Bee sCene

SPRING 2018
Volume 34 #1

Promoting and Encouraging Beekeeping
in British Columbia since 1920

BCHPA Website: www.bcbeekeepers.com

BRITISH COLUMBIA HONEY PRODUCERS' ASSOCIATION
Publications Mail Sales Agreement No.40828130

Inside:

To:

Letter from the editors . . .


unwrapping hives last spring

A couple of weeks ago Heather's mom was here for a visit. It was nice to have her here and we were able to go to the ski hill with her and the kids. Downhill skiing is a real treat as we only make it there a couple of times a year, and the kids did really well considering their limited experience. Like most kids, they enjoy dangling from the chairlift, speeding down the hill, and winding down the gullies and monkey trails. A lunch of french fries is maybe even more important to them.

Fun times aside, one thing on our list of winter chores this year was to make beeswax foundation, though we haven't made much progress on that. It's a time consuming job, and then there's wiring the frames and installing the finished sheets. We heard about a trial that took place last summer in our area, not far from where we live, which compared colonies started on standard plastic foundation with colonies started on a new product from New Zealand: man-made, fully drawn-out beeswax foundation. We are unsure about the technology used to create it, and we know little about the test that was done here. I have yet to come across any information about this product in the North American journals, but you can look up 3D printing of beeswax comb on the Internet and find a few articles.

I did not search too extensively, but the press release style article I did read mentioned that this technology is still in progress, and that the printing takes an entire day for one sheet of drawn comb. The logistics of shipping such a fragile product on a large scale make it seem daunting. Would the increase in honey production outweigh the extra cost of the comb? I don't know of any beekeeper that enjoys wiring hundreds (or thousands) of frames. Could beekeepers someday print beeswax comb at home, right in the frame? I am intrigued, but the speed of production would have to improve for this idea to become viable. As I understand it, some New Zealand beekeepers send their combs to factories for extraction, so perhaps this would ensure that they get new comb instead of someone else's diseased comb.

My dad and stepmom also came to visit this winter, and I took them out for a quick backcountry ski while they were here. It is impressive to see all these grandparents still so active - my dad is over seventy and is still backcountry skiing. During their visit he read our copy of Sue Hubbell's *A Book of Bees*. I think I preferred her book *A Country Year*, but in *A Book of Bees* she describes Langstroth's desperate life, handicapped with intense periods of depression. Not only was he confined to half a life, but his handwriting was so poor that only his wife could decipher it. Yet his contributions to beekeeping are still enduring today.

Recently we had some big snowstorms which brought a little chaos to our area, with plenty of trouble on the roads. I was passing by our new neighbour one morning and we stopped to discuss how he was going to get up his long, steep and very snow-drifted driveway to his tractor. It occurred to both of us at the same time that in this age of 4x4 trucks, tractors, ploughs, bobcats and increasing technology, our own two legs seemed to be the most reliable. I am pretty sure bees can build their own comb just fine, but I would not want to go without bee space, and luckily for my neighbour I had just cleared his driveway a few days before. As for french fries, a couple every once in a while doesn't seem to hurt.

Wishing for spring, though it seems a long way off.

~ Ian ❀

ADVERTISING AND DEADLINE INFO: BeesCene is published quarterly (February, May, August, November) by the British Columbia Honey Producers' Association (BCHPA). BCHPA represents BC beekeepers and is the voice of 100% of the managed BC honey bee colonies nationally through the Canadian Honey Council. BeesCene is delivered free of charge to all members. Non-member subscriptions are welcomed: $50/year (Canadian funds). Deadline for submissions: 15th of the month prior to publication (i.e. July 15th for the Aug. issue). A complimentary sample copy will be sent on request.

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Printer: International Web Express Inc., Coquitlam, BC

Publications Mail Sales Agreement No. 40828130
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VOLUME 34 #1
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BRITISH COLUMBIA HONEY PRODUCERS' ASSOCIATION

In This Issue

ARTICLES PUBLISHED IN BEESCENE ARE THE OPINIONS OF THE AUTHORS AND SHOULD NOT BE CONSTRUED TO BE THOSE OF THE BCHPA.

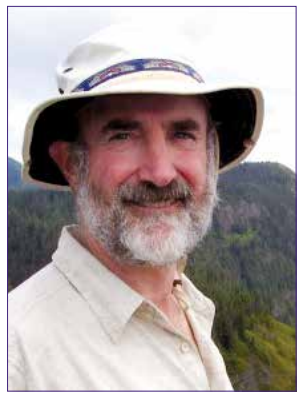
The cover photo on this issue was taken by Deanna Eskelson, from Sahtlam, BC. The bee was foraging on snowdrops in her yard last spring. She has had bees for 3 years, and is also raising 4 kids, chickens and ducks.

From the President

The Semi-Annual meeting is fast approaching, and our organizing team, led by Second Vice President Dan Mawson, is working diligently to bring another fine slate of educational presentations to the meeting in Kamloops on March 9th and 10th. Our spring meeting last year came close to having to turn away attendees, so this year we decided to search for a hotel with a larger capacity. Ian Farber, our trusted Kamloops facilitator, has come through with the Hotel 540. Check the website for details.

Even the business meeting will have some significant announcements. Enabled by the unexpected but much appreciated contribution of funding announced in the last BeesCene by Minister of Agriculture Lana Popham, our Research Committee (chaired by Heather Higo) and board have developed two projects. Together, they put our Association in the position of enabling research that may lead to an explanation for some long-term problems and bring us some solutions. Thanks to Treasurer Irene Tiampo, who will be taking on some extra administration duties that come with the extra funding. Stay tuned for details, and I hope many members will choose to help in the research. Find out more about how you can do that at the Semi-Annual meeting.

The past couple of months for me have been quite exciting: my son Sheldon with his spouse Selina had a baby girl in early December, and Connie and I are now grandparents to Thalia. Shortly after I was asked to volunteer in a beekeeping development project in Africa, and I'll be focusing on that in February, while 1st Vice President Jeff Lee will be serving in my absence. January has been a busy time working with our BCHPA team and funding partners, to carry through on concerns we've heard, and launch some useful initiatives. Look for details in this issue about a project being developed by research scientist Dr. Marta Guarna. The minutes of teleconferences and meetings leading to these Association activities are well recorded by BCHPA Secretary Christina Rozema.



Kerry Clark
BCHPA President

While the winter and spring of 2017-18 in BC has been a challenging one, with extended cold or unusually wet weather, we can all look forward to whatever may come. At least the daylight hours are noticeably increased from late December, a time for optimism. Bees be with you. ❀

Beelines

News from the Ministry of Agriculture

PAUL VAN WESTENDORP, Manager, BCMA Apiculture Program
paul.vanwestendorp@gov.bc.ca.

Apiary Inspector – New Position

In recent years, beekeepers of Northwest British Columbia have often requested inspection services similar to those services offered to beekeepers in other areas of the province. The decision to appoint an Apiary Inspector requires a number of factors for consideration. The most obvious one is the financial resource needed to support the position. It also requires a careful evaluation of how the position can deliver program extension services most effectively compared to existing program activities and services. In response to increasing requests for inspection services in the area from Prince George to Terrace, approval has been given to seek qualified applicants for the position of Apiary Inspector.

A detailed description of the position will be available on request. The key requirements for the position include extensive experience in all facets of beekeeping management, bee biology and behaviour, and knowledge of bee diseases and pests. The candidate must possess a Bee Master certificate or successfully complete the course at the earliest opportunity. The position also demands an ability to work independently with minimal supervision, excellent communication skills and to interact with clients with tact and respect. The position of Apiary Inspector is a seasonal part-time position that requires frequent travel including occasional multi-day inspection tours. To ensure optimization of resources, we are seeking candidates from the Prince George – Vanderhoof area.

If you have the qualifications or know of someone who could fill the role of Apiary Inspector, please contact me at the Apiculture Office.

Apiary Inspector – North Okanagan-Shuswap

Doug Gordon has been the Apiary Inspector of the North Okanagan - Shuswap for three years with great success. But for Doug, a part-time seasonal job is simply not enough. His own beekeeping business and his collaboration with other commercial beekeeping operations in the Okanagan have made it increasingly difficult for him to commit the time to deliver apiary extension services. So, Doug has requested us to start looking for a replacement.

The same requirements and conditions apply to this position as those listed for the Apiary Inspector's position for Northwest BC.

Spring is Coming!

Slowly but surely, the days are getting longer, and when we occasionally have clear skies, the sun entices the bees to come out for their earliest flights. It may be tempting to open the hives, but breaking the winter cluster may do more harm than good. Only on a nice sunny day with temperatures of 12°C or higher, you can pay the colonies a short visit and check on food reserves, population strength and condition. Don't spend too much time looking for brood and eggs because the sudden heat loss may result in chilled brood. The easiest way to check for food reserves is to tilt the hive slightly forward and gauge its weight. If it feels empty, provide sugar or sugar syrup. If the hive still feels heavy, leave it alone until the weather warms up and the bees have become active.

When the beekeeping season has started and the initial inspection has indicated the strength and condition of the colony, it is equally important to do your first *Varroa* test. For beekeepers with limited experience, we recommend that you test your colony (or a few randomly selected colonies in a larger apiary) for varroa mites once a month. We recommend you use the Icing Sugar Shake or the Alcohol Wash method for detection purposes. While the test may not offer a high level of accuracy, its regular application offers a clear indication of mite population trends. This simple management approach is an integral part of IPM (Integrated Pest Management) where pest control strategies are applied carefully according to need and circumstance. For details, please visit www.gov.bc.ca/apiculture and scroll down to "Bulletins".

Every Beekeeper Should be a Botanist

It has often surprised me over the years that so many beekeepers focus all their attention on the bees and how much honey they produce. A surprising number pay little attention to the seasonal availability of nectar and pollen sources of their area. Just because it is green and has flowers, it doesn't mean it is a food source for bees.

Honey bees have a huge advantage over native pollinators because they are long-distance foragers that can access food sources at great distances compared to native pollinators, most of whom are solitary species. Since honey bees are managed, the beekeeper can also move the colony to an area with nectar and pollen sources.

Studies have shown that many native pollinator populations are declining because of temporary food shortages during the summer season. There are many other factors that contribute to their decline, but shortage of food during part of the summer season severely impacts their reproductive capability and even their survival. This is not surprising because in the last 50 years or so, the North American landscape has seen drastic changes in the diversity of its vegetative cover. Many undisturbed areas with diverse vegetation are now cultivated, paved over, sprayed, mowed or altered in ways where bee forage is no longer available. Most commercial colonies can no longer be placed in 'resting areas' after crop pollination contracts where they can regain their strength by accessing diverse floral sources to meet their nutritional

needs. Beekeepers can compensate for nutritional deficiencies by providing pollen supplements and substitutes to their colonies but native pollinators don't have such a luxury as they are completely dependent on whatever local food source is available.

The Ministry of Agriculture initiated a province-wide program a couple of years ago to encourage landscapers, farmers, municipalities, public and corporate agencies, and beekeepers to support pollinator populations through the planting of bee forage. The key is to offer reliable nectar and pollen sources throughout the season. To learn more about the "Food For Bees" initiative, visit www.gov.bc.ca/foodforbees.

Beekeeping Courses

The public interest in bees and beekeeping remains unabated. Through the BCHPA training program, there are a quite a number of certified beekeeper instructors in the province. There are also various commercial operators who offer beekeeping courses in different parts of the province each year. The BC Ministry of Agriculture also continues to offer a number of courses in different formats.

In recent years, the webinar format of the course Introduction to Beekeeping has become very popular, with attendance of several hundred people. In-person, classroom instruction remains the most effective high-quality method of teaching a course in beekeeping. It is fortunate that so many courses are offered to beginner beekeepers as it will strengthen and professionalize the beekeeping industry. There is nothing better than a better educated and better trained community of beekeepers. This will secure a vibrant industry for the future!

Veterinary Antibiotics

Since the 1950s, beekeepers have used oxytetracycline (Oxytet, Terramycin) to control AFB and EFB. After beekeepers in some parts of Canada reported difficulty to control AFB with oxytet, tylosin (Tylan) was introduced. Since then, some beekeeper groups have promoted the registration of lincomycin in Canada as an additional tool in the toolbox.

While all these antibiotics have offered invaluable service to beekeepers and livestock producers, increasing incidences of antibiotic resistance among microbes that affect animal and human health has become an acute concern. Untreatable tuberculosis and MRSA in hospitals are the clearest signs that microbes keep on finding ways to resist antibiotics. At the same time, not nearly enough new antibiotic agents are being developed by the pharmaceutical industry to safeguard human health. The threat of more antibiotics losing their efficacy has caused the Canadian Food Inspection Agency in collaboration with US agencies to introduce a policy of limiting the availability, distribution and application in animal production systems. The intent of this policy is excellent but there is a major concern that beekeepers will have difficulty obtaining the same antibiotics they have used for decades, and at a much higher cost.

The proposed policy includes the requirement that beekeepers must obtain a veterinary prescription for the purchase of antibiotics. The issuance of a prescription is based on the relationship between the veterinarian and beekeeper client where it is assumed that a veterinarian is familiar and knowledgeable about the bee health situation of the beekeeper's operation. However, most veterinarians are unfamiliar with beekeeping management and the circumstances of bee brood disease. Either way, veterinarians charge a fee for the services they render. Likewise, a pharmacist will demand a fee for filling the prescription.

Commercial beekeepers may adjust to the new policy quickly but for the small hobby beekeeper, the new policy will prove difficult and costly. Many beekeepers may decide not to treat their colonies, or they may access antibiotics through the internet from sources where the origin, quality and composition of the formulations may not be known.

The federal government has imposed a deadline of December 01, 2018 for the new policy to take effect. At this time, there is still uncertainty about how the new system will work across the country. It is hopeful that an accommodating arrangement can be found. ❀

~ Paul van Westendorp
Provincial Apiculturist
British Columbia

Canadian Tech Transfer Teams for Apiculture

by Robyn McCallum

A report on existing Canadian Tech Transfer teams for Apiculture was recently prepared, to serve as a checkpoint for where we are nationally in terms of Tech Transfer, what we have in common, our challenges and successes, and future directions. This summary allowed us to determine what we had in common and brainstorm ideas and ways to collaborate across the country. It also allowed us to get to know one another better and share our goals and achievements with industry partners.

The idea for a summary was born at the recent Canadian Association of Professional Apiculturists (AGM) in Kelowna, BC in October. Different industry members were asking about Tech Transfer teams, what they were working on, and if they worked collaboratively. I wasn't aware of the structure of other teams and wanted to learn more, so I reached out to Nicolas Tremblay of the CAPA Tech Transfer Committee and jotted down some questions. The questions were circulated to the four teams: Saskatchewan, Ontario, Quebec, and Atlantic, and we collaboratively submitted our results. I pooled the responses together and as a group, we worked through the structure. Nicolas kindly translated this into French, and we approached CAPA to share this document publicly.

In my opinion, Tech Transfer teams are in a unique position to take scientific research and global beekeeping practices, make them digestible, and introduce these practices and ideas to regional beekeeping industries. From the summary, we also now know that Tech Teams are involved in designing and conducting research, have a major teaching component, and are engaged with multiple industries (e.g. beekeeping and agricultural crop pollination). Tech Transfer teams are able to address industry concerns immediately and also conduct response extension. It was enlightening for me to see that many of us are tackling very similar issues (e.g. varroa mite management) and that some teams have taken the lead on queen research. Although we are a large country, we are working on many of the same issues. The full report will be posted on the CAPA website (www.capabees.com). ❀

JOB POSTING

The Saskatchewan Beekeepers Development Commission is hiring for the position of a Research Assistant, in a project entitled: "Exploring Prebiotic and Probiotic Feed Supplements for Honeybees and their Impacts on Colony Health."

The successful contractor will be able to:
- preferably have beekeeping experience and a science background
- help with driving, managing and assessing colonies, supering/pulling honey, testing/treating for disease incl. Nosema, AFB and Varroa mites
- perform research tasks incl. data collection, recording, data management, writing and limited reporting
- process samples to detect Nosema and Varroa mites
- assist the Principal Investigator with all aspects of data collection and bee management, receive and follow directions, record and communicate activities
- assist with presentations, demonstrations, and extension of the project's activities
- have good communication skills (written and verbal)

The contract duration is 42 weeks, from April 2018–Jan 2019, and pay is based on experience/education. $18-20/hour plus applicable sales taxes, with an expected 40h/week invoiced. No benefits provided, and contractor must report their self-employment income and file sales and income taxes to the government. Contractor is responsible for travel to work site and personal safety equipment. Beekeeping equipment provided. Additional work may be available.

Send applications and resumes to:
Hannah Neil, Principal Investigator, Email: hannah.mae.neil91@gmail.com
CC Simon Lalonde, SBDC president, Email: simon@tonylalondesales.ca

BC Blueberry Council and Honey Bee Health

by Gerry McKee

Even a casual observer driving through the Fraser Valley will notice the increase in blueberry fields over the past few years, as growers replace raspberries and wild blackberry masses with rows of high-bush blueberries.

As with most agricultural commodities, a dramatic increase in production usually leads to downward prices and decreasing returns to growers. Some Supply Management Systems have enabled producers to sustain equitable returns on investments. Historically, we know farmers generally lose out in maintaining a competitive balance with packers and retailers in the marketplace. Increasing their economy of scale with heavier debt loads is often their only option.

When the BC Blueberry Council (BCBC) extended an invitation to attend their Fall Membership meeting on November 25th, I was curious to learn how growers were responding to the increasing blueberry production, as well as to find out their thoughts about some beekeepers threatening not to return to pollinate blueberry fields due to colony losses following last year's spring pollination.

At the Langley Golf and Banquet Centre, BCBC membership filled the room to capacity and were eagerly reviewing their agenda. After welcoming everyone, Chair, Jack Bates briefly updated BCBC's progress since their last spring meeting. He introduced their new CEO, Ms Anju Gill, who has a Bachelor of Arts, (Social Culture and Communications, UBC) and a Master of Arts in Political Science. She summarized the International Agricultural Summit meeting in China and the following Canadian trade mission to China. She pointed out that major challenges for BCBC will be to continue to create demand by accessing diverse markets while maintaining high quality products.

In 2017, North America produced 350 metric tons (t) of blueberries, South America 150t, Europe (Spain and Netherlands) 75t and Asia (China) 28t. Though China is rapidly increasing production, the BC Blueberry brand is highly regarded for quality, and the Chinese middle class tends to favour imports over domestic producers. For the past few years, the BCBC has been developing a marketing penetration strategy in the Chinese market and results appear promising. However, increasing competition from other exporting countries such as the United States and Australia indicate that the BCBC needs to ensure high standards, as well as developing such value-added products as blueberry wine.

On the topic of pollinators, our Provincial Apiarist, Paul van Westendorp, gave an overview of bee pollination in blueberries at the meeting. In answering a question on fungicides, Paul pointed out the need to exercise caution on any perception that pesticides could be a contributing factor as there is a need for documented evidence. He indicated that beekeepers are looking into last season's bee health problems.

Several other interesting presentations on pollinators were given. A field trial involving wildflower patches on the periphery of blueberry sites was presented by UBC student Sarah MacQueen. She indicated that there are studies showing an estimated 30% pollination deficit for blueberries in the Fraser Valley. Her project was designed to determine an optimal wildflower patch arrangement around blueberries to increase honey bee visits to the blueberry blossoms. The greatest number of bee visits occurred when the wildflowers were located at the far end of the blueberry field, relative to colony placements.

Another interesting presentation was from Dr. Ralph Cartar of the University of Calgary (another SFU grad of Dr. Mark Winston), who described his group's plans for a two year project using bumblebee nuc boxes (formerly from SFU) to establish colonies of bees for supplementing blueberry pollination in the Fraser Valley.

Following the meeting, I talked to several growers who had their own bees and who also observed distressing signs of brood die-outs last spring. They seemed to be in a bit of a quandary about it. But, BCBC's general membership and leadership were not convinced the problem was due to fungicides. Growers were apparently spraying more last spring than in previous years because of very wet conditions, but their consultant said (in my phone call to him prior to this meeting) that the chemicals have not changed from previous years.

Currently, it appears that the burden of proof is on the shoulders of beekeepers, while chemical applicators seem to escape any sense of responsibility. Indeed, a "meeting of the minds" needs critical attention as the contribution of BC Blueberries to our economy and well being is too important to be allowed to fall into any gap of mistrust and indifference.

This season's small field study sponsored by the BCHPA and BC Ministry of Agriculture will provide a better understanding of the stress factors affecting honey bees during spring pollination, and will possibly give a clearer idea of the impact of fungicides. Trials using supplementary protein patties will also be undertaken to determine the effectiveness in alleviating brood die-outs. Lab analysis will be conducted by groups of researchers at UBC, Agriculture and Agri-Food Canada, and at the National Bee Diagnostic Centre in Beaverlodge. ❀

Bees and the Environment in Public Education

by Ashley MacLeod

I have been involved in public education at the secondary level in Vancouver for a number of years, and during that time, I have frequently questioned and strategized ways in which to incorporate bee and pollinator health into the public stream of education. I am writing to share a recent innovation in public education that may be of interest to the beekeeping community. The goal of the program is to inspire environmental mindedness and bring the culture of the apiary into the day to day lives of youth in our society, and to make the experiences of beekeeping and an understanding of the importance of pollinators in our world a commonplace rather than a peripheral exception.

I have developed a specialized course to be piloted at Britannia High School in Vancouver that integrates those learning outcomes into the English Language Arts curriculum. The program is in development, but so far it will be a focused literary study in Environmental Literature with place based and experiential learning at the forefront. Approaches to learning include the study and production of a variety of environmental texts (novels, poetry, research papers, journalism, folklore and instructional texts) as well as a field study of bees, beekeeping, the culture of the apiary and sustainable systems in our community.

Through hands-on experience working with bees, students will deepen their understanding of themselves and others in relation to the environment, locally and globally. Furthermore, students will study traditional Indigenous texts that emphasize the importance of connection to the land and the environment from a First Nations perspective, and participate in a variety of workshops led by Aboriginal educators and community members. The goals of the course are geared towards increasing environmental stewardship amongst youth, in the hopes of increasing awareness about the importance of protecting pollinators and the natural world.

Two to four hives will be installed in the school's nearby community garden where students will take part in weekly hive management workshops (emphasizing safety and best practices) as well as and the study of honey bees, native bees and other pollinators. We will spend classroom time studying literature such as *Bee Time* by Mark Winston, Romantic poetry, *Letters from the Hive* by Stephen Buchmann, *A Friend of the Earth* by T.C Boyle, *Bone Gap* by Laura Ruby, *The Bee Man of Orn* by Frank Richard Stockton and a variety of philosophical and classical works about bees and their role in spirituality, agriculture and society. Students will produce a variety of creative and academic written work in response to and based on their classroom and field experiences.

The reading list is in development and this is where I am hoping to get your input. What are your favourite, most cherished books about bees? What are the most informative books about native bees and other pollinators? What do you consider to be the essential environmental works of literature, past and present? Your contributions will help to develop a diverse and varied reading list for this progressive and innovative course. Please submit your recommendations to ashleyeileenmacleod@gmail.com. I value your input, so please don't hesitate to get in touch if you have a book or other resource to share. ❀

The Lake Isle of Innisfree

by William Butler Yeats

I will arise and go now, and go to Innisfree,
And a small cabin build there, of clay and wattles made;
Nine bean-rows will I have there, a hive for the honey-bee,
And live alone in the bee-loud glade.

And I shall have some peace there, for peace comes dropping slow,
Dropping from the veils of the morning to where the cricket sings;
There midnight's all a glimmer, and noon a purple glow,
And evening full of the linnet's wings.

I will arise and go now, for always night and day
I hear lake water lapping with low sounds by the shore;
While I stand on the roadway, or on the pavements grey,
I hear it in the deep heart's core.

BCHPA Creates a Research Committee to Look at Colony Health and Blueberry Pollination

by Alison McAfee

Kerry Clark is concerned about recent complaints over honey bee colonies coming out of BC blueberry pollination in poor health. The symptoms, cited by multiple large-scale operations in BC and Alberta, include a European foulbrood (EFB)-like appearance and colony dwindling as the year goes on. With the BC blueberry crop valued at over $200 million annually, maintaining a healthy relationship between growers and beekeepers is critical.

In September of last year, Kerry struck a research committee (including Heather Higo, Liz Huxter, Gerry McKee, and myself) to begin to get to the bottom of the issue. "We saw an opportunity to sponsor some research topics so the Research Committee has been created to guide that process," Kerry explains.

It isn't clear why these symptoms are on the rise, and the incidents do not appear to be isolated. Last November I had the pleasure of attending the Entomological Society of America's annual conference held in Denver, Colorado. There, I met with Dean Polk, a fruit Integrated Pest Management coordinator at the New Jersey Agricultural Experiment Station. He specializes in blueberry and cranberry research, and more recently, honey bees. He, too, reports growing concerns from beekeepers, citing very similar reports of EFB-like symptoms and colony dwindling.

Fungicides have been blamed both in BC and New Jersey, but there is currently a lack of definitive evidence. "We monitored some commercial migratory hives during the 2015 blueberry pollination period, and again in 2016 and 2017 in both blueberries and cranberries," Polk says. Results were not conclusive though, owing to a relatively small sample size and limitations of the experimental design. Polk indicated that if there are sufficient funds, he plans on doing another experiment in the future.

Once we have a better idea of the magnitude of the problem and the underlying causes, we will be able to do something to solve it. The BCHPA research committee is working to assist with a field trial in collaboration with other research groups. Kerry explains, "We are currently helping to support a project by the National Bee Diagnostic Centre to use cutting-edge techniques to gain new perspectives on foulbrood diseases of honey bees. We are also exploring the possibility of sponsoring a related project to find answers to the growing problem of declining health of honey bee colonies used in blueberry pollination."

Indeed, very recently, a project to sponsor has been chosen. The research committee was consulted during the development of a collaborative proposal between the University of British Columbia, Agriculture and Agri-food Canada, and the National Bee Diagnostic Center, with the BCHPA supporting the project through partial funding. The proposed research should shed light on what could be causing the EFB-like symptoms and generally poor colony health, and could start to provide us with solutions.

Being completely new to the topic of blueberry pollination and EFB, one of my first questions was if colonies that are not

Alison McAfee
PhD Candidate,
Genome Sciences
and Technology
Michael Smith
Laboratories, UBC

involved in blueberry pollination are also suffering from EFB-like symptoms. I personally know at least one beekeeper who experienced similar symptoms last summer who doesn't do pollination contracts. Could there be more? If so, that suggests that the problem may not be rooted only in blueberries, but in some other environmental variable, or in the surrounding agricultural plots.

With questions like that in mind, one of our first tasks is to conduct a survey of beekeepers, especially in the lower mainland, who had extremely low representation in the last Annual Beekeeping Production survey. If you manage over 100 hives, we would like to hear from you. Wherever you

live, and whether you use your colonies for pollination, queen production, honey production, or some other task, the answers to this survey will help us identify the areas where our work can have the most meaningful impact for you and the industry as a whole.

Results from the survey will be for the sole purpose of guiding our research direction and possibly strengthening our arguments when applying for grants. Your information will remain confidential unless you tell us otherwise – at the end of the survey, you will have an opportunity to share your contact information should you wish to participate in future field trials. The survey results might confirm what we already suspect – that there is a link between blueberries and EFB-like symptoms – or they might cause us to re-evaluate what's going on.

If you can spare 10-15 minutes of your time to complete this survey, we ask that you visit the BCHPA website and click on the "BCHPA beekeeper survey" link. The survey will close on March 5th, and your participation will be valuable help for us to get to the bottom of the blueberry-bee health relationship. ❀

We invite you to participate in the BCHPA beekeeper survey

The BCHPA research committee is trying to better understand a potential link between EFB-like symptoms and blueberry pollination.

If you manage 100 hives or more, we ask that you spare 10-15 minutes of your day and fill in the online survey. Simply click on the survey link on the BCHPA website to get started.

Survey results will help us set up strategic research projects to help address & solve this issue. The survey closes on March 5th.

Thank you!

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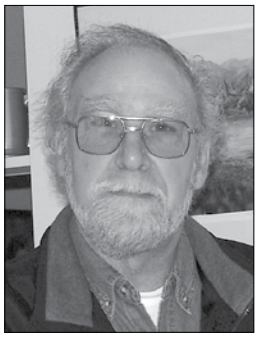


Stan Reist,
Canadian Honey Council Rep

It's that time again; I am sitting in an Ottawa hotel waiting for a flight home. We have just finished the Bee Health Round Table meetings and the CHC AGM.

Highlights from the Bee Health Roundtable include the Best Practices Manual for Bee Health which has been printed and distributed. It looks like it was well received.

The Planting Guide has also come out. This is a guide for farmers, land managers and gardeners that was produced by Pollinator Partnership Canada. The guide was commissioned for discussion purposes by Agriculture and Agri-food Canada (AAFC) on behalf of the Bee Health Round Table. It takes into consideration various areas of Canada, plants that are beneficial to bees and also for habitat. Both of the guides are available on the CHC website: http://honeycouncil.ca/canadian-bee-health-roundtable/.

We had an update from PMRA on current pesticide reviews. There are new restrictions on some chemicals, including Clothianidin and Thiamethoxam; included are some new restrictions on foliar use. Some of this is linked to the US where they grow cotton and citrus which does not affect us; however, the reviews are ongoing. The topic of tank mixes and fungicides was also discussed, along with the adjuncts like silicone that are in the mix and what effects they have. While we have discussions on these chemicals, the research and investigations are always continuing.

Dr. Steve Pernal gave an update on the Honey Bee Health Surveillance Project, sharing some results and possible future directions.

Dr. Shelley Hoover presented information on Provincial Monitoring Strategies and CAPA activities.

There has been a lot of publicity recently on adulterated honey, and it is thought to be eroding the confidence of the Canadian consumer as to the purity of the honey they are consuming. There has been a report about shipping adulterated honey into the US and in it, five countries were named as possible transshipment points. Canada is one of those countries, and there is talk of a 200% duty being applied to imports to the US. It all has to do with the price being paid for honey, and right now Canadian honey is moving into the US at a low price because the American packers are probably using the abundance of quality Canadian honey as a bargaining chip in the pursuit of cheaper honey to blend, and remain price competitive. As of this time, the AHPA is not going down that road but is looking at the three bottom countries on that list.

The Bee Health Roundtable strategic plan includes future priorities and directions, a report of honey and beekeeping issues, and the announcement of a review group on issues for potential roundtable action. There was also a review of proposals made from other working groups and an identification of consensus options.

Apomondia is quickly approaching in Montreal, in September 2019. The provinces are going to be asked what they would like to contribute to the event. We could have either pre or post tours, organize the honey competition; the list goes on, so put on your thinking caps. This can be addressed at the Semi-Annual in March.

A few years back I mentioned that we were going to lose the availability of antibiotics for the treatment of foulbrood. As of December 2018, these drugs could be available only by prescription from a veterinarian. As it stands now you will have to form a relationship with a veterinarian in order to get the drugs. To go through the process that Health Canada is proposing, which includes getting a prescription, the cost of treating a hive is likely to increase. The CHC made a presentation to Health Canada and we were promised that we would be consulted, but no consultation took place.

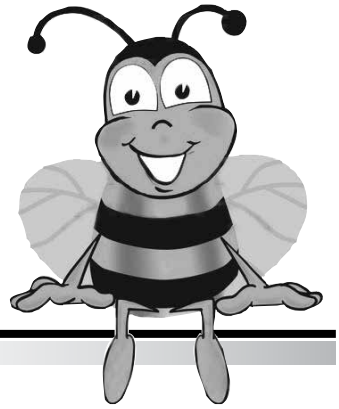
However, what you have to remember is that Oxytetracycline will not cure foulbrood; it will alleviate the symptoms temporarily but in most cases they will return. The only two methods of actually curing foulbrood are to irradiate or burn equipment. ❀

Ask the Buzzers...

This column is a place where all beekeepers are encouraged to both ask questions and give answers. It has been said that if you ask three beekeepers a question, you will get four different answers, so readers will have to take answers under careful consideration. Beekeepers are encouraged to respond to answers when their thoughts may differ.

An important thing to always keep in mind is the wide range of environmental conditions we encounter in our province. It's best to be cautious when taking advice for your bees, and to take into consideration where that advice is coming from. Always consult experienced, successful beekeepers in your area.

Please send questions and responses to the editor at BeesCene@bcbeekeepers.com.



Q: Most interesting bee-related article you've come across recently?

A: In the January 2018 issue of American Bee Journal: "An Insider's Perspective - How a Nobel Prize Influences Tomorrow's Varroa Control", by Alison McAfee. The title is not one that would have drawn my attention immediately, but once I started reading I was interested. The article explains RNAi technology at my level of understanding. It is a balanced review in my opinion, and I appreciated the author's insights into the use of miticides as a top down interim solution while we develop lasting bottom up solutions to *Varroa*.

~ Barry Clark, Prince George

A: I am a big fan of Doug Sponsler at Penn State. I thought his recent paper in Bee World that he wrote with Reed Johnson on thinking about pesticide exposure to honey bee colonies is really clever, because everyone thinks that exposure is equivalent to the toxicity of a pesticide and it is not. The paper really thinks through how a highly social bee species, like honey bees, in some sense can absorb the shock of certain pesticides, because they are primarily transferred through nectar, but are more vulnerable to something like pesticides that accumulate in pollen. Dr. Sponslor is doing an amazing job of thinking how pesticides might actually get into a colony and cause damage. That is a missing piece, particularly in many studies when you set up a scenario when these field realistic conditions are not present. Sponsler, D.B. and Johnson, R.M., 2017. Poisoning a Society: A Superorganism Perspective on Honey Bee Toxicology. Bee World, 94(1), pp.30-32.

~ Andony Melathopoulos, Oregon

A: Three articles or parts of them on *Nosema* and treating prophylactically with fumagillin. These are not the most recent articles but taken together show that American beekeepers and breeders may want to breed for *Nosema* resistance rather than treat with fumagillin.

1. In this paper, the researchers found that spore production by *Nosema ceranae*, an emerging microsporidian pathogen in honey bees, increased in response to declining fumagillin concentrations, up to 100% higher than that of infected bees that have not been exposed to fumagillin. Huang, W-F., Solter, L.F., Yau, P.M., Imai, B.S., 2013. *Nosema ceranae* Escapes Fumagillin Control in Honey Bees. PLoS Pathog 9(3): e1003185. Doi:10.1371/

2. The high degree of individual variation in level of infection of *Nosema cerenae* within a colony suggests that some degree of genetic resistance to *N. ceranae* infections may exist among managed honey bee colonies. Bourgeois, A.L., Rinderer, T.E., Sylvester, H.A., Holloway, B.A., 2011. Patriline variation of *Nosema ceranae* levels in Russian and Italian honey bees. Cold Spring Harbor Meeting. 17.

3. American Bee Journal, February 2008, "Breeding Around the World" by Kirsten Traynor.

~ Liz Huxter, Grand Forks

A: Neumann, P. and Blacquière, T., 2016. The Darwin cure for apiculture? Natural selection and managed honey bee health. Evolutionary Applications, 10(3), pp.1-5. The article addresses changing attitudes on how we should be dealing with varroa mites.

Tom Seeley has a good number of research articles that are well worth reading or if you would rather watch as videos go to: http://www.honeyshow.co.uk/lecture-videos.php, where there are a few good lectures on his bee research.

~ Garret Wilkinson, Parksville

A: John Harding Queen Rearing in *BeesCene*, in the summer

2017 issue. The Harding thing is something I'll probably try myself, it's totally different from other approaches.

~ Peter Christie, Dawson Creek

A: I was very interested in a lecture by Nancy Moran on "The Evolution and Function of Gut Communities in Social Bees", which has led me to a number of other articles on this topic. A recent article, "Honey Bees, Antibiotics and Gut Microbia" by Rebecca Novak Tibbit in Bee Culture (http://www.beeculture.com/honey-bees-antibiotics-gut-microbia/), references Nancy's work with Kasie Raymann out of the University of Texas. Head to Nancy Moran's website (http://web.biosci.utexas.edu/moran/), lots of info there.

~ Julia Common, Vancouver

A: Tom Seeley's study on the benefits for feral honey bee nests of smaller size and regular swarming. Goes against the popular human belief that bigger is better. Loftus JC, Smith ML, Seeley TD (2016). How Honey Bee Colonies Survive in the Wild: Testing the Importance of Small Nests and Frequent Swarming. PLoS ONE 11(3): e0150362. doi:10.1371/

~ Bruce Little, Vancouver

A: Geldmann, J., González-Varo, J.P., 2018. Conserving honey bees does not help wildlife. Science 359(6374): pp392-393. The following is a quote from the paper: "But managed honey bees are a means, not an end, and strategies to ensure sufficient crop pollination need to take account of potential competition with native wild pollinators. This necessitates a better assessment of when, where, and in what densities honey bees are required to ensure effective pollination of mass-flowering crops without harming wild native pollinators or plants. Such assessments must explicitly account for the contributions of native wild pollinators, which may be responsible for as much as 50% of the needed pollination services."

The quote ties in with the following: In 2005, Lora Morandin published a study comparing wild bee abundance and seed production in conventional, organic and genetically engineered canola. Morandin found the highest amount of pollination in organic fields and the least in GE fields. Lora did her PhD with Mark Winston at SFU. She is now working in Victoria.

~ Steve Mitchell, Duncan

A: Special issue on honey, published by the Journal of Apicultural Research (2018): 57(1) pp1-4. "The world market for honey is predicted to reach 2.4 million tons by 2022, and it is thought that much of this growth has been due to the perception of honey as a natural product free from the problems of obesity associated with other sources of sugar." This article also discusses the increasing trend to fake honey.

There is an article about Eva Crane's 1966 visit to Canada which I found very interesting, called "Canadian Bee Journey". Visit evacranetrust.org, and there is a publication index with many of her articles available, listed by date. I happened to attend the field day in Pitt Meadows she described in this article. I'm also quite moved by the description of the reception she received in Dawson Creek, as well as the fact that the highway south was not yet paved. What a journey she had.

~ Kerry Clark, Dawson Creek

A: The worldwide importance of honey bees as pollinators in natural habitats: Keng-Lou James Hung, Jennifer M. Kingston, Matthias Albrecht, David A. Holway, Joshua R. Kohn. Published 10 January 2018. DOI: 10.1098/rspb.2017.2140. "Our take home message is that while it's important for us to continue to research how we can improve the health of managed honey bee colonies for agricultural success, we need to further understand how this cosmopolitan and highly successful species impacts the ecology and evolutionary dynamics of plant and pollinator species in natural ecosystems," - Keng-Lou James Hung.

As beekeepers we have an interest and role in conservation. I see this as collaborative, not adversarial. Honey bees are potentially the canaries in the coal mine that alert us to environmental worries.

~ Diane Dunaway, Soda Creek

Q: What is the best way to deal with skunks in the bee yard?

A: Skunks have just recently started to show up in the Prince George area. Beekeeping friends in Alberta use carpet tack strips (those thin pieces of wood with nails protruding through) along the front entrance of the hive. This makes it painful for the skunk to scratch the entrance and lure the bees outside.

A fellow beekeeper up the road from me set out a live trap last summer to catch a skunk visiting his hives. It worked but wasn't a pleasant experience for him. So far the skunks haven't found my bee yard.

~ Barry Clark

A: Skunks used to have plenty of den areas and lots of natural food but times have changed. Frequently as humans encroach on wild lands, skunks are found denning under houses and sheds in suburban areas and foraging in lawns and gardens. If skunks find colonies of honey bees they will target their favourite food, honey bees and larvae.

Telltale signs of a skunk are digging marks in front of the hive, a musky odour in the air and scratch marks on the hive. At night the animal will tap and scratch the hive causing the guard bees to emerge, which they then catch and eat. Given time, they can decimate a colony. They eat more adult bees than larvae, usually only encountering larvae after they have bothered the bees so much that brood on the outer edge of the colony have become chilled and die. After bees haul out the larvae, the skunk will feed opportunistically. It's not a common event though.

For some people there may be a certain satisfaction in shooting at or killing skunks but to most this is a pointless, usually illegal and cruel exercise. The Canadian Pest Management Regulatory Agency has not approved chemicals

for killing skunks because the poison used to lace bait-eggs is toxic to other animals and ultimately birds of prey who may feed on the carcasses.

Trapping and relocation is an option but this requires expert handling to prevent the nauseating smell of skunk spray permeating your vehicle, clothing and skin. Also where there is one skunk bothering a hive, there are more ready to step up to replace the lost family member.

The best method of control is exclusion. An electric fence around the apiary works well provided that the battery is good and the long grass or vegetation is regularly trimmed from touching the wires. However, skunks can easily dig under a fence. Many beekeepers lay wire mesh under the electric fence and connect it to the circuit. This gives the animal a jolt through their paws and they leave.

Some beekeepers use a nail board laid in front of the hive as a deterrent. The problem is that it is also a hazard for kids, dogs and forgetful beekeepers. Another technique used in New Brunswick is to lay discarded heavy white plastic from covered hay bales (3 mm polyethylene) in front of the hive. Beekeepers say that skunks do not like to walk on the crackly sounding material and will avoid those hives.

One beekeeper told me his best solution was when he stopped killing coyotes. That's definitely another option to consider. *~ Heather Clay, Vernon*

A: For a hobbyist, the best thing is to get the colony off the ground a few feet using cinder blocks. In areas with deep snow during the winter, this solution wouldn't necessarily work. Most people I know experience the worst of their skunk damage in the spring and summer. Living in Western Oregon, I no longer think about snow ;) *~ Andony M.*

A: Predator fence, stucco wire over entrance, hot pepper powder at entrance in order of preference. *~ Liz Huxter*

A: Keep hives off the ground (pallets, cinder blocks), use chicken wire cylinders (2-3ft. high) that are easily placed and removed. *~ Steve Mitchell*

A: For an individual hive: a 2 inch mesh screen box to prevent them from scratching at the entrance. *~ Kerry Clark*

A: Weight on the outer cover, an elevated hive (exposes belly for stinging) and they are not climbers, chicken wire over the entrances and carpet tack strips in front of the hive. *~ Bruce Little*

A: We elevate the hives and use upper entrances. We also lay down chicken wire which the skunks do not like to walk upon. The combination of upper entrance AND no place to stand comfortably works to deter them. *~ Julia Common*

A: As a temporary solution that helped a little, I have tried leaning a queen excluder across the entrance, but it doesn't protect the sides. *~ Heather Higo, Langley*

Q: When is it safe to go into a hive to make a winter feeding?

A: Well, if you need to feed your colonies in the winter, they are already in trouble. In our area (Prince George) it's cold in winter and opening the hive when it is below 5°C is not the best. If your bees are starving though, you have to do something or they will die anyway. I put on a slab of fondant in the fall, then when it has warmed up above 0, I take a peek through the feed hole or under the inner cover. If the fondant is almost gone, I quickly lift the lid, and put another one on. This is the best of a bad situation. Some folks use dry sugar; I've never tried that. *~ Barry Clark*

A: Anytime that it is really necessary. Place a capped frame of last year's honey between the first and second frames in the top super that is covered with bees, if possible. Or place dry sugar on top of paper on top of the inner cover that has a hole in it. Or place a plastic bag of fondant with a big cut in it over the inner cover hole, cut side down. The latter might be easier to do if the weather is really cold. *~ Joe Lomond*

A: We try to leave enough honey reserves but if we need to feed, we do so in the late summer to early fall. If you have left plenty of honey reserves and still find that you need to feed mid-winter due to low honey stores, find bee/queen sources acclimated to your local winter conditions - bees who winter on low stores. *~ Liz Huxter*

A: When willow starts blooming is a safe bet. Best to always feed heavy in the fall and to sleep easy when February rolls around. *~ Andony M.*

A: While breaking cluster isn't recommended, sometimes this is weighed against probable starvation. In the Central Interior, we often have Chinook-like breaks with warmer winter temperatures. The beginning of one of these extended breaks is a good time to top-up food stores. *~ Diane Dunaway*

A: Personally I prefer opening at below zero when the bees are tightly clustered, the trick is in and out in a couple of seconds to place a candy block over the cluster, or dry sugar inside whatever type of top feeder/inner cover you use. The bees settle down quickly, just like when you have a bad dream at night and get back to sleep right away. Wet feed generally doesn't start on the coast until about third week of March, because of humidity. So any intrusion with the colony before then will be brief. In closing, it's safe anytime except if there is rain or snow, just be fast. Better a disturbed colony than a starved colony. *~ Sol Nowitz, Nanaimo*

A: If you have planned ahead and prepped the hive so that placing a sugar block or raw sugar does not expose the bees to the elements, it can be done at any time, but not during storms of rain and wind! *~ Julia Common*

A: This depends. If the bees are going to starve, anytime is the right time to prevent starvation. A hungry bee will become a dead bee, irrelevant of the weather. If the bees have sufficient

winter stores, then there is no need to go in during the winter. The correct time for winter feeding is in September. The safe time for winter feeding is any time the bees need to be fed.
~ Gerry Rozema

A: For outdoor hives, we use entrance feeders in the early spring, before breaking the covers. Once we unwrap, I typically use top feeders. We don't feed indoor colonies until moving them outside. *~ Peter Christie, Dawson Creek*

A: I guess the hungrier they are the safer it is. Heavy fall feeding is good in so many ways. Keeps them from starving and keeps up morale, provides insulation, gives them the means to build up in the early spring when they are ready. They don't waste it. *~ Steve Clifford*

A: It should not be necessary. If you go into winter with a new proven queen reared in June, and provide proper feed to required wintering weight starting in late August and finishing by October 1, you do not need to look into the hive until April.
~ Bill Ruzicka, Kelowna

A: Winter feeding? Resolve to do it before October. Or, in late winter (early March?): remove only the inner cover and observe the top bars to see where the cluster is. If the cluster has moved to one wall, abandoning honey on the opposite wall, gently remove a frame(s) of honey and move to contact the cluster (perhaps to the outer-wall position). *~ Kerry Clark*

Q: What's the best way to establish if a colony is still alive without disturbing it too much in winter?

A: Around this time of year (January/February), I try to clean out the dead bees at the bottom of the hive with a long tool to reach in and pull the dead bees out (on warm days). If they are still in the bottom box, guard bees will come to see what's going on. I also peek under the inner cover when I'm checking the bees, and you can hear the hum and often see the bees that have moved up.

Several members of our bee club use a stethoscope to listen for the bees, one member has an infrared camera that works pretty well, and I've even heard of people using a scope inserted in the hive through the top or bottom to take a look. However, I have been caught thinking a hive was dead and when I started pulling it apart to move it out of the bee yard, there they were content in the bottom brood box, quietly in their cluster. *~ Barry Clark*

A: Pick a dry day above 5°C and open the lid. Being alive is one question, but you won't know if it's a going concern unless you pop the chassis. *~ Andony M.*

A: Listen to the hive. Give a few quick knocks on the wood box and listen for their very quiet buzzing. *~ Liz Huxter*

A: Take the cover off and feel for warmth on top of the inner cover, gently tap the supers with your hive tool and then listen, or blow into the hive and listen for humming. *~ Joe Lomond*

A: In the North, we're pretty much committed once we put the bees into winter. For outside colonies, there is activity at the upper entrance during warmer days if the colony is alive.
~ Peter Christie

A: The simplest and cheapest way is to put your ear against the hive. In snowy regions, often there's melted snow around the apiary where the bees give off heat. If you're using inner

covers with a hole, you can blow down into the colony. The carbon dioxide attracts the bees, and they'll crawl up to you. If money's no object, smart phones have thermal detection apps.
~ Diane Dunaway

A: A light tap on the brood chamber usually elicits a buzz from the colony. If your inner cover has a cut out in the center, lift the lid gently, depending on temperature you may see the top of the cluster. If your inner cover has a top entrance, peek in. Once again, depending on temperature, you may see bees moving around.

If you feel like spending $300 or so a Flir device on a smart phone will give you a heat signature showing you the cluster, and could come in handy for other jobs around your property such as locating water lines. The only issue at the moment is that smart phone device does not have a replaceable battery.

A sure sign that your colony has succumbed is a greasy, waxy build-up at colony entrances. On a nice day you may think the colony is alive, when in fact it is bees from other colonies robbing the honey out. This travel results in the greasy build up. *~ Sol Nowitz*

A: I think one of the best ways is to get yourself an Infra Red camera (mine is a small gizmo that hooks up to your smart phone). Not only does it tell you if the bees are alive but it also tells you exactly where they are in the box and the relative size of the cluster. It's almost a game changer.
~ Chris Boulanger, Kelowna

A: Love this one. Go out with a 2 foot chunk of garden hose, put one end in the vent hole and blow into the other end. Now place the end you've blown in close to your ear. Works like a charm. *~ Steve Clifford*

A: I wait until the latter half of winter because I see no advantage in going into a colony when I can take no action. Sometimes the bees cluster off to the side and in the past, I might have been certain the colony was dead but upon opening up the hive, had been relieved to find the bees alive. Meanwhile I would have exposed them to the cold for no reason save to make me feel better. *~ Julia Common*

A: The easiest way for me to see if a colony is alive is to pull the top insulation back and look down into the inner cover hole. Mostly the colonies are left alone until sometime in March other than checking on the bear fencing or other disturbances. *~ Garret Wilkinson*

A: Be patient and wait for above freezing temperatures, when bees will usually come to the entrance if you reach in with a twig to clear the dead bees. Ear, wineglass, or stethoscope to listen at the entrance. Try it on a known live hive.
~ Kerry Clark

A: On a nice day with flying weather, look if they going for cleansing flights. Do not bother the bees, they know what they are doing. *~ Bill Ruzicka*

Q: Should I feed pollen supplement in the spring, and if so, when?

A: This is a complex question. I think it is a good idea to feed pollen supplement in the spring, but timing is everything. There are pollen patties which contain a percentage of pollen, then there are pollen substitutes which contain no pollen at all. I use Global Patties with 15% pollen in the spring.

Pollen supplements will stimulate brood rearing, thus timing is critical. In our climate if I stimulate the bees to grow a larger brood nest than they can keep warm the hive dies. We lose more colonies in March through April in the North, than during the winter's coldest months. A factor is, the daytime temperatures will be in the double digits +0 and nights will be double digits below zero! There are many causes for colony death but one in my opinion is that the brood nest was too big for the colony to keep warm and they died trying.

Feeding pollen patties gives your colony that extra boost to grow in advance of the nectar flows that are coming. You want a large and vibrant colony when the nectar flow starts, but if you start to soon it can backfire. I haven't really answered the question but hopefully I've given you some things to think about. ~ *Barry Clark*

A: I would start in February if I was in the Lower Mainland to rev the colonies up in advance of the first pollen flows, which I would imagine would start in March. Maybe that is a little early. But I like to get my colonies good and strong so I can start making nucs in April. *~ Andony M.*

A: I usually don't. It's a personal decision. There is the old "8 week prior to your big spring pollen flow theory" of pollen patty brood laying stimulation: 3 weeks to be born, 3 weeks to become foragers and 2 weeks to build up numbers. Why do I not? Like most, my beekeeping philosophy has evolved over the years and I tend to minimize my intrusion and introduction of products into the hive unless necessary. Why would I? A cold, wet spring when natural pollen is available but unattainable because of the weather.
~ Bruce Little

A: We usually feed pollen during the last part of February at a time when the bees are also bringing it in. We all know the delicate balance in the colony during spring - stimulate too early and there is the risk of too much brood and too few adults to keep the brood warm.

Wet and cold spring weather can prevent the bees from flying for pollen or nectar from flowing and you have the perfect storm for disease caused by nutritional stress. Of course the next layer of intrigue if you are pollinating blueberries is: will the bees be ready in time for the contracts?

We find that there are no longer any set dates in our calendar - we have the weather app on our cell phones and constantly refer to that, and we stay in close contact with our grower as he keeps his eye on the berries. Once we start to feed, we continue until there is a natural flow or until they are not drawing out comb. Also, we keep the bees wrapped and insulated until the temperature fluctuations between day and night even out. *~ Julia Common*

A: If you are not interested in advancing their build-up by feeding pollen patties, wait for good spring weather. If you want to stimulate early brood production, suggest feeding pollen patties three weeks before the usual first good pollen flow in your area. *~ Liz Huxter*

A: If you plan on splitting your hive, you should start feeding a pollen patty in mid-March along with mite treatment (strips), and if the hive is light, feed dry sugar or fondant.

~ Joe Lomond

A: I do not. If you feed in August/September, you can watch bees bringing in pollen and putting it under the feed. In my case there is too much and it results in spotty brood, because the queen cannot lay in cells still filled with pollen.

~ Bill Ruzicka

A: Location, weather conditions and what we use our bees for play a role in pollen supplement feeding. Many will place pollen supplements on in my area of Vancouver Island (Parksville) around the beginning of March. With decent and fairly consistent flying conditions I find that my bees will collect more than enough pollen to meet their needs. If the start of natural pollen collection is coupled with bouts of poor weather, it is best practice to supply the bees with a supplement until they are flying regularly and they no longer consume the supplement. *~ Garret Wilkinson*

A: Never believed in pollen patties, old school I guess. I do like putting out Bee Pro and letting them rob it. If they want to rob it that tells me it must be doing them some good.

~ Steve Clifford

A: After you know your area and your colonies, and only if necessary. I'm in a high pollen area, so wouldn't consider feeding pollen except to a colony that was short of pollen in fall, or otherwise (being split, etc). If your area has little pollen or poor pollen, try supplementing SOME colonies and see if it helps. *~ Kerry Clark*

A: A pollen supplement will provide a flush of protein within the colony to simulate a pollen flow and encourage brood rearing. On the coast you can start feeding pollen as early as mid-February. *~ Heather Higo*

A: Our area is rich in pollen-bearing sources. Unless one needs early bees for pollination or early nucs and splits, then I don't recommend artificially building-up populations. Let your bees align themselves with the rhythm of the seasons.

~ Diane Dunaway

A: It's been standard practice for many decades to feed pollen supplement in late winter, for the logical reason that it boosts colony populations to take advantage of spring honey flows, and also for pollination rentals. Spring supplement feeding does indeed create more bees. There are two issues though. The first being that beekeepers need to be effective at controlling swarming, since the higher populations will be associated with a higher likelihood of spring swarming. The second issue is more problematic, and that is that there are recent studies indicating that workers fed pollen supplement have somewhat diminished immune systems and pesticide detoxification ability due to the inferior quality of that food compared to pollen.

So it's a tradeoff: more bees, yes, but each bee might be a bit weaker, more susceptible to disease and pesticides. This is an important area for research, and at this point it's more beekeeper judgment than data, but for those having particularly difficult disease and pest issues, they might want to try not feeding supplement and see what happens.

~ Mark Winston, Vancouver

A: Speaking strictly for coastal regions I have not found it necessary to use pollen supplements. Occasionally due to ongoing rain in the buildup period pollen stores can drop to very low levels, so adding supplementary pollen can only be a good thing. In general, I would say it is not necessary however each geographical area is different so you have to act accordingly. *~ Sol Nowitz*

Adventures of a Treatment Free Beekeeper

by Leroy Harder

I was interested in insects at a young age. When I was seven, I turned up a stone and found ants frantically scrambling, grabbing exposed eggs and taking them to safety. Since that time, during the spring and summer, I would get into ant hills, find some queens and workers, put them in jars with some dirt and watch them establish a new nest.

When I was 12 or so, our family went to visit some friends on a rural property in Alberta. The husband kept bees, and while we were there he did a hive inspection. I hung around as he opened them up and pulled some frames; I was completely drawn in. He almost put some bees on our 20 acre property with the idea that I would learn to keep them, but a neighbour complained and my first beekeeping experience was delayed.

In the meantime, I still kept ants. Then I grew up, finished high school and a couple of years at bible school, went traveling, and had some adventures working on fish farms and fishing off the west coast of Vancouver Island. After that I went back to school, getting a biology degree at UBC with a concentration in insect and plant ecology, but I also had an interest in evolution and mathematical modelling. I have done lots of reading in complexity theory, which is basically math that explores complex system behaviour from simple rules, and self organization of dynamic systems with lots of components. It's not THE math that describes biological systems, but rather the type of math that could describe some of the system behaviour we see. Remember those arguments about the low probability of the evolution of life? Throw those arguments out the window as they use the wrong type of math.

I then completed (barely) a Masters of Pest Management at SFU. I was never all that interested in controlling pests; I was more interested in the philosophical implications of pest management and our relationship with the rest of living things. I think it was around this time that *Varroa* was becoming an issue. At the time I was saddened that a completely preventable problem could cause so much damage. I had read case study after case study about the massive economic harm done by moving biological material around, and the loss of long term competitive advantage for short term gain. I was curious about the long term impacts of the varroa mite, whether bees could adapt, and if they could, how long it would take. Since I take a chemical-free approach to most things, I didn't think I would ever be able to take up beekeeping.

Eventually I ended up in Kamloops. I have been experimenting with aspects of sustainable living, which for me includes having a large urban garden and putting lots of insulation in my house. In my reading, I came across some reports of bees being able to live without treatments. I became interested in bees again and I started doing lots of research. It is amazing how many bee seminars one can attend in a short period of time thanks to the Internet. During this time I became familiar with the work of both Michael Bush and Michael Palmer. Michael Bush seemed to me to have the most respect for the ecology of bees, their hive associates, and tapping into the adaptive ability of biological systems. Michael Palmer gave me the methodology of how to get lots of colonies from survivors.

Nuc site near Kamloops.

The idea of having some bees around expanded to an ambitious goal of developing a local bee that could survive without treatments. It was completely presumptuous, but nobody else was doing it, or I would have simply bought a nuc from them. I had a table saw and cutoff saw from my home renovations, and I made all my boxes and frames from scrap material. I was also planning on foundationless comb. I was expecting to lose some bees and wanted to save money on equipment.

This is side by side queens set up in a square Dadant box. The two queens in this hive barely survived the winter as overwintered nucs. I shook in some nurse bees, put them in this setup, and you can see that they took off.

In the spring of 2012, I went in search of some bees. Ideally, I wanted a locally raised, overwintered nuc, and I hoped to find one from a treatment free beekeeper. I was also open to feral bees if I could find them. I wasn't able to find such a colony, but I was able to find a local beekeeper who sold spring nucs with imported Hawaiian queens.

Since I had no better choice at the time I purchased one, and it turned out to be a good decision. The beekeeper I bought it from (Ed Zurawell) was a stroke of luck for me, and helped me along a great deal. He also mentioned that Joe Lomond, a veteran local beekeeper, was going to bring in some Saskatraz queens to try. The Saskatraz project

isn't treatment free, but they take varroa mites seriously, so I ordered 4 queens. They weren't direct from Saskatchewan either, rather they were hybrids from California, but it was the best I could afford. Shortly after I asked for them, Ed showed up with a queen cell from one of his hives that was swarming. We set the cell up with some bees and waited. Meanwhile, I got a hold of Joe to see if my queens had arrived and they were waiting for me, but some scrambling was done to set up nuc boxes for them.

I then did a split on my own for the first time, dividing up the brood nest of my original colony into 5 colonies, leaving some with the original queen. I put the Saskatraz queens in them, waited for 3 days, then took the corks out of the cages - but they were the wrong corks. I accidentally direct introduced my first set of queens, realizing my mistake after I released the last queen. Ten days later I checked, expecting disaster, and was 4 for 4 in the introduction. More good luck. There is some benefit to introducing queens to weaker nucs, because they accept queens readily.

I spent the rest of that summer looking into the hives far too often, and making a couple of splits of the original queen just to get a couple more queens going before fall. I got 2 more nucs with puny queens for my efforts, but the education was worth it.

That first fall I went into winter with 8 nucs in 2 five frame medium boxes, with about 80 frames of foundationless comb in all, and almost all worker comb. Four were Saskatraz queens, one was locally raised, and there was the original Hawaiian queen and 2 of her daughters. I thoroughly fed them in the fall (narrowly avoiding a robbing frenzy in the process), grouped them together, insulated with rigid foam, and waited to see if I would have bees in the spring. It wasn't a difficult winter and there was plenty of snow.

First attempt at queen rearing, with queens made using the cut cell method. There were so many bees in the box that the weight pulled some of the strips off the bar. Made some nice cells, though.

Adding a queen cell to a nuc.

Early in December, one of the daughter queen nucs came out during a cold spell and killed themselves in the snow. That wasn't a good sign. However, during the next warm weather in February, I had 6 nucs with vigorous cleansing flights. They all made it to spring in spite of too much interference by me. I had 6 out of 8 survive their first winter, treatment free. However, I nearly killed two hives by moving them across the yard too early in the spring. They lost their foragers and became targets for robbing. I consolidated them into a 2 queen system and gradually built them up by adding brood. One was strong enough to take care of the added brood, but the other wasn't. So I switched the boxes up to give the weaker hive additional foragers. I had just got them built up when one of the puny queens got superceded; I got a couple nice queens out of that. I also got a swarm that year which made really wonky comb.

That second season I made 26 nucs, mostly with emergency queens, and some with queens from Pederson Apiaries in Saskatchewan. I cobbled them together for the winter at a new site near Heffley Creek. I went into winter with these nucs and 6 standard hives at home. That winter was hard on the nucs. I had moisture problems due to inadequate protection. Some were started too late, but I ended up with 12 surviving nucs and 3 of 5 hives surviving their 2nd winter. The swarm also survived.

Foundationless comb.

It was that year that I happened upon Dr. Leonard Foster's work. I emailed him explaining what I was doing with treatment free beekeeping and asked if he was interested in doing some work with my bees. It just so happened that he was doing an extensive survey and his team was sampling bees, tracking colonies and measuring their traits in southern BC. He was asking for volunteer apiaries to sample bees from, and said I could be a volunteer. In theory, my bees were at the very beginning of the transition to mite resistance and there was (still is) tremendous uncertainty. Some say that it takes about 10 years to develop resistance in most locations. However, I thought information from an experiment like mine might be useful.

To my surprise, Leonard took me up on my offer, and a

At the Heffley Creek yard with the UBC crew.

seasoned crew of very experienced beekeepers came and exposed my beekeeping ignorance. In the process they discovered that they can do hygienic tests with foundationless comb. They also discovered that my bees were pretty hygienic, reasonably gentle and not hugely productive (they were building lots of comb). My bees also produced some mites, with fall counts ranging from 0 to 10 percent. The 0 reading was a bit misleading - a small colony infested with chalkbrood that happened to be really good at surviving without my doing anything.

In that season (my third), I made about 40 nucs, about half from 2 year old survivors, and the other half from promising 1 year survivors. It wasn't just the Saskatraz bees that were able to survive, but the local swarm queen I got also did very well. This may indicate that some resistance has developed locally and provided some hope for success.

That 3rd winter was difficult with many cold snaps. I had less than 50 percent survival of my big colonies, with not many quality clusters (or so I thought) in spring. There are Russsian genetics in my bees, and some small clusters do very well once spring kicks in. However, my nucs did better with about 60 percent survival, with many nice clusters. I also had a few very nice 2 year survivors.

Near the end of that winter I had a visit from some very experienced beekeepers (including Leonard Foster, Michael Palmer, Liz Huxter and Heather Higo), come to look at my bees and tally the losses during the March Semi-Annual meeting. The losses were high and discouraging (really not that discouraging), but Leonard mentioned that the data was quite valuable. The hives were dismantled and weighed in spite of cold temperatures and snow on the ground, as a final measurement of that cohort of bees. All of the living hives survived into the spring.

I did have a small adventure around that time. I was installing ant proof stands to my pallets at one site as there were lots of aggressive red ants there. The colonies were on pallets, and needed to be jacked up to install the ant proofing. On my last pallet, with one side of ant proofing installed, I was jacking up the other side. My pry bar slipped, and one nuc which was sitting precariously, went tumbling. I had a veil and work gloves, but no suit. I decided to quickly stack them back up. I got stung lots on the wrists, and had to sit down for 15 minutes or so before I finished the job.

I ended up with 35 production hives as the spring ended. Interestingly, one of the queens (not part of the study group), survived her 3rd winter with a strong cluster. As a lark we measured her hygienic capabilities the year before and she was very mediocre; I'm not sure what her secret was. However, I am not yet marking queens, so there is a possibility that some have superceded. Again I made queens from the strongest 2nd and 3rd year survivors (and they were strong). I sold a few nucs for the first time, and had the inspector come by to check on things. Mite counts were back down to the 0 - 1.5 % range in late spring.

Things were looking really good last May, and extremely strong nectar flows helped. Early nucs filled everything with nectar and swarmed. I was also replacing queens with chalkbrood problems and experimenting with side by side 2 queen systems. Then July came and everything came to a grinding halt. It became extremely dry with many smoke filled days. I tried to raise nucs, but many remained marginal. I lost a lot of strong nucs to skunks, and lost 3 strong nucs to bears - one at an urban location and another when I lost the grounding of the electric fence at my bee yard. Robbing pressure was intense and I was lucky if I had 20 strong nucs going into this winter. My big hives looked good, with about 10 percent with marginal clusters going into winter and most not requiring feeding. Mites weren't my biggest problem this year, though I'm sure the added stress from the dry conditions and robbing pressure probably added to some elevated mite levels in some hives. Unfortunately, mite levels were not measured in the fall last year.

So far this winter has been relatively mild. I have given all my hives more insulation after listening to the talk from Rudi Peters at the Semi-Annual last spring. I'm particularly interested in conserving food stores through spring. If the bees don't have to work as hard and build more strongly in the spring then they are further ahead.

There are some questions in my head about how much I am affecting selection for wintering, but maybe one thing at a time. My nucs aren't in very good condition, but it looks like my 2nd year hives are doing well. Considering the conditions last summer, I am doing about as well as can be expected.

Meanwhile Joe Lomond told me what I could have done about the skunks (hand slapping head). I could have raised the colonies off the ground. I didn't know the potential for serious impact or I would have been more proactive when I first detected the problem. Dr. Foster is still interested in my bees and it looks like they will be under more scientific scrutiny in the coming seasons. Even if I fail in keeping bees treatment free, it looks like the beekeeping community may learn a few things in the process and that's a good thing.

Last summer I had some other visitors come to help with the bees - my two nephews from Norway. About a week prior, I had placed a couple of foundationless frames with eggs and young larvae from a strong 2 year survivor into a queenless hive. During their visit, I checked the queenless hive and found that they had made lots of nice queen cells. Leaving one frame for the queenless hive, I brought one frame home with me to make some mating nucs. I wasn't really prepared, so I went through some established nucs and found donor frames of brood and bees to put into boxes for the queen cells. My nephews Aksel and Elias took the frames and transferred them into new boxes for me. Aksel, the younger brother, took the first shift (I had one extra veil). It was hot out and they had no pants, so he did it in shorts. He got about halfway through

(10 cells), and finally got stung on the leg. He was very brave about it, and even held onto the frame he was carrying. Then it was Elias' turn. He politely asked if there were any pants that he could borrow. I had a pair of sweat pants that just fit him and he finished the job without incident. My sister says they still talk about the day with the bees.

Keeping bees using ecological principles and not getting in the way of bee population adaptation is a broad subject that I would like to write more about. Somehow the subject of treatment free beekeeping gets reduced to the subject of "mite bombs". This does a great disservice to the broader scientific principles at play. I have had mite bombs, but not so many. One of my strongest hives last spring had mite levels in the fall of 8 to 10 percent for instance but surviving bees shrug them off and have low mite levels in the spring. This is pretty consistent with the observations of other successful treatment free beekeepers who count mites.

Getting help with the bees from my young nephews.

Dr. Kefuss in France has selected bees that destroy mites brought into hives from other sources. He calls them "mite black holes." Mites go in and don't come out. He uses treatment free bees as a base of his selection and has to bring in mite susceptible lines of bees so he has mites to work with. Most of my clusters that die, die in the winter. Hives that dwindle in the fall are in the 10 percent range so far. I haven't implemented robbing screens yet, but that may be a part of my beekeeping in the future to reduce drift and neighbour concerns. There also may be subtle intra-apiary disease dynamics that may benefit.

Overall, considering all the issues, I would argue that

Inspiring an early fascination.

mite bombs are probably an overblown issue compared to other issues. At the very least, thrown swarms from bees without resistance are far more likely to create mite-ridden unmanaged colonies, that can cause trouble with elevated levels of potentially new viruses to the system if the bees came from somewhere outside the local system. There are over 100 beekeepers in my local bee club. Imagine if they all throw a swarm. New pathogens and unadapted foreign bee genetics in the local system are far bigger concerns in my mind.

There is also the need for beekeepers and the beekeeping industry to take responsibility and bring mite/virus resistant genetics into their apiaries. This is the broadest form of protection against near neighbour interactions. New beekeepers should have mite resistant bees as a first step. Even with incompetent treatment and swarm management, they have a chance to succeed, and the overall level of sick hives is reduced.

I don't do anything to reduce mite levels as I want to identify bees that do well on their own. That requires not interfering with the system beyond managing for honey and raising queens and nucs. If a queen doesn't do well, I don't want her. Nor does nature. It's a process that goes on continually under our noses for all living things. Once a baseline for survival is achieved, then more selection by the beekeeper is possible. In future articles I would like to explore why treatment free is perhaps the gold standard for selection at present.

In conclusion, I would like to say that in spite of my inexperience as a beekeeper, I have had some success in spite of the mistakes that I continue to make. My apiary continues to grow using Michael Palmer's methods to replace bees that don't survive. It seems like my bees are improving in terms of vigour, and there will be more strong 2nd year survivors to raise queens from this coming spring. I am setting sites up so my queens and drones will interact more with each other to tip the odds in my favour. There is still some trepidation. Some treatment free keepers experience significant losses more than once on the road to stability. It makes me wonder what experienced beekeepers with more resources could accomplish if they were committed to the idea of developing local mite and virus resistant stocks. ❀

Urban Beekeeping Perspectives

by Allen Garr

I began beekeeping on my back deck on the west side of Vancouver over 20 years ago, quite by accident. A University buddy who was a beekeeper asked me if I wanted to keep bees and I said, no! He asked a second time and got the same answer. Then one morning he rapped on my door and said he had just picked up a swarm on my side of town, and it was now on my deck. Urban beekeeping at that time was illegal, however, which somehow made it more appealing - kind of like having a grow-op (but not).

It would be impossible to say just how many beekeepers there are now in the Lower Mainland of BC. Despite requirements to register bee yards with the provincial apiarist, not all beekeepers do so. There are also plenty that do not belong to any bee club, but of course many do. In fact there are no fewer than eight bee clubs between Chilliwack to the east, and Bowen Island and Squamish on the coast.

What can be said with certainty is this: ever since the city of Vancouver legalized beekeeping on residential properties in 2006, the number of beekeepers here has exploded. Beekeeping was legalized in New Westminster before '06, but it was the Vancouver regulations that provided the trigger and the template for other municipalities to follow, and they quickly did – you can now keep bees legally in Burnaby, Richmond, Delta and North Vancouver City. Many more municipalities have created bee-friendly legislation since.

Generally speaking, bylaws allow for folks to keep two hives on an average city lot, which in Vancouver runs between 35 and 50 feet wide and about 120 feet long (New Westminster allows you to have two nucs in addition to that). In Vancouver, you are either required to have fences that are six feet high, or have the hives up on a deck that is eight feet in the air. This is to give the bees an upper flight path so that they don't bump into your neighbours when they're coming and going.

You can imagine that there is an inherent problem with this restriction on hive numbers. If one of your methods of avoiding swarms involves doing splits, you have to find another yard or, perhaps better still, find someone to buy the split.

Since the bylaws are complaint driven, most beekeepers understand that cooperation with each other and with the public helps prevent problems. Education and communication are key. Often, beekeepers are committed to providing the municipality with lists of beekeepers to pick up swarms. You can go on the Vancouver city website if you have a swarm and find a beekeeper in your area who will help you out. The Richmond Beekeepers Association also has a swarm list.

As part of the deal to get the municipality to approve urban beekeeping, beekeepers usually offer to self-police in order to deal with anyone who create problems in the community by exceeding the allowed number of hives.

One more thing. You may be able to get away with a grumpy or "hot" queen and her progeny out in the countryside. Neither visitors and their children coming to my hives at UBC or the VanDusen Botanical Gardens, nor my partner planting peas in her vegetable patch, have much patience if they are getting stung or even just bothered a little by temperamental bees.

At a recent seminar held by the relatively new Burnaby club, all 40 people in attendance were keeping bees on small city lots. At the Richmond club's Annual General Meeting in January, 80 percent of those in attendance reported only keeping bees in the city.

Another trend is apparent. 20 years ago, virtually all beekeepers were men. If women were at club meetings back then, they were there with their partners. If they were there on their own, it was likely, with few exceptions, that their partner had died and left them the bees. The Richmond Club membership was a couple of dozen in those early years. This year there are more than 130, and that is only exceeded in this province – I believe – by the membership of the Victoria club.

At the Richmond AGM this year, half of the people in the room were women. One more thing to note about trends: the colour of beekeepers is changing along with the general population of the Lower Mainland, which has steadily been growing in diversity. I am also coming across more and more urban beekeepers who like trying out different styles of hives than just the standard Langstroth or Dadant 10 frame. We are seeing more folks with top bar hives and Warre hives, and the odd person who is willing to lay out about $600 has one of the flow or "self-harvesting" hives.

Provincial Apiarist Paul van Westendorp says one measure of this explosion of interest in urban beekeeping is the high attendance seen on the free beekeeping webinar offered by the Government of BC. Where he was once able to satisfy the number of folks wanting to learn about beekeeping by having actual classes at one of the colleges in Fraser Valley, he has now turned to the Internet to meet the demand. When I last checked, over 500 folks had signed up for the online course across BC, and Paul confidently states that the vast majority are hobbyists who live in cities.

Back in the day, beekeepers had big enough operations to arrange the purchase of equipment and bees from wholesalers, or from the Bee Maid co-operative in Alberta. Hobbyists relied on JJ Bee supplies in Cloverdale. Now there are at least a half dozen businesses that service the Lower Mainland urban beekeeper, offering everything from equipment to imported packages in the early spring, to queens and nucs later in the season. As well, a number provide beekeeping courses on various levels, some with BCHPA Certified Instructors.

So the question that's raised is this: Is this explosion of beekeeping activity in the city actually good?

The best thing about the growing number of urban beekeepers is that they are part of a wave of people in cities that have helped to raise awareness of the role of pollinators and the degradation of habitat for both domestic and native bees. At the same time as beekeeping in cities has grown, so too has the number of public gardens used to grow vegetables. The previous generation that went back to the land by moving out of the city has been replaced by a generation that wants to work the land, but closer to an urban centre.

This raised awareness is having an impact. In Vancouver for example, the city was easily convinced to ban the use of neonicotinoids as a lawn drench to eliminate chaffer beetle grubs. (Those grubs were a source of food for everything from crows to raccoons which regularly destroyed lawns as they searched for these tiny snacks, but the neonicotinoids were worse).

Another positive development is a group calling itself the Environmental Youth Alliance, which is promoting the spread of mason bee hives and helping to build "pollination corridors", encouraging people to plant flowers and replace lawns with bee friendly vegetation.

But bear in mind that this activity has accelerated after the arrival of *Varroa* and incursions of the Small Hive Beetle, and after a time when a common treatment for American foulbrood was just to burn equipment (try that in the city) and there was, apparently, only one type of *Nosema*.

As a result, today's beekeepers in general require more skills and knowledge to maintain their hives in a healthy state than previous generations. And there are indeed more classes and more information provided at bee club meetings than I found when I started beekeeping a couple of decades ago.

Yet for the growing number of folks in cities who want to keep bees, dare I say it is too often more of a fashion statement than a serious pursuit that requires a more elevated level of education and attention than in the past. Some, I suppose, will figure that out.

And that is where I would say there is a downside. New beekeepers are failing regularly, and abandoning their interest within a year or two. This is particularly the case if they pursue practices that can be described as "treatment free", which too often means doing nothing at all. They aren't so much beekeepers as bee watchers, and that could lead to the spread of diseases in adjacent hives where more conventional practices are being employed.

Unlike driving a car, owning a bee hive requires no lessons and no license. One can only hope that the growing number of folks profiting from selling bees and equipment will be equally determined to encourage their customers to spend the very few dollars it costs to join a bee club and to learn before they leap. Or better still, if their goal is more about saving the planet and helping the bees than it is about managing livestock, people should be encouraged to plant bee friendly flowers instead and we would all be better off.

By the way, I lost that first hive back in 1994. Mites. I didn't have a clue. I was also advised I didn't need to wire the frames in my honey super and when I attempted to extract my first crop in a two frame hand crank extractor, I blew out most of the frames. Very soon after that I started reading a few books about beekeeping and joined a club. Then I took the Beemasters course at SFU. And I still make mistakes. But then, beekeeping in any environment can be challenging. ❀

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Semi-Annual Education Day Speakers

Leonard Foster - UBC Research Update

Dr. Leonard Foster is a Professor in the Department of Biochemistry and Molecular Biology at the University of British Columbia (UBC). Dr. Foster comes from a family of beekeepers and got his introduction to academic bee research at Simon Fraser University while doing his Bachelor's degree in biochemistry – at SFU he worked with Drs. Winston and Slessor on honey bee pheromones, particularly the components of queen mandibular pheromone. He then did a Ph.D in Toronto a post-doctoral studies in Denmark before starting his current position in 2005.

The first independent operating grant that Dr. Foster secured was to study how bee pathogens were able to manipulate the protein machinery within bee cells. Since that time he has led two very large-scale projects that have investigated some of the molecular mechanisms behind disease resistance in bees. This effort has recently moved into trying to apply this knowledge by using the information they have learned to guide selective breeding for hygienic behavior in honey bees. He is very active in extension and frequently engages the public on various aspects of honey bee biology.

Heather Higo - Overwintering Banked Queens - Research Project Update

Heather began working with honey bees in 1987 at SFU and completed a Master's degree in bee research under Mark Winston. She then took on the position of SFU bee research coordinator, managing the University's honey bee colonies and bee research lab and mentoring students. When the lab closed, Heather began running a small queen rearing operation in Langley and continued in the bee community, giving talks and teaching queen rearing and IPM workshops in the Fraser Valley, while also working in Plant Health for the Canadian Food Inspection Agency. In 2011, CFIA assigned her to work on the Bee IPM Project with UBC and Agriculture Canada to improve honey bee mite and disease resistance through breeding and testing.

After a short time back at CFIA, in 2015 Heather returned to bee research with UBC as the BC Field Manager for the Marker Selection and Beeomics projects, where she led a team in sampling and testing colonies throughout BC as part of a five-province effort to develop new technological tools to enhance our breeding selection capabilities and improve the bee industry. Heather is currently working for UBC on the Beeomics and other research projects, in addition to raising her own queens.

Carlos Castillo - National Honey Bee Health Project Update

Carlos received his bachelor's degree in Agriculture at the National Agrarian University - La Molina in Lima, Peru in 1991, then joined the National Institute of Agricultural Research (INIA) working with horticultural crops. Following this, he traveled to Japan for his postgraduate studies at Kobe University in Biotechnology and Molecular Biology, working on molecular aspects of self-incompatibility plants, obtaining his doctoral degree in 2003. He and his family arrived in Canada and settled down in Vancouver in 2006. Before joining GPRC as the Applied Scientist Manager of the National Bee Diagnostic Centre, in February 2012, he worked for four years with honey bees at Simon Fraser University, doing research on pheromones.

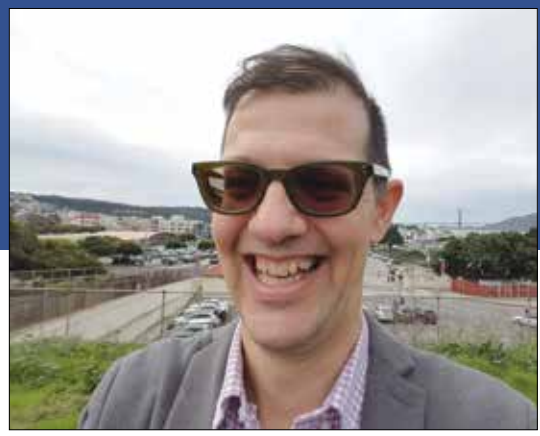
Bill Stagg - Building a Sustainable Small Scale Apiary

Bill and his wife Larissa own and operate Sweetacre Apiaries in Tappen, a small commercial beekeeping operation located in the Shuswap Lake region of BC. Running nearly 300 hives, they specialize in raising quality local honey bee stock, selling both mated queens and nucleus colonies, as well as honey, pollen and pollination services; they also process their own beeswax for candles. From the beginning they wanted to build an apiary that was not reliant upon imported stock. Grafting and raising queens is back-friendly, and satisfies an itch to get up close and intimate with the bees. Bill also worked as a provincial bee inspector for several years.

Bill enjoys sharing his knowledge, and gives workshops and presentations in BC and Alberta. Each spring at their farm, the Stagg's host a beginner beekeeping course, and throughout their time on their acreage they have taught and shared their experiences with hundreds of people both in and out of the province and country. He looks forward to sharing some of his goals, accomplishments and mistakes, and will give you a tour of what a year at Sweetacre Apiaries looks like.

Semi-Annual Keynote Speaker

Andony Melathopolous
Assistant Professor
Pollinator Health Extension
Oregon State University



I began working with honey bees in the early 1990s and the bulk of my experience has been in apiculture – native bees and other managed bee species came later. I took Dr. Mark Winston's advanced undergraduate course at SFU in honey bees, the last time it was offered. I think I might have been Mark's worst student ever, but I had a lot of enthusiasm! I remember the first day of class, Mark asked if anyone had ever seen a honey bee colony and I eagerly raised my hand up. He asked where I had seen it, I explained, and he pointed out that wasn't a honey bee colony but a weather station.

I squeaked my way into the Winston Lab as an undergraduate worker and had the opportunity to work with the Dream Team – Jeff Pettis was the postdoc, Tanya Pankiw was the PhD student, Heather Higo was the lab technician, Danielle Downey was my lab mate, and Leonard Foster was there as an undergrad as well. Steve Mitchell, who also worked for Mark at one point, was the first person to take me into a bee yard. And there was Mark, who was creative and thought provoking.

I owe most of who I am to Mark's generosity in getting his students to talk to beekeepers; I fondly remember talking to all the Vancouver bee clubs. I did my MSc with Mark, and he also sent me to the Alberta, Saskatchewan and Manitoba bee meetings with now retired USDA scientist Bill Wilson. Bill, but also Mark, taught me how to communicate science with regular people; I consider myself less a scientist than an extension person. I became interested in native bees after working for a decade in Beaverlodge with the wonderful Steve Pernal. Steve is another great science communicator and I really loved working with the commercial beekeepers in Alberta. I learned so much.

I was inspired to go back to school after the intense public interest in honey bees started after 2006. I worked under Steve Javorek in Kentville, Nova Scotia – who is a really remarkable native bee person working with AAFC. There were a lot of people interested in the causes of honey bee losses, but no one was thinking about what the social dimensions were. My PhD research was part economics, part sociology and part agronomy. I was really curious, for example, in the exaggerated claims of economic value attributable to the activities of honey bees in food production. I had the good fortune to work in a cropping system that had a lot of activity from native bees, namely lowbush blueberry in PEI. I have been keen to know more about native bees ever since. I often wonder: why do we justify the preservation of song birds just because they are cool, but bees have to be justified in terms of food production? I think we underestimate the public - they would be blown away by the amazing bees living in BC.

I am now involved in the Oregon Bee Project, which is an initiative that links the Oregon State University Extension Service with the Oregon Department of Agriculture and the Oregon Department of Forestry. It includes public outreach, new honey bee diagnostic services, a more comprehensive approach to responding to pesticide poisoning incidents, a statewide survey of native bees and a big push to train land managers, pesticide applicators and the public on how to help bees. My part focuses on pesticide education; I teach over 1500 pesticide applicators a year on safe pest management around bees. I also run a weekly podcast, PolliNation, where I talk to people who are doing innovative things to help bees.

A part of the Oregon Bee Project I am very proud of are the Bee Protection Protocols. The Protocols come out of a process where Grower Commissions sit down with the Oregon State Beekeepers Association to work out a set of standard practices to avoid problems during the busy growing season. The key to the success of these protocols is facilitating discussion, where key areas of concern are put on the table and addressed. Often times, growers have a difficult pest problem around bloom and not a lot of options for control, in which case the beekeepers are given a clearer picture of the grower's constraints and can figure out the least problematic approach for everyone.

In return for participation from grower groups, we work to let the public know the strides the industry is taking to improve pollinator health. We see this initiative as a way to generate better communication and to make sure growers that go the extra distance get recognition. Growers have an amazing amount of knowledge and they are extremely innovative. They need to know what to do. Communication in advance of a problem is key. ❀

Andony will be giving three talks at the Semi-Annual Education Day:

1. Doing the Multiplication: Expanding your Apiary the Old School and the "Next Generation" way (covers installing packages, splitting and making nucs)
2. Unsung Bee Diseases and How to Manage Them (European foulbrood, chalkbrood, viruses, *Nosema*. Tracheal mites and small hive beetle)
3. How to Talk to Growers about Pesticides (sharing his experience dealing with blueberry farmers and insights into the current blueberry issues)

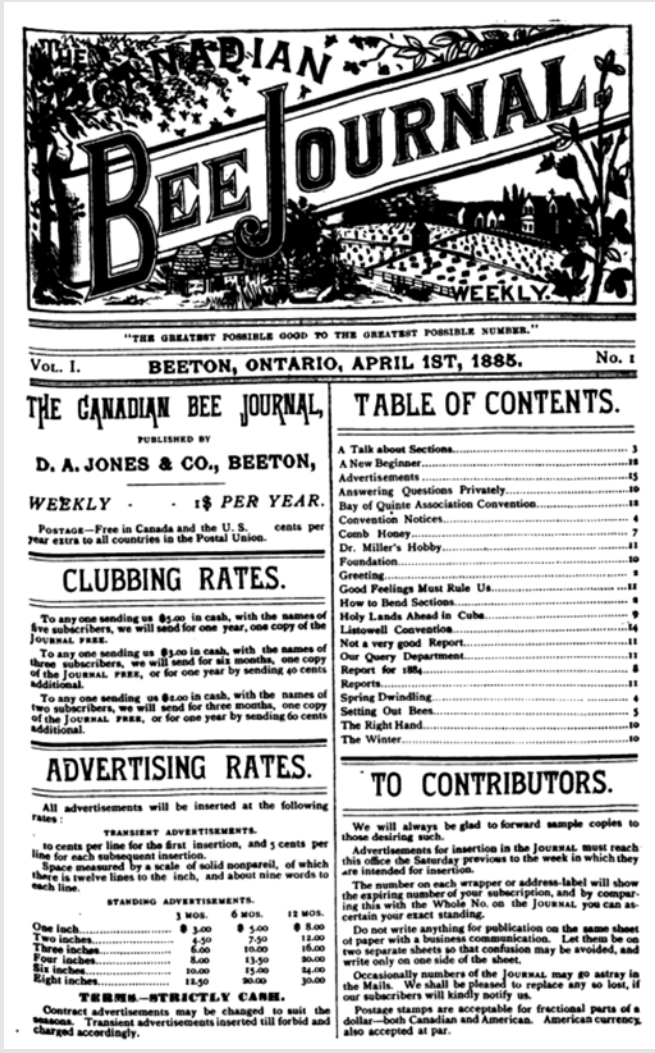
He will also be on the panel for the Blueberry Pollination Roundtable discussion.

CLIPS FROM THE PAST

Presented here is the cover of the first issue of The Canadian Bee Journal which was published on April 1st, 1885. I don't know the full extent of this journal's publications, but old issues from 1885 to 1913 can be found online. The latest reference I could find was 1974. The language in the first issue is quite Victorian and that shouldn't be a surprise - Queen Victoria had another 16 years left of her reign. In further context of the time: Sir John A. MacDonald was halfway through his second term as Prime Minister, and it was 35 years before the BCHPA was formed.

The journal was published by D.A. Jones who was likely the first large commercial beekeeper in Ontario, with 1000 colonies by 1890. The original name of Jones' community was Clarkesville, but was renamed Beeton in recognition of his thriving industry, which included the manufacture of beehives. There is a connection with the famed F.W. Jones of Bedford, Quebec but this author is uncertain of the exact relationship.

While some things are similar to today, one that is quite different is that they seem to encourage subscribers to send cash! (Dealing in cash only - anybody identify with that?) There is a section entitled "Queries and Replies" and it is much like "Ask the Buzzers" of this journal. One question asks when is the best time for "setting out bees". It is clear that the practice at the time was to winter bees in a cellar "or some suitable repository". Some emphasize that timing is important to avoid "swarming out" and by that, what is meant is absconding. Most advise setting the bees out when pollen is available - many advise when specific blossoms appear: maple, willow or apple. Some are guided by daytime temperature reaching 65 Fahrenheit (20°C). Some advise setting out temporarily for a cleansing flight, then returning the colonies to their winter enclosure.



THE CANADIAN BEE JOURNAL.

WEEKLY.

"THE GREATEST POSSIBLE GOOD TO THE GREATEST POSSIBLE NUMBER."

VOL. I. BEETON, ONTARIO, APRIL 1ST, 1885. No. 1

THE CANADIAN BEE JOURNAL,
PUBLISHED BY
D. A. JONES & CO., BEETON,
WEEKLY - - 1$ PER YEAR.

POSTAGE—Free in Canada and the U. S. cents per year extra to all countries in the Postal Union.

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Contract advertisements may be changed to suit the seasons. Transient advertisements inserted till forbid and charged accordingly.

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TO CONTRIBUTORS.

We will always be glad to forward sample copies to those desiring such.

Advertisements for insertion in the JOURNAL must reach this office the Saturday previous to the week in which they are intended for insertion.

The number on each wrapper or address-label will show the expiring number of your subscription, and by comparing this with the Whole No. on the JOURNAL you can ascertain your exact standing.

Do not write anything for publication on the same sheet of paper with a business communication. Let them be on two separate sheets so that confusion may be avoided, and write only on one side of the sheet.

Occasionally numbers of the JOURNAL may go astray in the Mails. We shall be pleased to replace any so lost, if our subscribers will kindly notify us.

Postage stamps are acceptable for fractional parts of a dollar—both Canadian and American. American currency also accepted at par.

There is a query regarding the cause of spring dwindling and for this there were many replies. Some believed it was due to prolonged confinement, with overloading of the intestines. Some advised confining bees to the minimum space required for the combs to be covered by bees. One expert believed that dwindling was caused by "the air in the hive being made foul by the breath of the bees" while they are confined during the winter, and he claimed that he had no spring dwindling after ensuring adequate ventilation. One advised the use of doubled walled hives for the bees to winter well. One frank answer was that sometimes it was the bad management of the beekeeper that caused spring dwindling in combination with poor queens, setting out too early, injudicious feeding and unfavourable weather.

One bit of sensible advice to avoid spring dwindling was to address the issue the year before by weeding out poor queens and doing all necessary to ensure that one had strong colonies entering winter. What I found slightly amusing was that most of the experts claimed to have very little personal experience with their colonies suffering from spring dwindling!

In reading this Journal it is clear that opinion is formed by anecdotal evidence and what is missing is reference to scientific experiment. What is also absent is naming any specific disease - no mention of foulbrood, etc.

There are several reports of beekeeper meetings and one item that struck me was under the heading "Good Feelings Must Rule Us" in which it is stated: "if anyone has ill feelings toward any of his fellows it must not be shown through the columns of the Journal." How gentlemanly!

I present this in the hope that some readers share an interest in the past as it can inform us about the present and possibly even a bit of the future. ❀ *~ John Boone*

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Please contact the Editor with any changes.

BC Bee Breeders

This is the continuation of a series which highlights members of the BC Bee Breeder Association.

Deborah Tin Tun & Liam Brownrigg
Six Legs Good Apiaries

We started keeping bees when we both worked for Babe's Honey Farm on the Island. Liam worked there part time for several years while attending Camosen college. This was back when Babe was still alive, and he later got Deb a seasonal job there, after she finished studying music education at UVic. While she was waiting for her teaching certification, Deb ended up working there as a beekeeper full time and was introduced to queen rearing by Bob Mitchell.

We both worked there for a few more years before deciding to leave in order to spend a year working on farms around BC; the honey farm by then had become a difficult work environment due to a change in ownership, and we wanted to learn more about small-scale agriculture.

We spent some time WWOOfing (working on farms in exchange for room and board) in BC, and we kept ending up working for and staying with beekeepers. Those beekeepers became friends (Reg Kienast and Dianne Wells in Armstrong; Liz and Terry Huxter in Grand Forks), and staying with them made us think, hmm, maybe we could do this too. When we moved to Vancouver 6 years ago, we decided to stop fighting it and get our own bees. We bought 6 packages and have been building equipment ever since.

We have built up our business gradually, making increase in good years, and making up our losses in bad, and have gone from 6 to 60 without buying bees beyond our initial purchase. This let us make more of our mistakes when we only had a few hives - much less work to undo! Deb's first job in Vancouver was as an assistant to Heather Higo for a UBC bee research project, and as we were starting our own bees at the same time, this had a big impact on the direction we took with our operation - being able to ask Heather our questions was incredibly helpful. We both work full time at other jobs, so it's a balance to maintain our apiary at a size where we will not be constantly chasing bees out of the trees in the spring, yet we still want enough colonies to breed from.

So we are currently running about 60 colonies, a third of which are in backyards in East Vancouver (in groups of 2, in case by-law enforcement is asking). The bees do very well and are quite productive in our city yards; their overall health is noticeably better than our hives kept outside the city, in agricultural areas. They almost always have abundant pollen in the city, and because city-dwellers water their gardens, they are not as affected by the fairly regular summer droughts that we have. It does take more time to have them in backyards in small numbers; the most amount of time is spent getting in the truck and going between yards - the actual beekeeping time is low!

Deb and Liam helping with VSH testing at Kettle Valley Queens.

Over time, we've reduced down to yards that are very close together. I'd say that our city yards are all within a 20 city-block radius. We also have 2 sites out in the suburbs of Surrey that are about a kilometer apart for breeding purposes.

Storage is an ongoing problem for us, but we've had a lot of support with large equipment needs such as the use of extracting equipment from John Gibeau (Liam works for the Honeybee Centre as his day job). John has really helped make it possible for us to do what we do, living in Vancouver where we do, especially when it comes to things like a little bit of space to store boxes, a place to build equipment, and even something as simple as giving us an address where a pallet of equipment can be unloaded with a forklift - all things not commonly had by Vancouverites!

We focus mostly on honey and queens. We don't pollinate - our bees stay where they are year-round. We also overwinter nucs and sell them. There can be a big demand here in the Lower Mainland for locally bred stock, especially from hobbyists. We're a pretty small operation so there's a hard limit to the orders we can fill, but for us, we do it because we love the breeding aspect, and because it serves a need in our beekeeping community. All of the stock we sell is sold locally.

Liz Huxter and Deb testing for hygienic behaviour in the rain.

The relationships we build are important to us, which is why we don't just sell all that we produce to one buyer.

Adding a queen cell to a nuc.

Probably the best part of beekeeping for us (aside from the bees) is all the beekeepers we've been lucky enough to meet and learn from along the way. I think when we started, beekeeping was not yet so fashionable the way it is currently, and so established beekeepers were really happy to see people younger than 40 take a serious interest in bees - we received a lot of help and support with our bees, and for that we are grateful to the community. We hope that we can pay that forward!

In terms of our breeding operation, we started out using BC stock, which we got from Kettle Valley Queens in Grand Forks, and since then have been lucky enough to get the occasional graft infusion from outside breeding projects, such as the UBC VSH project. We select for hygienic behaviour (using the liquid nitrogen freezing test), how thrifty they are with stores in the spring, and gentleness (our customer base includes those who don't wish to get their faces stung off routinely!)

We score the bees twice in the spring for brood vs. resources. In our first in-depth inspection in March, once it is warm enough to do so, we give each frame a score for how much of the frame is brood and how much is stores. Then each hive gets a total score, and we compare about a month later using the same process. Hives that have a good brood score and also maintain a pretty good score for stores are earmarked as potential breeders.

Currently we sell overwintered nucs, and queens from the current season which are grafted from our own stock.

For our mating setup, we use 3-way deeps for the most part. They are nice because we rarely have to feed them; they have enough space to maintain a good reserve of food. Sometimes we use the odd 5-frame nuc, but it takes a lot longer to find queens that way. We use queenright starter-finishers, and have been experimenting with using a Cloake board for a better "take" on the graft.

We sell about a couple hundred cells during the season (we don't really pursue cell sales, but we consistently get interest in them, and it's easy enough to set up an extra builder or two). We also produce about 150 queens for sale, and 20 or so nucs - mostly overwintered, but some in June once we have queens. Most people want their nucs early, before local queens are possible, and we only use our own queens. So we mostly sell overwintered nucs, and then make our own increase later. The nucs we sell are 5 frames: 4 frames of brood and 1 frame of stores. The queens are available in June.

Feeding nucs.

Brad Cook
Pure Agriculture Ltd.

I started beekeeping when I was 7 years old in Sherwood Park, AB. I had a fascination with social insects from a young age, and saved up my allowance to order 2 packages from Arataki – much to the surprise of my parents. I remember dreaming about splitting up to thousands of hives and becoming 'bee rich'. I was the youngest registered beekeeper in Alberta at the time.

I kept bees with my Grandfather, and in terms of learning more about bees, I read every book I could find on the subject, and learned through trial and error. I was influenced by Ormond and Harry Aebi and their books The Art and Adventure of Beekeeping and Mastering the Art of Beekeeping, which I found at the library in the '80s. There was no YouTube at the time. I did take a course at Beemaid, I think there were 4 of us in attendance; it was 1984 as I recall. There was no Varroa and no foulbroods – those were the days.

I've been in BC since 2013, and as a new commercial beekeeper on Vancouver Island, I'm most thankful to Grant Stringer for imparting his local wisdom.

I'm running 150-200 colonies, depending on how you quantify them.

Brad and his son Liam.

I focus mainly on nucs to the Alberta market. I deliver to Calgary, Edmonton and Lethbridge. Victoria sales were brisk last year though.

I select only the best queens and only use VSH breeding stock. I bring in queens from Olivarez in California, and the performance is consistent. I select the top 1-2% of these queens for genetic incorporation. The difference in mite loads compared to non-VSH is absolutely unbelievable. I will not use non-VSH stock. I select for hygiene and winter hardiness, and I am always on the lookout for tight brood patterns with low mite loads. Underperforming queens get culled and requeened in a hurry.

I use the alcohol method when I check breeders for mites and sugar shake the rest, although I am forever scratching drone cappings when I'm in the hives.

I sell a mixture of queens – the first batch of nucs are sent out with overwintered imported queens and the remainder are imports of the same year.

I take some hives indoors for the winter, they are kept at clustering temps until late January/early February when they get stimulated with pollen and syrup. My best other hives are sheltered, but exposed to ambient temperature and humidity. Indoor wintering has it's challenges but winter survivability is greatly increased.

I'm working on improving hygienic traits in my own breeding stock, and may make the results available to the public when I am satisfied with consistency. The enemy, as always, is spare time. I have a well-paying day job, which is antithetical to serious beekeeping. My wife and I own and operate a firm of consulting engineers. My bees seem to be rather forgiving in spite of me.

The goal.

Alberta yard.

Typical nuc.

When I'm working with my own genetics project, technically I'm using line breeding, and I utilize Instrumental Insemination (II) as well, which I began using in 2014. It is extremely time consuming, but it's more for my 'hobby' genetics project than for any economic purpose. I learned through trial and error, and have improved my methodology by reading the work of others (Cobey). Open mating is too much of a crapshoot unless you have a lot of land, a lot of time, and you can't adequately control the other side of the equation reliably.

For my mating setup, I usually use a deep 5 frame nuc IF I am open mating, and the results are usually culled in the fall and requeened with imports. I attempted 30 last year with dismal results. If and when I am ready to sell my own queens I will utilize quad boxes (quartered shallow boxes) on top of an excluded inner cover, over a queenless single. I start in a nursing nuc and finish in queenless (previously split) singles.

My usual sales market is locally and in Alberta. Last year I sold about 300 nucs and about 400 queens.

I sell 4 frame nucs which have 2 frames of hatching brood, a pollen/honey frame, and a straight honey frame. 5 framers get an extra frame of brood, usually the best 2 or 3 frames in a single plus food. Stock is available for purchase when we get a spring. I expect nucs to be available late March/early April.

Donna Moseanko
Wildwood Queens

I started working with bees in March of 2012 after my dad passed away. He was still living on the family farm near Chilliwack, BC, and had 3 hives, and I volunteered to take over keeping them. Early experiences with my dad's bees were the swarms we would all watch taking off, and then landing on nearby trees. This often happened on his birthday celebrations over the years, during the May long weekend when the whole family would gather.

I moved to Port McNeill in 2013. I searched out a local beekeeper and was able to go out with him to his hives several times in August. Then, I didn't hear from him until the following April. He had been injured in a motor vehicle accident just after August and couldn't contact me. I offered to tend his 75 hives, which were in protected trailers in the cut blocks. I told him that I hadn't much experience, so I met with him and he would give me instructions on what to do for feeding, sorting them out, cleaning out the dead hives, and adding honey supers towards that next summer. I didn't want him worrying about them.

A good friend of his would come out to show me where the bees were. He shared some colourful stories about their adventures; it was a pretty awesome experience. I worked the hives over that spring and into September, when the honey frames were collected. My beekeeper friend continued to have a hard time with his recovery, so his daughter and her husband took over the care of his hives. I didn't know how to split hives, and had little knowledge about the life of the queen. I often saw emerging queens, and queens battling, and more than one queen in a hive. I still wanted to learn more.

In the summer of 2015, I drove across Canada to live with my daughter's family near Guelph, ON. I was supposed to nanny her 1 year old daughter as she was going back to work part-time. I was still keenly interested in bees, and bought 4 nucs in June, then got bored and bought 25 more. Needless to say I was fired from my position of "Granny Nanny", as I was always out with the bees

which were placed on an organic farm nearby.

Over that summer I created 6 more hives, and built, assembled, painted, moved boxes, frames, bees, queens…the learning curve was steep! Those 35 hives built up and overwintered successfully. Once, in a hotel conference room, I was one of several beekeepers waiting for their order, helping with the sorting and watering (a swipe of a dipped finger across the queen cage screen once a day until hived) of hundreds of early queen bees newly arrived from New Zealand.

My mentor in Ontario, Doug McRory, taught me a lot about bees. He still raises queens and nucs and runs over 400 colonies. When visiting my daughter I make time to spend with him working his bees. This past summer we were placing emerged virgin queens into honey production hives to be mated, and checking Nicot cups on bars for viable larvae which would be placed into queenless finishing hives. This was a timely experience for me.

The Nicot system is a non-grafting method for raising local queens. A kit comes with 110 plastic queen cups in a small frame, which you attach with elastics or glue to a regular frame from your hive. The Nicot frame comes with a queen cage. First you put the Nicot frame into the brood area of your chosen breeder queen and cage her out, so that the workers can 'polish' the cells. After 3 days, you place the queen inside the cage so that she can lay directly into the Nicot cups. After 4 more days, you take the cups with viable larvae and attach them to your cell builder frames.

Doug with Nicot frame in place.

I heard a speaker at an Ontario Beekeepers Conference once talk about Instrumental Insemination of queen bees and the result on the queen's health, her productivity and the overall effect on the hive when some of the factors of mating can be controlled. This really interested me. I later took a workshop with Susan Cobey on queen insemination. I also really enjoyed Liz Huxter's talk at an Ontario conference, on the importance of drones.

I began to wonder, where in Canada with a milder climate could early queens be raised? I had visited Powell River during the past 12 years, and ended up moving there two years ago. I hoped to eventually raise Instrumentally Inseminated queens using local genetics.

I discovered that with the amount of rain on the west coast, mating virgin queens may be delayed and the optimal age for her to mate may pass. With II queens, this problem can be eliminated. Another challenge is

having enough mature drones from which to gather semen. Perhaps the chosen drone mothers can be encouraged to produce them earlier?

Here in a small town, it is good business to have multiple sources of income. I raise extra queens, some starter hives, take care of Coast Berry Farm's honey bee hives, set up beekeeping workshops, speak at the local Garden Club, sell hive equipment, products and honey and make beeswax food wraps to sell in the local market and stores.

The genetics in Powell River that I want to raise stock from have had entirely self-generated queens over 9 years without outside queens being introduced. The beekeeper who has these hives let the bees raise their own queens as needed, over the years. My original 11 hives, separate from his, are Carniolan from Chilliwack and the Interior, and some are from Kettle Valley Queens, via another beekeeper on the south coast.

My selection criteria are that I would like to have gentle bees that are able to overwinter in our wet coastal climate. I wonder, if all other factors were equal, in using the II mating of virgin queens, would this one factor of maximally mating the queen produce a diverse colony of bees? Would the queens be healthier because the attendant bees are drawn to her strong pheromones? Our changing weather patterns are playing a role in the life cycle of our honey bees. Perhaps with the assistance of II, we can raise more of our own local queens.

Queen and retinue.

I haven't used any specific tests to define desirable traits. Handling the hives, you get a visual sense of the health and temperament of each hive. We all want hygienic bees, so that will be on my list this summer.

This spring I will have some overwintered queens, and also I will sell nucs, adding extra queens from local breeders

Instrumental insemination.

where they are needed. My focus will be using the 9-year local population for queens, and collecting drone semen from other queens in that population that have proven high honey production/overwintering ability.

For proving queens, after insemination, I will use a populated 4 frame queenless hive in a plywood box and add another on top as needed. My setup for starters and finishers is to use a queenless, well populated hive, with Nicot cups that my chosen queen has laid eggs in. I will be using a double 10 frame, queenright hive with queen excluder, Cloake board and nurse bees above, with the entrance turned 180 degrees, following Michael Palmer's techniques.

At this time my market is local backyard beekeepers and a couple of blueberry farms. Last year was a starting year and I sold 40 nucs and 15 queens.

My ideal nuc is 5 frames; two frames with capped brood on both sides with nurse bees covering, two with a mix of honey and pollen, with larvae in various stages and bees covering, and the 5th frame drawn for the queen to lay in, and to have extra room for the field bees.

This spring I will be selling stock in mid-April/mid-May, until September.❀

Keeping a Scale Hive

by Steve Clifford

During the course of bee season I do a lot of things that I really enjoy; high on that list is keeping a scale hive. I can't think of any tool that's as informative and helpful as being able to check that scale each morning and know what's happening with a colony's weight loss or gain.

Before I sat down to write this, I looked scale hives up in my aging copy of Roots' *ABC XYZ of Beekeeping*. The rather brief article recommended using a stronger colony on the scale and touted the value of knowing just how the honey flow was progressing. I've heard it suggested that when you put a hive on a scale it shows off; methinks it's more likely the beekeeper that shows off.

When I first kept a scale hive, I tried various methods of two-queening, trying to get a hive on that scale that would really ring the bell. I remember the daily gains in the mid 20lb range, and I remember noticing just how much a small variation in the weather affected the production.

Knowing just how the main honey flow is progressing is valuable stuff, but equally important is knowing what's happening during that all important buildup period. In Saskatchewan, where I kept bees for 40 years, we enjoyed a wonderful buildup flow in most years from wild fruit, dandelions and caragana. The tricky part to maneuver was the dearth between that initial flow and the main, surplus flow. Being able to watch that scale was invaluable when deciding how to feed and super in the days leading up to the main flow.

In past years, I have simply picked out a good looking breeder/cell builder and let it do double duty as my scale hive. Having it on the scale from early spring through fall feeding provides a wealth of information and saves a whole bunch of guess work; the scale tells the story. In the years that I wintered single story hives indoors, I stacked 4 singles on the scale to track their weight loss. I've kept a scale hive for many years, and when I get down to two hives, a short walk out to the garden away, I'll have one of them on a scale.

I've had that old 1000 lb scale shown in the photo since 1976; it's probably damn near as old as I am. It's a platform scale, originally used to weigh barrels of honey, and came with the 1500 hive bee outfit I took over when I was starting out. I wanted a scale hive way back when, so

I bought another to weigh drums with. The set-up is pretty simple. Get it level, put your chosen hive on, and you're in business.

I don't know what it's like to buy them these days; new ones are digital and surely very pricey. The bee supply houses used to sell little crude scales, but I haven't seen them lately. ❀

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Ashcroft Honey
Joe & Marguerite Lomond
Savona
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Q N, bee supplies

BBBees
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Oliver
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Bear Creek Honey
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Q N

- **B = Bulk Bees**
- **C = Queen Cells**
- **Q = Queens**
- **N = Nucs**
- **P = Packages**
- **S = Shook Swarm**

Regulatory Framework for the Importation of Honey Bees in Canada

by Peter Armitage[1]

Back in the day, northern BC beekeepers killed their colonies in the fall with cyanogas (calcium cyanide) and counted on the importation of packages from the United States. to kick-start their apicultural operations the following spring. Restrictions on the use of the gas and the 1987 closure of the Canada-US border to package importation due to tracheal and *Varroa* mite concerns brought this practice to an end.[2] As a result, these beekeepers had to figure out quickly how best to overwinter their bees or find import alternatives to what they got from the US. Today, the importation of honey bees from international sources – be it packages or queens – is a fact of life, and many beekeeping operations would be in serious trouble if not for importation. Bees are imported for many reasons but primarily for spring build-up to meet the demands of pollination contracts and commercial honey production (particularly after heavy winter losses), breeding purposes (e.g., resistance to varroa mites and brood diseases), or scientific research.

Spring inspection in St. John's.
P. Armitage photo

My interest in honey bee importation was sparked in my adopted province of Newfoundland and Labrador (NL) when we had a controversial importation of packages of Western Australian honey bees in April 2016. Apart from concerns about the winter hardiness and temperament of these bees, few would blink an eye elsewhere in Canada about such imports. However, we're hypersensitive about importation in NL because we're free of varroa mites, small hive beetle (SHB), tracheal mite, wax moth, and American foulbrood (AFB), and we want to keep it that way! Beekeepers here support our provincial government's import restrictions, which require import permits and screening for all of these pathogens and pests except AFB. While the Western Australian import was legal, few if any of us knew the importation process, or its legal, regulatory framework, which contributed to distrust and acrimony surrounding the import. While Western Australia is also varroa-free, many beekeepers here had concerns about the apparent lack of risk assessment, and thoroughness of the screening of the imported bees for pathogens, pests, and diseases other than varroa mites. We were also concerned about the apparent lack of risk assessment involving a rigorous examination of the hazards of importation, the potential spread of exotic pathogens and pests, and the economic consequences of this.

It is the apparent opaqueness of the process and my personal need to make sense of it that provided the impetus for this article and the research behind it. The following is a summary of what I've learned so far about how we import honey bees into Canada, based in part on several World Organisation for Animal Health (OIE) documents such as Dr. Steve Pernal's 2014 summary of Canadian regulations in *Bee Health and Veterinarians*, Canadian Food Inspection Agency (CFIA) documents, and interviews with a number of people across Canada who are directly involved in the importation process.[3]

You may wonder why I chose to send this article to a BC publication, and why the editors have agreed to print it. The information presented here has little to do per se with beekeeping in NL. It's focus is on a topic that all beekeepers in Canada have a vested interest in (eg. importation of packages from the US), and which our associations are all called upon to consider from time to time. We do have a newsletter in NL which reaches about 50 beekeepers. Publishing it here means that the content reaches a far wider audience.

At one level, importation is as easy as contacting one of the honey bee retailers, a number of whom advertise in *BeesCene*.[4] If they're selling packaged bees, they'll provide information about the stock they carry and how best to install the packages in your hives. What you may not know is that retailers may be obtaining the packages from someone (import broker) who has established commercial relations with suppliers in the exporting country, and expert knowledge of the regulatory framework for imports, associated paper work and logistics. There are several main suppliers/importers of honey bees in Canada who provide the bulk of packages and queens for commercial honey production and pollination as well as many beekeepers who import primarily for their own operations.[5]

The Canadian Government's Role in Honey Bee Importation

The Canadian government has the constitutional authority to oversee and regulate honey bee importation because it concerns international trade. The relevant federal legislation is the *Health of Animals Act* which gives the Minister of Agriculture and Agri-Foods the power to "make regulations prohibiting the importation of any animal or other thing into Canada, any part of Canada or any Canadian port…for such period as the Minister considers necessary for the purpose of preventing a disease or toxic substance from being introduced into or spread within Canada." The pertinent regulations are called the *Health of Animals Regulations*, and they contain a number of provisions relevant to honey bees. For example, honey bees are classed as a "regulated animal" and "no person shall import a regulated animal except…in accordance with a permit issued by the Minister," or in accordance with

other provisions dealing with the conditions under which importation can occur without a permit. Other important provisions cover honey bee diseases in the exporting country, and allow the federal government to designate a country "as being free of a disease or as posing a negligible risk for a disease." However, this designation must be based on several criteria such as the prevalence of the disease in the exporting country, its veterinary-scientific capacity ("zoosanitary infrastructure"), and its capacity to monitor and manage the introduction or spread of disease.

In general, the interprovincial movement of bees is the responsibility of provincial governments, each of which has legislation and regulations related to honey bees. However, in BC the authority of the federal government with respect to honey bee importation from outside Canada is recognized under Section 6(1) of *BC's Bee Regulation (Animal Health Act)* which states, "A person must not transport or possess in British Columbia bees originating… from outside Canada except in accordance with an import permit issued, under the *Health of Animals Act* (Canada), to a beekeeper or an association in respect of the bees."[6]

The CFIA is responsible for the administration and enforcement of the Health of Animals Act and reports to the Minister of Agriculture and Agri-Foods. It assesses the zoosanitary infrastructure and status of honey bee diseases/pests in exporting countries as well as the status of such diseases/pests across Canada, the latter with input from provincial government apiarists.

The Canadian Honey Council (CHC) and Canadian Association of Professional Apiculturists (CAPA) provide input into CFIA importation decisions. For example, in 2011, the CHC asked CFIA to "review current import conditions as they pertain to Small Hive Beetle, thus facilitating and securing the importation of healthy queens free from Small Hive Beetles into Canada for the needs of the Canadian honey and crop pollination industries."[7] As for CAPA, in 2000, its Import Committee considered a request to import French queens for "genetic evaluation for Varroa resistance and a request to import eggs and semen from the USA from the Russian Bee Project…for evaluation for Varroa resistance" (CAPA, 2000:18). CAPA recommended to the CFIA that these imports be allowed.

CAPA also is heavily involved with research into the health status of the honey bee stocks across Canada through its annual wintering loss surveys, engagement with the National Bee Diagnostic Centre in Beaverlodge, Alberta, regarding the Canadian National Honey Bee Health Survey, and other ways.[8] "Accurate disease distribution information helps to inform regulators [such as CFIA] when they try to determine the risk associated with the importation of bees from other regions….Without valid surveys within a country, it is impossible to claim pest-free status and the absence of bee diseases."[9]

The CFIA assesses the risks of importing honey bees into Canada from specific countries, decides whether to allow importation, and if so, under what conditions. According to the CFIA,

> '...qualitative risk assessment is based on the approach recommended by the World Organisation for Animal Health (OIE) and consists of the characterization of hazards with entry, exposure and consequence assessments. The qualitative assessment includes the likelihood of the introduction of the hazards into Canada…(entry assessment); the likelihood of potential hazards spreading and/or becoming established within the domestic honey bee population in Canada (exposure assessment); and the expected magnitude of the resulting consequences (consequence assessment).'[10]

The CFIA conducted risk assessments in 2003 and 2013 regarding the importation of packaged bees from the US, and concluded that restrictions on such imports should be maintained due to concerns about Africanized genetics, antibiotic-resistant AFB, SHB, and amitraz-resistant varroa mites.[11] Following the discovery of the exotic Asian honey bee (*Apis cerana*) in Darwin, Australia, in June 1998, the CFIA reviewed Australia's eradication and surveillance efforts, and modified its import requirements to permit continued importation from all parts of Australia except the Northern Territory.[12]

Currently, imports of packaged bees and queens are prohibited from most countries due to the high risk of infecting our domestic stocks with pathogens, pests and diseases that are not already present here. Table 1 lists the countries from which imports of packaged bees and queens are permitted by the CFIA.[13] As noted by Pernal, "[i]mportation into Canada from any other country than those listed previously [Table 1] requires a separate risk assessment for the exporting country and then application for an import permit on a case-by-case basis. Importation of honey bee eggs (embryos) and semen for scientific and breeding purposes are also handled in a similar manner."[14]

In all cases, importation comes with conditions, and it is the CFIA that establishes them. For example, the CFIA requires competent personnel (e.g., veterinarians) to inspect bees destined for export and to certify that they are disease-free and/or have been inspected according to CFIA standards. No matter what type of live bee product is being imported, an Import Permit from the CFIA and a Zoosanitary Export Certificate from the exporting country are required. These requirements are spelled out in the Automated Import Reference System (AIRS) information available on-line.[15]

country/jurisdiction	packages	queens
California	no	yes
Chile	yes	yes
Denmark	no	yes
Hawaii	no	yes
New Zealand	yes	yes
Tasmania	yes	yes
United States (other than California and Hawaii)	no	yes
Western Australia	yes	yes
Other countries	no	no

Table 1. CFIA Restrictions on honey bee importation by country/jurisdiction.

Regarding packaged bee imports from Australia, for example, an inspector of the Australian Department of Agriculture and Water Resources must certify that the exporting zone (e.g., Western Australia or Tasmania) is free of Africanized genetics, varroa mites, *Tropilaelaps* spp., SHB and Asian honey bee, and that exporting apiaries are free from AFB and European foulbrood (EFB). A bee sampling and inspection protocol for visible evidence of these brood diseases is specified. Also, the

bees must be shipped by a route approved by the CFIA and in a manner that prevents them from acquiring pests en route such as SHB.

International Trade and the World Organisation for Animal Health

Canada cannot act arbitrarily with respect to its import decisions because its regulatory framework must be consistent with the protocols it agrees to as a member of the World Trade Organization (WTO), an intergovernmental organization of 164 member states that regulates international trade. In general, no member state can create artificial barriers to trade in animals or animal products unless it can argue, based on a scientific risk assessment, that importation poses a risk to the health of domestic stocks or humans.

As noted previously, the standards for risk assessment and protocols for testing and monitoring honey bee pests and diseases are recommended by the OIE which is recognized by the WTO as "the international standard setting organisation for animal health and zoonotic diseases"[16] under the terms of its Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). According to this agreement, "WTO Members should align their import requirements with the recommendations in the relevant standards of the OIE" as set out in the *Terrestrial Animal Health Code (Terrestrial Code)*. The code "sets out standards for the improvement of terrestrial animal health and welfare and veterinary public health worldwide, and for safe international trade in terrestrial animals (mammals, reptiles, birds and bees) and their products."

The OIE recommends that,

> '...the health measures in the *Terrestrial Code* should be used by the Veterinary Authorities of importing and exporting countries for early detection, reporting and control of agents pathogenic to terrestrial animals and, in the case of zoonoses, for humans, and to prevent their transfer via international trade in terrestrial animals and their products, while avoiding unjustified sanitary barriers to trade.'[17]

The OIE also publishes a *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (Terrestrial Manual)* to assist laboratories and regulatory authorities in member countries with the design of their veterinary diagnostic tests and surveillance protocols for pathogens, pests and diseases. A primary objective of the *Manual* is to "provide internationally agreed diagnostic laboratory methods and requirements for the production and control of relevant vaccines and other biological products."[18]

Standards related to honey bee pathogens, pests and diseases are designed by one of the OIE's specialist commissions known as the "Scientific Commission for Animal Diseases."[19] In recent years, the hard labour of drafting new standards and revising existing ones for honey bees was delegated to an "*Ad Hoc* Group on Diseases of Honey Bees" which met several times between 2010 and 2012. The current OIE standards for honey bees were drafted by the seven honey bee scientists who were members of this group.[20]

In order to be listed in the *Terrestrial Code*, a disease or pest must have spread internationally, at least one country remains free of it, it causes significant symptoms or mortality, there are reliable means of detecting and diagnosing it, and cases can be distinguished clearly from other diseases, infections or infestations. While recognizing that honey bees have many pathogens, pests, predators, and diseases, the OIE's *Terrestrial Code* focuses on those that currently have a significant impact on honey bee health and commercial beekeeping (e.g., pollination services). Currently, for honey bees, the *Code* lists AFB, EFB, Varroosis (caused by varroa mites and the viruses they vector), Acarapisosis (caused by tracheal mites), *Tropilaelaps* spp. and SHB infestations. Honey bee viruses, of which 24 have now been identified, are not included here due to lack of data concerning their clinical signs, impact on honey bee health, or distribution in the absence of varroa mites.[22]

Canada and other OIE-member states are required to notify the OIE about the status of listed diseases and pests in their countries. This requirement is reflected in the federal *Health of Animals Act* which lists fluvalinate-resistant varroa mites and SHB as "immediately notifiable," and acarine disease (tracheal mite), AFB, EFB and Nosematosis as "annually notifiable" diseases. When SHB turned up in colonies in Manitoba, Ontario, and Quebec, the provinces reported the infestations to the CFIA which in turn notified the OIE. Similar notifications by countries like Australia facilitate the monitoring of their honey bee diseases and pests and import decisions by the CFIA.

Countries can adopt "a level of protection requiring measures more stringent than the standards of the OIE, [however] these should be based on an import risk analysis conducted in accordance with Chapter 2.1" of the *Terrestrial Code* dealing with import risk analysis. Canada has, in fact, adopted more stringent measures for one pest and has also added Africanized genetics to its import restrictions, as a comparison of OIE recommendations with CFIA requirements shows (see Table 2).

Pathogen/pest/issue	OIE[23]	CFIA[24]
American foulbrood	yes	yes
European foulbrood	yes	yes
Acarapis woodi (trachael mite)	yes	no
Tropilaelaps spp.	yes	yes
Varroa spp.	yes	yes
Small hive beetle	yes	yes
Africanized genetics	no	yes
Apis cerana (Asian honey bee)	no	yes

Table 2. OIE listing of pathogens, pests and other import issues compared to CFIA screening regarding package bee imports from Australia.

Protecting Honey Bee Health in the Context of International Trade and Globalization

Beekeepers know that honey bees provide an extremely valuable ecosystem service through pollination of cultivated and wild plants. The value of their contributions to the environment and agriculture is far greater than the value of honey and other honey bee products. While international trade agreements and national laws and regulations were designed to manage honey bees and their diseases using science-based risk assessment, management has various challenges,

especially in a globalized world with a human population expected to reach 9.8 billion people by 2050. For a start, demand for pollination by honey bees in many countries is increasing faster than the number of honey bee colonies, which challenges existing capacity to provide pollination services, and results in increased migratory beekeeping and associated risks of pathogen and pest transmission.[25]

Key parts of the world's food supply are dependent upon migratory beekeeping (e.g., almonds, apples, blueberries, cranberries, canola, etc.), a type of apiculture where disease management is difficult without robust methods of surveillance, reporting, and control as well as the active participation of beekeepers in the process. In effect, the CFIA recognized this challenge in its 2013 risk assessment of packaged bee imports from the US when it referenced the "highly migratory nature of the US beekeeping industry" and related this to "increased exposure to diseases and increased levels of treatment (higher dose and multiple prolonged periods of treatment), leading to increased resistance of parasites and diseases in the USA honey bees."[26] The absence of interstate colony movement controls and the wide variation in disease control and inspection programs from one state to the next were of major concern to the CFIA.

Honey bee on mountain alder in Newfoundland. *P. Armitage photo*

The vast scale of migratory beekeeping and the often widely dispersed beekeeping operations across their jurisdictions stretch the resources of government apiarists and their inspectors, particularly during times of fiscal restraint, making it difficult to detect incursions of pathogens and pests and to enforce regulations concerning the movement of honey bee colonies across internal boundaries (provincial, state).

Furthermore, pathogens and pests cross borders despite risk assessments, inspection, and surveillance, sometimes because of imperfect inspection methodologies, but also because of the risky actions of beekeepers themselves. For example, transported north from southern American states by migratory beekeepers, varro mites crossed the border from Maine into New Brunswick in 1989 as a result of drifting or swarming honey bees from infested colonies.[27] The parasitic mite is rumoured to have been introduced to PEI, Nova Scotia and Thunder Bay, Ontario, by way of careless or illegal importations.

SHB has crossed borders with human help more than once. In 2002 it was brought accidentally to a beeswax rendering plant near MacGregor, Manitoba, in raw wax cappings from Texas.[28] In 2006, it was accidentally imported into Alberta and Manitoba in a shipment of package bees from Australia.[29] In 2011, an adult SHB "as well as first and second star larvae, were found on the packing material of queens imported from Hawaii…with destinations in Manitoba and Alberta."[30] SHB was discovered in the Peace River region of Alberta in July 2017, having been imported illegally with colonies coming back from pollination in Ontario.[31] The beetle was also discovered in June 2017, in legally imported colonies transported from Ontario to New Brunswick for blueberry pollination, despite "rigorous requirements for beekeepers moving hives out of SHB-positive yards."[32]

Accidental importations of pathogens and pests unrelated to the transport of honey bee colonies have occurred in some countries as well. For example, the bee killing Asian hornet arrived in France around 2005 in pottery from China, and the Asian honey bee (*Apis cerana*) arrived at Australian ports on several occasions by way of commercial shipping and cargo. Chalkbrood infection in South Perth, Australia, was traced to robbing of contaminated pollen in a drum imported by a health food business.[33]

Another consideration is that "[d]iseases and threats are continuously evolving, and in the current context of globalization, Canada must remain vigilant in maintaining our bee health status," as noted by Canada's Deputy Chief Veterinary Officer, Dr. Jaspinder Komal.[34] One example of an evolving threat is the spread of Africanized genetics in Californian honey bee colonies, an important source of queens for many Canadian beekeepers.[35] The CFIA, our provincial apiarists and their counterparts in Australia, New Zealand, the US and other countries, monitor these developments and adjust importation protocols if necessary to protect domestic stocks.

Viruses are another ball of beeswax. As noted previously, they are not included in the OIE's *Terrestrial Code* and international import/export decisions because much is still unknown about their virulence and distribution. An exception is Israeli Acute Paralysis Virus which factored significantly in the US government's 2010 decision to prohibit importation of adult honey bees from Australia. "Viruses once thought to be inconsequential…[were] reevaluated in light of transmission by *Varroa* mite, interactions with *Nosema ceranae*, and further complications from Colony Collapse Disorder."[36] Canada has never restricted importation because of concerns about particular viruses, although restrictions related to varroa are a "package deal"; efforts to manage the mite also help us manage the spread of viruses.

Arguably, the chances of exotic pathogens and pests entering Canada could be reduced were our border totally closed to all honey bee imports. Some beekeepers argue, moreover, that we can meet the demand for packages and queens through increased domestic production, which would reduce the risk of introducing exotic pathogens and pests to our bees. However, without greatly increased domestic production, the economic consequences of closed borders for our commercial beekeepers and agricultural production in many parts of the country would be severe.

Looking to the future here in NL, we will need to import honey bees from other parts of the world if for no other reason

than to better prepare our stocks for a possible varroa mite invasion. While formal risk assessment is the best way to weigh the pros and cons of any import, we can reduce the risk of introducing exotic pathogens and pests by more thoroughly testing bees prior to import, particularly for viruses not already present in our stocks. Nonetheless, importation will always carry some level of risk. This is why all importation proposals and risk assessments must be transparent processes, so that our beekeeping community can collectively weigh the benefits of importation in relation to the costs. ❀

End Notes

1. Peter Armitage was born and raised in B.C. where he was introduced to beekeeping in the 1960s by his late step-father, Dave Laidman, and beekeeping pioneer, Leo Fuhr, both residents of Vernon. In preparing this article, he consulted a number of bee scientists and long-time beekeepers including commercial operators. The views expressed in this article are entirely those of the author.

2. D.M. McCutcheon. 2013. A History of Beekeeping in British Columbia from 1950 to 2000. B.C. Honey Producers' Association. p.63.

3. See S.F. Pernal. 2014. "National regulations for beekeeping in North America (Canada and the United States of America." In Wolfgang Ritter (ed.). Bee Health and Veterinarians. Paris: World Organisation for Animal Health, pp.275-280. Pernal is a research scientist with Agriculture and Agri-Food Canada.

4. Some basic information on how to import bees into BC is provided by the Plant & Animal Health Branch, of the provincial Ministry of Agriculture. See Apicultural Bulletin #2, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/animal-production/bee-assets/api_fs002.pdf

5. Some beekeepers organize their imports through group purchases but they do this with the assistance of import brokers. Some of the bigger Canadian importers include Bartel Honey Farms (Manitoba), Bee Maid (Prairies), Early Queen Arrivals (Ontario), Kemnay Apiaries (Manitoba), Morley Clarke (Saskatchewan), Oaknook Honey Products (Manitoba), and Scandia Honey (Alberta). Import brokers may have exclusive arrangements with suppliers in the exporting countries, e.g., as sole source agents for the sale of a given stock from an exporting country. Some BC beekeepers also organize their own queen imports each year primarily for personal use. They resell to few if any other beekeepers.

6.See the Government of British Columbia's Bee Regulation (Animal Health Act), BC Reg. 3/2015, O.C. 18/2015, http://www.bclaws.ca/civix/document/id/complete/statreg/3_2015#section6

7. Minutes of the Canadian Honey Council Annual General Meeting, 4 Jan. 2011. Hivelights. 2011.24(2): 19-20.

8. CAPA's members include provincial apiarists, researchers, apiary inspectors, apicultural technicians and other professionals who work with managed bee species. See CAPA. 2000. Proceedings 2000. http://capabees.org/content/uploads/2013/02/CAPAProceedings2000.pdf

9. D. vanEngelsdorp, C. Saegerman, B.K. Nguyen, and J.S. Pettis. 2014. "Honey bee health and surveillance." In Wolfgang Ritter (ed.). Bee Health and Veterinarians. Paris: World Organisation for Animal Health, pp.219-220.

10. See CFIA. 2013. Risk Assessment on the Importation of Honey Bee (Apis mellifera) Packages from the United States of America. Animal Health Risk Assessment, Animal Health Science Division, Animal Health Science Directorate. p.i. http://www.ontariobee.com/sites/ontariobee.com/files/Final%20V13%20Honeybeepackages%20from%20USA_Oct21_2013.pdf Paul van Westendorp, B.C.'s Apiculture Program Manager, provided a succinct description of the risk assessment process in the fall 2013 issue of BeesCene (Vol. 29, 3). http://bcbeekeepers.com.s205363.gridserver.com/wp-content/uploads/2016/04/BeesCene-Fall-2013.pdf

11. ibid.

12. See CFIA, Additional References, Automated Import Reference System, Import Requirements for Australia, "BEES – EXPLANATORY NOTES: Fees for Import Permits – Honey Bees from Australia – 1999-12-14. For a succinct history of exotic honey bee pests in Australia see Table 2, "A list of incursions and potential incursions involving honeybee pests" (Barry, S., D. Cook, R. Duthie, D. Clifford, and D. Anderson. 2010. Future Surveillance Needs for Honeybee Biosecurity. Government of Australia. Rural Industries Research and Development Corporation. RIRDC Publication No. 10/107. p.10).

13. Imports of queens only are permitted from Denmark. However, Danish stock is primarily Buckfast, and there is currently little demand for it in Canada, hence, little in the way of imports. New Zealand was the biggest exporter of packages to Canada in 2015, followed by Australia (measured in CDN dollar value). The U.S. was the biggest exporter of queens to Canada the same year (measured in dollar value) followed by Chile, New Zealand, and Australia. See Statistics Canada (CATSNET, May 2016), and Agriculture and Agri-Food Canada. "Statistical Overview of the Canadian Honey and Bee Industry, 2015."

14. Pernal (2014:279).

15. CFIA, Automated Import Reference System, 29 June 2016, http://airs-sari.inspection.gc.ca/airs_external/english/decisions-eng.aspx)

16. Canada is a member of the OIE. "Zoonotic diseases" (zoonosis, zoonoses) are diseases that can be transmitted to humans from animals.

17. OIE. 2017. Terrestrial Animal Health Code. p.i. See http://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/current/preface.pdf

18. See http://www.oie.int/manual-of-diagnostic-tests-and-vaccines-for-terrestrial-animals/

19. A detailed description of how the OIE operates is beyond the scope of this article. For more information on the work of the OIE's specialist commissions and ad hoc groups, see "Procedures used by the OIE to set standards and recommendations for international trade, with a focus on the Terrestrial and Aquatic Animal Health Codes." http://www.oie.int/fileadmin/Home/eng/Internationa_Standard_Setting/docs/pdf/A_OIE_procedures_standards_2016.pdf

20. Members of the Ad Hoc Group included Dr. Mike Allsopp (South Africa), Dr. Mariano Bacci (Argentina), Dr. Pierangelo Bernorio (Belgium), Dr. Rafael Calderon (Costa Rica), Dr. Marie-Pierre Chauzat (France), Dr. Jeffery S. Pettis (United States), Dr. Howard Pharo (New Zealand), and Dr. Wolfgang Ritter (Germany). See Meeting of the OIE Ad Hoc Group on Diseases of Honey Bees, Paris, 10-12 July 2012, Appendix 2, https://www.oie.int/doc/ged/D12109.PDF

21. See Michael Brown. 2007. "Overview of the Regulatory Framework for Apiculture." In Michel Aubert, et al. [eds.]. Virology and the Honey Bee. European Commission, Directorate-General for Research. Brussels. p.402; also OIE. 2012. Report of the Meeting of the OIE Ad Hoc Group on Diseases of Honey Bees. Paris, 10-12 July 2012. In OIE Report of the Meeting of the OIE Scientific Commission for Animal Diseases, Paris, 27-31 August 2012. Annex 7.

22. Pernal (2014:278).

23. World Organization for Animal Health (OIE). 2017. The OIE Terrestrial Animal Health Code (Terrestrial Code).

24. CFIA Automated Import Reference System for Australia.

25. OIE. nd. "General introductory text providing background information for the chapters of the Terrestrial Animal Health Code on diseases of bees." http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/A_Introduction_Bees_July2013.pdf

26. See CFIA. 2013. Risk Assessment on the Importation of Honey Bee (Apis mellifera) Packages from the United States of America. p.18.

27. CAPA. 1990. Minutes of the Annual Meeting of the Canadian Association of Professional Apiculturists, Winnipeg, Manitoba, January 21-23, 1990, p.17. http://capabees.org/content/uploads/2013/02/CAPAProceedings1990.pdf

28. Phil Veldhuis report. 2002. "Cross Canada Reports." Hivelights. 15(4): 5. Strict protocols were imposed regarding the importation of beeswax shortly after this incident.

29. S.F. Pernal and H. Clay. 2013. Honey Bee Diseases and Pests. Beaverlodge: CAPA. 3rd edition. p.37.

30. CFIA. 2011. "Small Hive Beetle in Honeybee Queen Shipments from Hawaii." Hivelights. 24(3): 3.

31. M. Nasr. 2017. "Quarantine area in the Peace River region established for small hive beetle found in honey bee colonies." http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/prm13239/$FILE/SHB_Letter-MN_%2019072017.pdf

32. According to the Ontario Beekeepers' Association, "Ontario currently imposes rigorous requirements for beekeepers moving hives out of SHB-positive yards. This includes both 100% top bar and 10% brood nest inspections. Beekeepers from Niagara or others with small hive beetle finds are obligated to file movement plans with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) before they are permitted to move bees." "Update on Small Hive Beetle." 2 Nov. 2017. http://www.ontariobee.com/sites/ontariobee.com/files/document/OBA_SHB_Bulletin_November_2_2017_ver_3.pdf

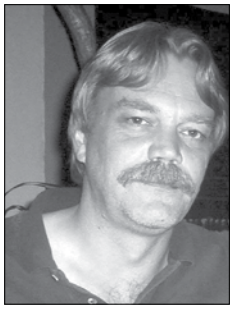
33. Government of Western Australia. 2013. "Endemic Honey Bee Diseases and Pests in Western Australia. Department of Agriculture and Food."

34. Dr. Jaspinder Komal statement to House of Commons Canada, Standing Committee on Agriculture and Agri-Food, June 6, 2016, Evidence, Number 016, 1st Session, 42nd Parliament.

35. Kono, Y. and Kohn JR. 2015. "Range and Frequency of Africanized Honey Bees in California (USA)." PLoS ONE. 10(9): e0137407. https://doi.org/10.1371/journal.pone.0137407

36. See Federal Import Order. Prohibit Importation of Adult Honey Bees (Apis mellifera) from Australia. December 21, 2010. http://www.michiganbees.org/wp-content/uploads/2011/01/Australia-Honey-bee-Prohibition-FO_12-20-2010.pdf See also, "Virus implicated in Colony Collapse Disorder in bees" https://www.sciencedaily.com/releases/2007/09/070906140803.htm

Regional Reports



North Vancouver Island
~ Gerry Rozema

January is always the hardest time to write for the BeesCene. The general consensus is that there's not much happening with bees here on the northern part of our island over the winter. However, this is the time for planning, and possibly spending some time in the shop getting equipment built and ready for the upcoming season. By the time we are asked to write the next report, bee season will be in full swing again. I'm writing this on January 27th, and it's sunny out after a small dump of snow overnight, but hazelnut trees are showing signs of life. The first pollen of the season is imminent, and with that will come our first early brood.

The early brood we see here in the mild February weather can be a blessing or it can be a curse. As often as not, old man winter is not finished with us by mid-February, when we see that brood triggered by the first early pollen, and another round of cold weather rolls through during late February or early March. When that cold hits, clusters shrink down as they tighten up, and some of the new brood is chilled. An even worse side effect is that the cluster won't move off the brood patch, and it can leave them out of contact with honey stores, which means the bees may begin to starve. It's common for the newer beekeepers to do a round of hive checks in mid to late February and proudly announce that 'all the hives made it through the winter', as they are all still alive. The problem with this logic is that here in this area, we lose more colonies during March than we do in the period from October through February.

In the past, my answer to questions about why colonies were lost in early spring was always, 'that is the way it goes here on the Island', with no definitive reasoning as to why. For those that attended the BCHPA AGM last October, the answer to this question became more clear during a couple of the presentations. Randy Oliver addressed it in his discussion on managing for spring buildup, and it was also discussed by Ian Steppler, who drew heavily on Randy's graph showing buildup and decline of colonies throughout the year. Both speakers focused on the turnover period, when the long lived winter bees start rearing brood, literally working themselves to death raising that first round of spring replacements. If that first round of brood during the turnover period is not a success, we end up with a colony that is dwindling through the month of March. This explains why we have more colony fatalities in March than in the period from October to February.

I found that both speakers gave a good explanation for something we have all seen, but had not yet pinned down the 'why' of what we were seeing. In the time that I've been involved with the BCHPA, the education day presentations at the meetings have certainly been worth the time and effort to attend, and the knowledge we gain from these events becomes invaluable over time. I'm looking forward to seeing everybody in March, and hearing from yet another keynote speaker that has lots to offer.

North Okanagan
~ Richard Plantinga

After a normal fall, with bees still out in October and into November, some were nervous about food stores. Then the temperature dropped and we are now getting regular snowfalls, with steady temperatures keeping the girls at home. Lately we have had a few flying days, but no really warm days so far. The girls seem to be alright for now, but of course the spring dwindling is still to come.

We started our monthly meetings with a potluck and a good number of beginning beekeepers. As our President Dan Mawson is leaving us, we now have Keith Rae to guide us. We are looking forward (hopefully) to a normal spring.

Peace Region
~ Kerry Clark

I understand from researchers that honey bee clusters start to rear brood as the daylight gets longer, even when the temperatures are seriously cold. The Peace has had quite a weather mix this cold season: some significant snowfalls, then moderate weeks when the ground became almost bare again.

February is still too soon to know how winter survival has been. We'll hope for the best, take what we get and do what we can to have a successful year.

I was somewhat surprised to be asked near Christmas to participate in a beekeeping development assignment in Africa, including a session seeking some coordination of projects. I have been advocating for such coordination for awhile, so I accepted the task. It will have me away from Canada for February, but I will be back in BC well in time for our March meeting in Kamloops. I look forward to both the time in the tropics, and the good program arranged for the Semi-Annual.

Best Wishes to all and I'll hope to see many of you then.

Metro Vancouver
~ Allen Garr

We have had quite a soggy stretch out near the coast as January ends, which also means we have had mild weather. Not that the bees are getting out much. But it is a lot better than the cold and snow we saw last year. As of this writing, witch hazel is in bloom and the catkins are out on the hazelnut bushes.

Richmond, Langley and Surrey clubs are once again organizing the first of their two pilgrimages to Iotron, which is always a well-attended event. New Zealand packages are being sold, set to arrive on March 10, for $250. California

queens should be available by the end of March, but no prices yet.

Longtime berry grower, beekeeper and bee supply guy Bob Fisher is recovering from a serious illness that put him in hospital for several weeks; good to know that he's recovering. He decided to sell his bee supply operation, West Coast Bee Supplies, a few months back, to a fellow beekeeper and pollinator out in Maple Ridge. The fellow's name is Christian Hall. You may have met him at the trade show at our last AGM in Kelowna. The phone number is still the same. For us city folks though, the drive will just be a bit longer. Christian says he will be selling 5 frame standard nucs (3 of brood) at the end of March for $225.

The Richmond club picked up a fancy microscope, ostensibly to look at spore counts in bees' guts, which we expect may have kicked the bucket because of *Nosema*. The club also now has a second extractor, a hand crank job that is months away from being put to use.

We have had no reports yet on winter losses although some had fall losses due to wasps. We may hear more on that at February's club meeting. Folks are still applying sugar cakes to their hives, usually above the inner cover, and expect to be laying on pollen patties by the end of February.

Incidentally, given our interest in fungicide sprays on berry crops, I heard from one pollinator in the Abbotsford area who is giving up his pollination contracts because of the harm he believes the spraying has caused to his bees. He will stick with honey production, queen rearing and selling nucs later in the season. I'll be interested to hear if he is alone on this.

Meanwhile, we are hoping for some sunshine.

Terrace
~ Rudi Peters

It seems that the extremes in our weather keep getting more extreme every year. Some areas within the region have had the pleasure of having a fairly steady temperature, they just got cold and have stayed cold, while other areas have gone from above freezing and then the next day dropping to well below freezing with hellish winds. Winds that were strong enough to blow hives right off the hive stands.

What to do when the snow is blowing hard enough that you can hardly see across the street? Order bee supplies. Days go by slowly, but months just speed by. As the spring supplies start coming in there is the hope that not too far away the snow will be replaced with green grass and flowers.

During the warmer days we go and bravely check the hives and are excited when we hear the loving sound of their humming. We keep checking the long range forecast to see when we can expect to see them start their spring cleansing flights.

Prince George
~ Barry Clark

Happy New Year from the center of civilization, Prince George, 80 kms from the geographic center of British Columbia.

As I write this report at the end of January it is pretty cold here (-20) last night. We have had a normal winter so far, not as much snow in November and December, but we are near seasonal levels as February approaches. If the various weather networks and almanacs are to be believed, we just may have a better spring than last year. My fingers are crossed.

The Prince George Branch of the BCHPA held its AGM in January. We have a new co-chair (President) elected and two new directors on board. David DeLeenheer was elected to co-chair the group. Our club operates with 2 Presidents and it has worked out very well for the past year. Volunteers lead busy lives as a rule and with winter travel, summer work and other things, it has been a good experience to have 2 people sharing the work of President. Sandra Ramsay is

also a co-chair. Randy Chencharik was re-elected as Treasurer until 2020 and Roselyne Lambert was re-elected as Secretary, continuing her current role into 2020. Gwynneth Purnell will provide back up to the Secretary as required.

The outgoing Directors Kristin Vignal and Dave DeLeenheer were thanked for their service and nominations sought for their replacements. Chad McDowell and Chris Morris were elected as directors to join Wally Steidle.

The Prince George Branch has expressed a sincere desire to host the 2019 BCHPA Annual General Meeting and Education Event. This annual event has been held in Prince George twice in recent history, 1998 and 2008. 2019 seems like a good time to come back for a visit.

Projects and events planned for 2018 include Seedy Saturday on February 24th, a club Field Day in May with Diane Dunaway, the Day of The Honey Bee at the end of May at the PG Farmers' Market, Pollinator Watch events at the end of June, the BC Northern Exhibition in mid-August, and another Field Day in early September. There are at least 3 Introductory Beekeeping courses planned, and one Intermediate Beekeeping presentation planned for our area so far in 2018.

Beehive Mapping is a project the club is undertaking this year for our members. Chad demonstrated the software to be used to map hives in the Prince George area. Participation is voluntary and interested members were asked to provide the physical address or GPS coordinates of their hives to him. Chad will administrate, develop and test the software; more on this in later issues.

Not many folks have been checking their colonies. I've heard of a couple of losses so far, but it's still very early to be counting our bees! Folks are starting to order nucs and packages – the fever is building.

Until next issue, keep warm.

South Vancouver Island
~ Edan North

Beekeepers in our region were not affected by forest fires that occurred throughout the dry season of 2017. However, if there are any beekeepers out there who know of anyone who was affected financially, and was missed by any of the various forest fire funding programs, there is an extension available for receiving funding. The extension runs until March of 2018.

Victoria is hosting the BCHPA AGM this year. This AGM will be tons of fun and is an excellent opportunity to network with other beekeepers, both at the hobbyist and professional level, from around the province. The guest speakers are top notch and it should be a real treat for everyone planning to attend.

Our regular January meeting hosted guest speaker Marta Guarna. She is a Vancouver professor who is working on the theme of, "Healthy Bees, Healthy Hives 2018." Her hope is that this project will spark interest with local beekeepers to raise queen bees, reducing the need to import queens. Marta's group is looking at breeding hardy queens for sale locally and across Canada.

Our local chapter had a quiet Christmas, and our annual potluck was held a bit earlier this year than usual, in November.

By now in coastal BC, most honey bee colonies are already rearing brood. The overwintered adult bees have by this time of year reached their completed life span. This cycle can be observed best on a warmer day by gently removing one frame from the middle of a cluster. When you open up your hive, always check for any signs of illness or hunger. You may hear the welcoming sound of your bees buzzing prior to opening the lid.

While you are doing your hive checks, take a little time and do some spring cleaning. This tidying should include your bottom board. There is so much clutter that adds up over the winter months and occasionally, there is buildup that can block the entrance, so remove any debris that you find there. You must assess the debris for the presence of disease, and it is best to burn any debris that has traces of illness on it. This is especially important on the smaller islands.

It is fast approaching spring feeding time as well. Your honey bees may be hungry, depending upon food availability in your area. Some regions already have a large variety of spring blooming plants. Some areas are just catching up on creating more honey bee friendly gardens, acreages, and cityscapes. These gardens also benefit additional species of bees, like the now rare and in trouble western bumblebee. Particularly for hobbyists, having a bee friendly garden really adds to the art of beekeeping as a whole.

The 'What's in Bloom' information sessions hosted by our local plant expert Nairn Hollott will begin again in February. The 'Seedy Saturday' event is coming up in February as well; it is easy to find right in the community of James Bay. This event opens up the art of beekeeping and the art of growing a

Kathleen Suddes of Gibsons, BC sent this photo on February 4th, of a bee on a hazelnut catkin. A sunny day on the sunshine coast and her bees were out enjoying early pollen!

trendy bee friendly garden under one roof, amongst a whole bunch of seeds and springtime food supplements, such as sugar donuts made locally by one of our beekeeping experts, Heinz.

Monthly meetings for beekeepers in our region are ongoing in 2018. Enthusiasts and those who are just starting up are most welcome. These chatterbox times are still hosted on the second Thursday of every month. All the details and directions to find your way over to our information sessions and additional events, can be found on-line at either Victoria Beekeepers still on facebook, or on our website capitalregionbeekeepers.ca that includes a continually updated calendar of events. Looking forward to seeing you there.

Fraser Valley
~ Courtney White

Happy New Year everyone! We've had a fairly mild winter here so far in the Fraser Valley, so I'm hopeful that we won't see the same high level of losses as 2017 (fingers crossed). Oxalic acid mite treatments using the drizzle method continued to be popular during mid-December. Package rates are ranging from $240-$270 this year and are due to arrive in March. Nucs are ranging from $220-$250 but won't be available for some time. Not much else to report on, just patiently awaiting spring. See you at the Semi-Annual!

West Kootenays
~ Gavin Firkser

Our winter brought us straight into the pits of cold weather around Christmas time, with temperatures hovering around -20°C. Although this may have been an immediate damper to our bees, those consistent and cold temperatures allowed for killing wax moth in stored equipment. In contrast, our mid-January through to early February has been very mild with around freezing and even slightly above zero temperatures, perfectly timed to give our bees the movement they need to stay in contact with their honey.

Local club meetings have been excellent, with a very successful candle making workshop in December for holiday candles; a really social and festive way to recycle our resources for the winter months ahead. As if just hanging out with a bunch of enthusiastic beekeepers isn't exciting enough, we've been donated spilled sugar from local grocery stores which we will be raffling off, marking our first ever sugar raffle!

Club member Dave Johnson will be ordering New Zealand packages again this year, and with internationally shipped rates rising we are seeing prices as high as $250/package. This couldn't be a stronger incentive for all beekeepers to invest their time in learning the process and technical procedures used in the production of nucs, even on a small scale. We get constant requests every year for any available nucs, so let's educate ourselves and raise them locally to support the demand!

The West Kootenay Beekeepers version of the beginner's beekeeping course will run again this year through Selkirk College in Castlegar. This fantastic ride-along course was pioneered by Jeremy & Nette Lack, and consists of two classroom sessions in February followed by six monthly field days, April to September, that lead starting beekeepers through their first year. In addition, the Selkirk satellite campuses in Grand Forks and Nakusp will hold "Beekeeping in a Weekend", consisting of two classroom days and one field day that are the regular BCHPA beginners course.

Our winter should be coming to an end in the near future, yet we are all keeping our eyes out for that February cold snap. Until then, hold tight everyone, as we are looking forward to the hectic spring months shortly ahead. Stay Buzzy!

East Kootenays
~ Lance Cuthill

Winter here in the East Kootenays has been kind on the bees, at least up to the time of this report. Temperatures have been in the range of -8°C to +3°C without any severe temperature swings. We have had an unusual amount of snow for this time of year and yet today (Feb 1), it is raining in Cranbrook. The last check on our bees showed a need for extra food so fondant was put on the lighter hives. The sacks of shavings for moisture absorption were soaking wet and replaced with dry sacks.

While Mother Nature has been kind to the bees, the bears have not. We had two of our yards "beared" with a total loss of winter supplies on four hives. The good news, if a bear attack has any good to it, was that we were at the yards the following

morning and were able to gather up bees and salvage comb. Luckily for us, a fellow beekeeper sold us some frames of crystallized honey to replace most of what the bear ate. Randy, another East Kootenay beekeeper, was not so lucky. When he visited his yards, a bear had totally destroyed 25 hives. This saying came to mind: "I had no shoes and complained until I met a man who had no feet." Bears: "aaarrrgh!!!"

It was a pleasure to have Jeff and Amanda Lee attend our last East Kootenay beekeeper meeting. They will be offering the BCHPA Introductory Beekeeping course in Creston and Bobby and I will again be offering the course here in Cranbrook this spring.

Sunshine Coast
~ Allan Cobbin

This quarterly report is more about our Club activities than beekeeping in general but as you may know, we're mostly backyard amateur enthusiasts. However, having said that, we now have in residence a semi-retired commercial beekeeper from Saskatchewan who last year brought in about 100 colonies. We also have another local member who now has about 75 hives and another with more than 30, so perhaps some form of "commercialism" is starting here on the Sunshine Coast.

As with most of the province, our weather has been dreadful with rain, rain and yet more rain! No snow to speak of but plenty of wind and storms. However, we have had several mild days in February to date, so we'll hope for some continued mild weather.

At our January meeting, Sally Burke, our current President, was thanked for three years of excellent stewardship for the Club. She noted that elections were long overdue, and it was agreed that elections for Executive positions would be addressed at our next meeting. We will also discuss the possibility of re-instating monthly meetings, and changing the venue of our site to a more central and suitable location, as well as possible speakers and topics for the future.

Our next meeting will be held at the Mission House in Davis Bay on Feb. 13th. We are making tentative arrangements with a local nursery for our annually held Day of the Honey Bee (on Saturday May 26th) and together with a local service group, hope to start the day with a Honey Bee Breakfast which, along with some honey sales, will also be a Club fundraiser.

One Executive member circulated an application/renewal of membership form (mostly tick boxes) for consideration, which will enable us to access more information about apiary locations, number of colonies, etc. We also looked at a possible local winter/spring 2018 Survey (mostly tick boxes) which will request information about various treatment methods, package purchases and their performance and forage availability. These items will be discussed in further detail at our next meeting. A salute of approval was given to the Richmond Bee Club for their excellent survey. We will likely present our own findings in a similar manner.

We also had an informal discussion regarding current overwinter losses and some comments were: no losses, 1/5, 4/15, 1/12, to "lost a lot". All of our colonies at the Botanical site survived the winter well and were treated with oxalic acid. Some interest was expressed in a group purchase of offshore packages, but we will be raising our own nucs and queen cells from our Botanical Gardens site and well realize the excellent quality of our own queens.

That's about all from the currently Soggy Sunshine Coast except to note that it was Oscar Wilde who said: "The only good thing to with good advice is to pass it along…it is never of any use to oneself." A good thought for all beekeepers, especially our more experienced ones!

Thompson Nicola
~ Amber Michaud

Late winter is a crucial time for colony survival. Colonies here have been cooped up for 3 months or so, honey stores may be running low, and spring is another 2 months away. Last year 2 of my 4 hives died in the late winter. Starvation is a common reason for hive demise, but a beekeeper can provide emergency food in the form of fondant. A quick lift of the outer cover to place fondant on the inner cover by the central opening will not harm bees if done on a mild, calm day.

There are two forms of fondant: baker's fondant and ambrosia. Both are sugars but in different chemical forms. Baker's fondant is in the form of sucrose (table sugar) and is a disaccharide. Ambrosia is in the form of glucose and fructose, the two monosaccharides that make up sucrose. To break sucrose down to these two building blocks, a water molecule is needed (a process called hydrolysis). Ambrosia is also

known as inverted sugar. Human bodies and bees use glucose and fructose; therefore feeding ambrosia to bees requires less gut-action to fuel their little bee bodies. Baker's fondant is more suitable as a spring supplement when the bees can afford the extra work. That being said, I am feeding baker's fondant because that's what I have.

Issues facing the honey industry have reached the mainstream media with the production of a show devoted entirely to bees and honey on the Netflix series called "Rotten". Some of the same issues that the BCHPA are dealing with are described in this series including hive theft, adulteration of honey, and hive health concerns relating to pollination. Just substitute California and almond growing with Fraser Valley and blueberries and the show is directly applicable to our backyard.

An update on wildfire recovery in our region: One beekeeper in our region who lost 16 hives in the 2017 fires explained that loss and recovery funds are calculated per hive (bees and equipment), per bee yard (fencing, gates) and by the amount of honey lost.

The skiing is fantastic but my bees can't wait for spring!

Cariboo
~ Ann Carter

Over 40cm of snow has fallen in the last 36 hours making thoughts for a spring BeesCene report challenging! Winter in the Cariboo has included an unusual amount of warm weather with several 6-7°C days and not a lot of snow. The cold did make a determined appearance over Christmas and New Years with many days below - 20°C. Hopefully the warmer days are reducing the bees' honey consumption and stretching out the stores, which were challenging to build last summer and fall.

November's club meeting featured a very well attended and well-received "products from the hive" evening. Three club members manned stations demonstrating wax rendering, the production of lip balms and body creams, candle making and waxed cloth food wraps. Attendees left with Christmas gift ideas, both to make for others and items such as candle moulds to request for themselves!

In mid-January Diane Dunaway presented "Look Before You Leap: What is Involved in Beekeeping ", a free community information session on the costs, time and equipment needed to keep bees. Our second year offering this information session, we are aiming to have people more informed about beekeeping by our January bee stock ordering deadline. The progressively earlier nuc order deadlines have seemingly led to many decisions to order bees without adequate consideration of all that the hobby involves. One must wonder if this leads to a higher colony loss and drop out rate. Those uncertain about taking on bees are encouraged to take a beginner course and work with a mentor.

The Central Cariboo Beekeepers had their AGM on January 27th in Williams Lake. A potluck lunch was added to the event to allow more socializing and information sharing time. A full schedule of club educational opportunities and events for 2018 was presented, including two beginner courses, field days and demonstrations. Thanks to our Executive for all their efforts!

Turning our thoughts to spring, we all hope for a mild early spring with pollen and nectar making their appearances sooner rather then later. Pollen and nectar were scarce commodities last fall and the bees needed a lot of supplementing for winter. Many local beekeepers, especially those in the Spokin Lake and Rose Lake areas, have had their forage areas significantly impacted by major wildfires. One can only hope that wildflowers and flowering shrubs will rapidly reappear this year, leading to a much better season for bees and beekeepers in 2018. ❀

Classifieds

NUCS FOR SALE: Strong 4-frame nucs, full depth or dadant. These are B.C. raised bees and queens. Nucs and queens available May thru September. Contact Blair and Cheryl Tarves, Similkameen Apiaries. **250-499-2555**.

WANTED: Distributors wanted for Dadant AP23 Pollen Substitute Patties and Dry. Inquire at **dadant@dadant.com**

NUCS FOR SALE: Strong 5-frame, full depth nucs. Queens from hardy local stock. Available late May to end of August. Contact Marty Van Herk, Bear Creek Honey **604-845-1807** or email **vanherk@telus.net**

EARLY QUEENS DIRECTLY FROM CHILE: from Pacific Queens. Mated queens from January until May. Selected by hygienic behaviour, pollen production and gentleness. Contact: www.pacificqueens.com, **(+56 9) 6909 3246**

ORDER YOUR NUC TODAY. Has 3 frames of bee covered brood and a laying queen. Expected pick up date, end of May, Manitoba. Please contact: Alex for more details, cell **(204) 381-3866**, or home **(204) 326 8182** email:**alex_reich63@yahoo.ca**

FOR SALE: Spring 2018 - 100 nucs/splits, will build in your equipment or mine. Queen Cells - 80% mating success guaranteed - will refund whatever % falls short of this. Steve Clifford, Halfmoon Bay, BC. **(604)-885-9664, (306)-863-1384**.

CANADIAN RAISED QUEENS AND NUCS: Queens available March-Nov. Nucs are 4 frames: 3 of brood, 1 of pollen/honey, available April – Sept. Queens can be mailed through the postal service when needed. Contact Donna Moseanko of Wildwood Queens, Powell River: **donna.moseanko@gmail.com.**

FOR SALE: 2007 Ford F450 bee truck. Reg cab, turbo diesel, 6 speed manual, 2wd. Steel deck is 8'x14'. One year old Bridgestone rubber have 3 trips BC-SK on them. New tool box, well rigged for bees. Truck was oilfield lease-back, has only 61,000 km. White in colour, no scars, has heavy aftermarket front bumper….looks and drives great; too much truck for 150 hives. **(604)-885-9664, (306)-863-1384.**

70-80 TEN FRAME Vernon stock colonies with overwintered queens, to be ready in late May after pollination. Two such colonies full of brood will produce 5 four-frame replacement colonies when you buy three queens, or you keep them as they are for honey production, or use them to rear your own Vernon Queens. $400/unit. Call Bill in Kelowna **250-762-8156**.

FOR SALE: Queen Rearing Frame, 100% wood, handmade by Wayne Neidig, brand new, never used. $50.00 Contact Janice Bobic at **604-298-6164** or email **jbobic@telus.net**.

VSH BEES, inspected, ready through April (weather depending) with overwintered imported queens (California). Complete singles (plastic frames/waxed bodies), 4-5 frame nucs, packages, and shallows for top bar/Warre on EARLY request. Earliest bees in Canada, wintered and brood-stimulated indoors, references. **250-818-8763**.

FOR SALE: Nucs and Queens: We are offering queens and nucs from May 15 - July 15, 2018. Will hvave 600+ queens and 500+ strong 4 frame nucs available which are inspected and certified. Nucs are of 3 frames of brood, 1 frame honey, 1 young proven laying queen. Taking orders now! Contact: Matt Nagy, **250 306 9896, mightymountainhoneyfarms@gmail.com.**

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