaching component to help elementary and high school teachers provide their students with learning opportunities related to pollinators. Workshops and tours will combine visits to tropical farms, apiaries, and the gorgeous island scenery.

For those not familiar with us, WAS is a registered non-profit, educational organization with specific interests in western North America (though we have members from all over). Created in 1977 to address the then-unmet needs of hobbyist and smaller beekeeping operations, the 2016 version of WAS continues to take care of those needs at the same time it acknowledges and remains inclusive of the commercials. New research, which is the basis of the conference and, by extension, the WAS Journal, is not exclusive to either end of the spectrum. Nor do you need to be a WAS member to join us.

Dr. Ethel Villalobos and her team look forward to sharing the cultural and biological diversity of these islands with all of you. Watch the website (www.westernapiculturalsociety.org) for more details as they become available.
CAHRC WORKING WITH CANADIAN HONEY COUNCIL TO GROW THE AGRIWORKFORCE

CAHRC is currently engaged in four research initiatives focusing on clarifying various aspects of the labour situation facing the agricultural industry. By building our labour market intelligence, evidence-based policy can be developed and the industry can create meaningful plans to Grow the AgriWorkforce.

**Canadian Agriculture and Agri-Food Workforce Action Plan (WAP)** is a comprehensive strategy which is a roadmap forward designed to address the sector’s critical and pervasive labour shortages which have been identified as the biggest business risk management issue for the industry. It is a collaborative effort developed by the Labour Task Force (LTF), comprised of industry representatives from every aspect of the agriculture and agri-food value chain. The Workforce Action Plan provides government and industry with short, medium and long-term action items focusing on:

1. Increasing the supply of labour for skilled and unskilled workers; and
2. Improving the knowledge and skills of workers in the industry.

On February 9th, CAHRC partnered with the Canadian Federation of Agriculture to offer a Virtual Farm Tour for Federal Department officials. We had excellent engagement where producers were able to communicate the work that takes place on modern agricultural operations today through videos and pictures. We had 12 LTF members presenting and 30 Department officials participating from Agriculture and Agri-Food Canada, Employment and Social Development, Immigration, Refugees and Citizenship, and Statistics Canada.

Kevin Nixon, Canadian Honey Council Chair, spoke about beekeepers recruitment efforts, the nature of the work, and the skilled workers the industry cannot afford to lose. At a side meeting, Kevin and other seasonal industries connected with the immigration Department Officials that oversee the Cumulative Duration file.

Read the article: *Let’s get to work on a Canadian agriculture and agri-food workforce action plan* (Hill Times, Nov. 9, 2015, pg 46).

[http://www.cahrc-ccrha.ca/sites/default/files/2015-11-LetsGetToWorkCdnAgWAP.pdf](http://www.cahrc-ccrha.ca/sites/default/files/2015-11-LetsGetToWorkCdnAgWAP.pdf)

To learn more about the Workforce Action Plan: [http://www.cahrc-ccrha.ca/workforce-action-plan](http://www.cahrc-ccrha.ca/workforce-action-plan)

**Labour Market Information (LMI)** is defining today’s agricultural workforce shortage and future labour trends to clarify Canada’s agricultural labour market situation and future requirements. The LMI national results will be released upcoming at the CAHRC Growing the AgriWorkforce Summit March 14 to 16. Part of this important work is research on how to reduce barriers to entry for under-represented groups such as Aboriginal people, Immigrants and Persons with Disabilities. CHARC has two pilot projects currently underway in which employment coordinators are working with employment agencies and agricultural businesses to place potential workers. Learn more: [http://www.cahrc-ccrha.ca/labour-employment/lmi-supply-demand-forecast-model](http://www.cahrc-ccrha.ca/labour-employment/lmi-supply-demand-forecast-model)

**National Agricultural Occupational Framework (NAOF)** is identifying the knowledge and skills involved in today’s modern farm operations to support employers with tools for training agricultural workers and to help agricultural colleges align their training programs to industry needs. It is an in-depth study about the core agricultural jobs and competencies involved in today’s agricultural workforce. To date, twenty National Occupational Standards (NOSs) have been developed for the pork, sheep, aquaculture, beef and poultry producers. This fall, NOSs for beekeepers were developed in collaboration with Canadian Honey Council members. Focus Group Meetings took place in:
• Edmonton, AB - November 18, 2015
• Saskatoon, SK - December 1, 2015
• Winnipeg, MB - January 12, 2016

A Competency Profiling Session also took place in Edmonton February 11, 2016 identifying the many of the “softer” skills for the four levels entry, experienced, supervisor and manager. For example, does this employee need to be able to work in a team, do they need to be adaptable.

This is important foundational research that will help the industry develop hiring and management tools that support growers in finding, training, and retaining workers. Tools will include industry-validated job descriptions, worker assessments, training requirements and resources, customizable job ads, interview guides, online learning resources, and a nation-wide job board for agricultural jobs.

“Together, CAHRC and the CHC are strengthening the agricultural workforce and creating a more sustainable future for beekeeper. These initiatives are helping us to address some of our most important issues and get our voices heard at every level of government.” -Rod Scarlett, Canadian Honey Council

Learn more: http://www.cahrc-ccrha.ca/skills-training/national-agricultural-occupational-framework-labour-market-support

**SUPPORTING THE ADVANCEMENT OF WOMEN IN AGRICULTURE (SAWA)** is examining and addressing critical barriers to advancement facing women in the agriculture industry, leading to implementation of a strategic program to support improved access to leadership opportunities for women working in agriculture. A survey examining possible barriers to women advancing to leadership roles in agriculture is currently underway.

Participate in the survey here: http://www.cahrc-ccrha.ca/Supportingwomeninagriculture

Read **Women in agriculture polled on barriers** (London Free Press, November 3, 2015):
http://www.lfpress.com/2015/11/03/women-in-agriculture-poll-on-barriers

**GROWING THE AGRIWORKFORCE: CANADIAN AGRICULTURE AND AGRIFOOD WORKFORCE SUMMIT, MARCH 14 – 16, 2016, Fairmont Winnipeg Hotel, in Winnipeg Manitoba:**
The latest LMI agricultural national research will be released and tools will be showcased with stakeholders from the entire agriculture value-chain will be participating. Industry agricultural leaders will contribute to the discussion about how we grow the AgriWorkforce. Many CNLA members are participating in the Summit which will set the course for the next steps of the Canadian Agriculture and Agri-Food Workforce Action Plan. The hotel room block runs out February 29 so register today: http://www.cahrc-ccrha.ca/growingtheagriworkforce/

**WAGES OF FARM WORKERS KEEP PACE WITH THE WAGES IN OTHER SECTORS, FARM CREDIT CANADA, OCTOBER 2, 2015**

The Canadian Agricultural Human Resource Council (CAHRC) is a national, non-profit organization focused on addressing human resource issues facing agricultural businesses across Canada. For more information visit www.cahrc-ccrha.ca

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Introduction

The current research in our lab is a response to the high mortality rates of honey bee colonies. More than one third of the honey bee colonies in Ontario and Canada died during each of the past seven winters. This mortality level has no precedent and beekeepers do not understand what is happening to their colonies and how to minimize their losses. These colony die-offs are worrisome because the annual incremental value of bees as pollinators of crops in Ontario exceeds 100 million dollars and that of all Canada exceeds one billion dollars.

Results of a study conducted by our team (Guzman-Novoa et al. 2010) suggest that bees are dying as a consequence of combined effects of several causes, being the parasites Varroa destructor and Nosema spp. two of the most damaging factors. The varroa mite was found to be associated with more than 85% of the winter mortality cases, whereas Nosema shortened the lifespan of bees, which resulted in a significant depopulation and slow growth of honey bee colonies during spring. Current methods used to control these parasites rely upon the application of synthetic medications (miticides and antibiotics). However, the continuous use of these products has led to the development of mite resistance to their active ingredients and the same could happen with the antibiotic used to control nosema disease. Additionally, the use of synthetic chemicals implies a risk of contamination of honey and other hive products with toxic residues.

Other important factors associated to bee mortality are pesticides used by both beekeepers and crop growers. Several research strategies have been followed at the Honey Bee Research Centre to better understand the effects of pesticides and parasites on bees, as well as to develop novel control methods for Varroa destructor and Nosema spp. in honey bee colonies. Research is being conducted to assess the toxicity and detrimental effects of synthetic miticides and antibiotics (used to control varroa mites and Nosema fungi) on the bee’s immune system. The same evaluations will be conducted for neonicotinoid pesticides and other insecticides used in agricultural crops that are pollinated by honey bees. These studies will increase our knowledge of why and how these products could be associated to bee mortality, but also how damaging they are to bee health. They will probably strengthen the argument about the need to minimize the use of synthetic pesticides and chemicals in hives and on crops.
Research Projects

The following are summaries of the research projects our lab was involved in during the last three years:

a). Pathogenic effects of *Nosema ceranae* and *N. apis* and alternative treatments

The microsporidium fungus *Nosema ceranae* is an obligate, intracellular parasite that has been recently discovered infecting the western honey bee, *Apis mellifera*. It was detected for the first time in Canada in 2007 and has been associated to cases of bee mortality in other countries. A study recently conducted by our team showed that *N. ceranae* is the dominant *Nosema* species in Albertan and Ontario and that the infection levels of colonies parasitized by *N. ceranae* were up to five times higher than those of colonies parasitized by *N. apis* (Emsen et al. 2016). Thus, more research on the biology of *N. ceranae* as well as on the impact it might have on *A. mellifera* is greatly needed. However, conducting studies on *N. ceranae* is not only dependent on availability of *Nosema* spores at different times of the year, but also on reliable methods for determining spore viability. One of the objectives of this project is to use cryogenics to provide a year-round source of viable *N. ceranae* spores in vitro and a differential staining procedure with fluorescent dyes to assess the viability of *Nosema* spores. Results from Janine McGowan’s MSc. thesis have shown that cryopreserving *N. ceranae* spores will facilitate studies on *nosema* disease of honey bees.

Other objectives of this project are to further investigate the pathogenic effects of *N. apis* and *N. ceranae* as well as to study the immune responses of bees infected with different *Nosema* species. One important practical aspect of these studies will be to investigate ways of increasing the expression of immune responses in bees to potentially control honey bee diseases, including *nosema* disease. We are looking at infection levels, damage at the cellular level and effects on the immune response and length of life of bees infected with *Nosema ceranae*. The immune induction experiments involve the testing of various resistance inducing agents followed by an infection challenge. Genes that are expressed in the bees as a consequence of the immune response to the parasites will be identified through gene expression techniques. These genes will be sequenced and primers will be designed to develop markers that could eventually be used in marker-assisted selection of bees that show high immunological responses to pathogens. We will also test potential immune enhancers that could eventually be used instead of synthetic chemicals to improve the natural immune response of bees against diseases and parasites.

We have established a bee molecular and pathology laboratory, which will be key for the studies proposed. We have also developed new techniques to extract the DNA from these parasites as well as methods to reliably identify *Nosema* species even from single infected bees, which is something that was difficult with previous techniques. Dr. Hamiduzzaman, a Research Associate in our molecular lab, as well as Pegah Valizadeh (Ph.D. student), and Daniel Borges (MSc. student) are fully involved in these studies. Additionally, we have had the collaboration of Dr. Paul Goodwin, an expert on gene expression studies. Preliminary results have shown that *N. ceranae* shortens the life span of honey bees by about 14-24% and shows high infectivity. Infections of millions of spores can develop in the bees' digestive tract when fed with as low as 32 spores. Additional results have shown that two microorganism proteins as well as some nutraceuticals may be promising immune activators that may contribute to inhibiting infection development of *N. ceranae* in honey bees.

b). Immune related basis of honey bee resistance to the ecto-parasitic mite Varroa destructor

The objectives of this project include measuring humoral and cellular immune responses of susceptible and resistant bees to the ecto-parasitic mite *Varroa destructor*. Bees of European (susceptible genotype) and African (resistant genotype) origin have been used to test the hypothesis that mites inoculate viruses or proteins that differentially inhibit the immune response in resistant and susceptible bees. Parallel experiments were conducted in Canada with European bees and in Mexico with Africanized bees. Bees were artificially parasitized with varroa mites, exposed to mite fluids, or simply pierced, emulating a mite bite. Samples of haemolymph (bee blood) and bees subjected to the different treatments at different times of exposure were collected to determine the number of haemoctyes (blood cells) and the expression level of immune-related genes. Results have shown that the cellular and humoral responses of bees exposed to the mites or to their fluids are inhibited in both types of bees. Gün Koleoglu, a MSc. student, worked on this project.

c). Effects of miticides and agricultural pesticides on the mite Varroa destructor, and on the health and behaviour of honey bees

Our recent study on colony mortality showed that *Varroa destructor* was the winter mortality factor number one. The application of synthetic acaricides has traditionally been the most common way of controlling this parasite. However, acaricide resistance in mite populations has become more common over time, limiting the possibilities of adequate pest management. Additionally, contamination of hive products with synthetic acaricides (especially honey and wax) poses a risk to human health. These problems associated with the use of synthetic acaricides have resulted in the need to find new and safer methods of varroa mite control. Several natural products, especially organic acids (formic and oxalic acids) and essential oils (thymol and oregano oil), have shown promising miticidal effects. We have tested more than 20 natural products for mite control in the laboratory and in field settings. Based on these findings, new formulations of thymol were developed and tested in Ontario and Alberta between 2009 and 2014 with good results. Hanan Gashout (Ph.D. student) and Nancy Bradbury (beekeeping technician) have been in charge of this part of the project.

Another part of the project is aimed at studying the effects of synthetic and natural acaricides used by beekeepers to control varroa mites as well as agricultural pesticides, particularly neonicotinoids, on honey bees. We are measuring the toxicity of these pesticides, as well as their effects on honey bee longevity, immune responses and behaviours such as hygienic, grooming, foraging and defensive behaviour. We are testing the hypothesis that these compounds are harmful to the bees and affect their health and behaviour, contributing to the phenomenon known as Colony Collapse Disorder. These experiments are being conducted by Hanan Gashout (Ph.D. student), Nuria Morfin (Ph.D. student) and David MacKay (MSc. student). So far we have some results on the toxicity of several compounds. LD50 data showed that synthetic acaricides are more toxic to bees than natural acaricides but not necessarily more effective at killing mites. Therefore, natural acaricides could be a better choice for the control of mites, but with a higher safety margin to bees than synthetic acaricides. We have also found that acaricides may affect the foraging behaviour and hygienic behaviour of bees. Among the neonicotinoid pesticides tested, imidacloprid and clothianidine have resulted extremely toxic to bees, which could in part explain some of the colony losses observed in recent years, particularly after corn or soybean is planted. Experiments on the effect of these pesticides on behaviour and on the expression of immune-related genes are currently underway.

In addition to conducting research, the Honey Bee Research Centre of the University of Guelph participates in service and extension activities, engaging different audiences, but mainly Ontario beekeepers.
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$11.35-13.00 per hour for 50 hrs. per week. Employment from March 31/2016 October 31/2016. At Waldbice Honey Farms Inc. Box 9 Group 19 RRI, East Selkirk, MB. R0E 0M0. Language is English. Minimum 1 year experience required. Duties would be to handle, feed and care for bees; help in replacement of hives and production of nuc; move hives; collect honey, maintain and drive vehi-
cles; maintain bee yard; manufacture, assemble and maintain beehive equipment; maintain and operate other apiary related equipment. Must be able to handle heavy loads, and work is physically demand-
ing. Must work well with others, as well as the ability to maintain basic production records. Report to Supervisor. Would require steel to
tool safety boots. Send resume by mail to above address or by email to philip@waldbice.com

Help Wanted: Kinistino (SK)
Baconian Bee Farm, located in Kinistino, Saskatchewan, is looking for two Apiary Workers for the 2016 crop season. The job in seasonal full-time starting no earlier than March 15, 2016 and ending no later than November 15, 2016. Primary duties include, but may not be limited to:
1. Moving colonies out of and into winter hives.
2. Feeding and medicating of colonies
3. Evaluation and development of colony strength
4. Building and repairing equipment
5. Harvesting of honey supers
6. Extracting and storing of honey
Experience is not required but would certainly be an asset. Availability to work long hours, including weekends, evenings and holidays is required. Salary starts at $11.53/hour based on experience. Ability to read and speak English would be an asset. Housing and transporta-
tion may be an option. Send all inquiries and resumes to: dionebacol15@sasktel.net. Ap-
plication deadline is March 15, 2016

For a complete list of Help Wanted go to the Canadian Honey Council website: www.honeycouncil.ca and look under Careers (Classifieds - Help Wanted).

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For Sale:
2007 Cook & Beals Spin Float Honey-Wax Separator with Electronic Drive with new sump & float switch, $11,000.00
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Contact: Bruce 204 742 3515 or west1@honey.com

For Sale:
Dakota Gunnness Model 200 Uncapper with 5 foot extraction and drip trays. In excellent condition $8900. Pick up in Edmonton, Alberta. Please contact: nohbersness@gmail.com

For Sale:
Full line of equipment to build bee houses: Multi rip saw, Finger joiner. Under car saw. Handle cutter. Shaper and Assembling jig, $1,800.00 for all of it. We also have a frame assembling machine. This machine will automatic-
ly assemble and put in plastic permanent. 720 frames an hour placed in bee boxes. $30,000.00
Contact Dave Stahl: d120@gmail.com

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4-frame over-wintered nuc for sale in May. Pick up only.
Highlands Honey, 6-Z 2 Old Kingston Rd., Portland, ON, K0G 1V0 613-271-2091 email: highlands_honey@storm.ca

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table and can be inspected for NS or NB.
I prefer to see the operation as a unit. Contact: sanderst.stan@gmail.com

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- for further information please contact: pelhoneywine@gmail.com or pelhoneywine@gmail.com*
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Contact Chris: 1-204-872-2398 or email: pilotman1977@gmail.com

Business for Sale:
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Clifton Royal, NB 508-651-5508
Lavigne.carla@gmail.com

Business for Sale, Vancouver Area (BC)
Vancouver area bee supplies/candle supplies business for sale. Established and growing. Gross revenue $25k per month. Selling due to retirement. Please email inquiries to beekeeping25@shaw.ca

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**Book Review**

Bees are a marvel of nature and vital to human existence. The Bee Book is a grand introduction to bees and beekeeping and celebrates the wonder of bees in nature, in our gardens and in the hive. A honey bee visits up to 1,000 flowers a day yet produces only 1/12th of a teaspoon of honey in its lifetime. The Bee Book offers startling insights into the lives of bees and shows how we can best support and benefit from their presence in our gardens and hives. Marvelous is the industry and intelligence of bees, the turbulent life of a queen and the remarkable properties of honey. This book includes recipes for simple home remedies and beauty treatments using honey, wax and propolis, such as a honey and clay facial mask, or a sunburn lotion.

Follow our step-by-step guides to create bee-friendly spaces such as bee ‘hotels’, read about beekeeping, harness the power of honey and guard the fairness of the bee. Available “ wherever books are sold” - Indigo / Chapters / Costco - many independent booksell-
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