Bee sCENE

FALL 2018
Volume 34 #3

Promoting and Encouraging Beekeeping
in British Columbia since 1920

BCHPA Website: www.bcbeekeepers.com

BRITISH COLUMBIA HONEY PRODUCERS' ASSOCIATION

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Inside:

To:

Letter from the editors . . .

A couple of weeks ago, while we were in the middle of production on this issue, I got the news that my grandma was doing very poorly; she'd been in the hospital for a little while due to a heart attack, and things had taken a turn for the worse. I was able to make it to Alberta in time to see her before she passed away and am thankful for that, but it's a sad time for our family. Baba was my dad's mom. She faced a lot of hard times in her life but never lost her sense of humour. She raised 8 kids and ran a big working farm and I don't think she ever complained. She never took any crap from anyone and you couldn't shake her. Because of this a certain kind of person was drawn to her, those in need of shelter. She always said that you just have to face it when things get tough, and she said it in a way that left no room for doubt.

Although she was living on her own until she was 90, she didn't spend too much time looking in on herself. Her favourite spot was with her elbows on the kitchen counter near the sink, looking out on the street outside. Her street won't be the same without the pretty white haired lady in the window. We'd been mailing copies of this newsletter to her for the last few years and she always liked getting them, and was surprised at all the things she didn't know about bees. I've been talking to my uncle since she died and am likewise surprised at how many things I didn't know about the family, and there's lots more that I'll never know. It's the same with keeping bees - we're only able to see a few parts of the bigger picture.

Baba would have made a great beekeeper and now I wonder why I didn't take a couple of hives out for her. I was out on the farm with her while she was slaughtering chickens when I was pretty small, and she spent the afternoon being mobbed by wasps, totally undeterred, while I hid in the old farmhouse a few feet away. I think she would have appreciated having some honey bees and I imagine she would have been comfortable with them right off the bat.

After her funeral, we went up to the farm which is located near Myrnam. Baba had been living in town for many years, and the only work being done on the homestead was to keep the garden going and the grass mowed. The buildings are all falling to the ground, and are now home to an assortment of wild animals. Although it bothered her that those old structures were in such a state, she liked that the place was sheltering those in need. One of the photos here is of the barn, taken by my sister on the day of the funeral. The skies had been pretty smoky in Alberta since I'd arrived, but on that day they cleared, and she got some lovely shots of the old place. The other photo is an older one of Baba, kind of a funny photo to share but one of my favourites.

The same uncle that's been teaching me some family history happens to have a way with words. He had a look at my sister's photos of the farm, and the clear skies that gave such a nice light that day stirred his memory. Seems fitting for him to have the last words here:

'I see the faces in the old photographs of the boys...boys? Hell they were men, straining on the ropes in knee-deep grass to lift those beams in place. I remember the organic smells, the buzz of the flies, the taste of fresh milk, the sting of the cow's tail as it smacked you across the face, and I think of how vital and healthy we were. Each of those photos communicate a time of hope, when a century was born, and a poignancy, when a century had died. What would Baba say? "We were just a lot of people doing the best they could, just a lot of people doin' the best they could." And then she'd say, "They did it pretty up and walkin' good."' ❀

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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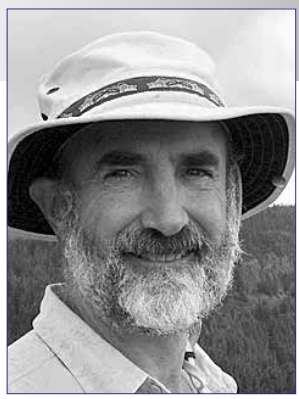
In This Issue

Our cover story:
The sun is just starting to come up over Agassiz, as a team of researchers involved in the blueberry and bee health study get to work. *Photo by Abigail Chapman*

From the President



Kerry Clark
BCHPA President

Breaking news just before printing: In the first two weeks of August, the wildfire situation in BC flared up. By the second week we have more wildfires than the devastating 2017, though the total area is less. Some regions like the Cariboo, who were hit hard last year, have problems again: thousands of people with property damage or having to be evacuated. Among them will be beekeepers. Our Best Wishes to all affected, and hopes that all will be safe.

Other than that, 2018 has been a year of remarkable benefits to the beekeeping community in BC. After meeting with the BCHPA executive in September 2017, Minister of Agriculture Lana Popham let us know, in November, that the Ministry of Agriculture would provide the BC Honey Producers' Association with funding of $25,000, to support our efforts in research to ensure the health of beekeeping and the honey bee colonies of BC. Honey bee pollination adds value to BC's crops, at the scale of hundreds of millions of dollars per year, so a provincial investment in a sustainable, ongoing economy seems like a good one.

Members of our Association were very pleased in March 2018 when Minister Popham announced that the $25,000 would be an annual funding to the Association. The Association has the opportunity and responsibility to use this funding to support important work. This year, that funding has been magnified to a value of $140,000 by contributions from partners such as UBC, Agriculture and AgriFoods Canada, the National Bee Diagnostic Centre, and the BC Blueberry Council. A report about the progress of the work which was made possible by these funds can be found in this issue.

We have just been informed by the study's lead scientist, Dr. Marta Guarna, that in spite of the very favourable weather in the blueberry pollination season of 2018 (adverse weather was claimed by some to explain the beekeepers' observations of increased EFB) the concerns of beekeepers regarding the health of their colonies in blueberry pollination have been validated. Preliminary results show a clear difference between groups (in and out blueberries) not only in the number of colonies with EFB-like symptoms but also in the severity of disease. Dr. Guarna will be providing more details of the research in a report (including the prospects of resolving the problem with nutritional supplementation) on October 26th at our annual education day in Victoria. We have invited Minister Popham to attend any part of the meeting she may choose.

We realize that some in the media seemed to focus on a possible conflict or hostilities between beekeepers and blueberry growers, but we have always approached the situation as a challenge shared by all of BC's agriculture sector and economy, and have worked with partners to collaborate in finding a solution of benefit to all.

A second initiative that the beekeeping community in BC may benefit from, was the announcement, as part of Day of the Honey Bee, of the Bee BC program ($50,000 for each of two years) that will support small projects (to a limit of $5,000 each) oriented to the betterment of bee health and community beekeeping throughout BC. We at the BCHPA look forward to hearing about more of the projects accepted by Investment Agriculture Foundation for this support. We hope that the selected projects will be announced at our October meeting, and that they will generate even more great ideas for the second year of funding.

In addition to these two worthy initiatives in support of honey bees in BC, we are encouraged to know from Minister Popham that the Apiculture Program will be maintained and improved, with new Apiary Inspector positions recently announced.

Arrangements for our Annual Meeting and education days are well underway and the registration page is now active at beeexcellence.ca An optional course in Honey Judging will also be held on the afternoon just prior to the Friday business meeting. See an announcement elsewhere in this issue. Victoria is a very pleasant place in BC in October. I hope you will consider attending the convention. ❀

Bees be with you,
Kerry Clark

NOTICE OF ELECTIONS

Positions up for Election at this year's AGM in Kelowna:

President
Treasurer
CHC Representative

Please send the names of those you wish to nominate for these positions to
Nominations Chair, Dan Mawson:
secondvicepresident@bcbeekeepers.com

Beelines

News from the Ministry of Agriculture

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

Day of the Honeybee, May 29, 2018
With the support of the Hon. Minister Lana Popham and her office, BC beekeepers had an opportunity to showcase their products and industry on the "Day of the Honeybee" in front of the Legislature Building in Victoria on May 29. During the morning hours, a cold wind caused doubt about its success. But then, as the noon hour approached, warm, sunny conditions appeared that brought out the public and many provincial politicians. In fact, Premier John Horgan and various cabinet ministers came out to learn about bees, beekeeping and their critical role in the environment. Additional entertainment was provided by Jeff & Amanda Lee with their newly-acquired hive loader which the Premier and Minister had a chance to try out. Minister Popham also used the occasion to announce the two-year BC Bee Program of $100K in support of small-scale, community-based projects to enhance bee health. The day was a true success.

BC Bee Program: Small-Scale, Community-Based Projects
Within a matter of weeks after Minister Popham made the funding announcement of the BC Bee program on May 29, beekeepers and groups applied for funding support of a wide-range of projects. 17 proposals were submitted for the maximum support of $5K each. The application period for this year is now closed and we are awaiting confirmation on which projects have been approved.

Big Change to Veterinary Drug Policy
As reported in previous issues, the federal Canadian Food Inspection Agency (CFIA) will enact new policies concerning the availability and distribution of veterinary drugs on December 01, 2018. Since the mid-1950s, beekeepers have been able to purchase oxytetracycline (Oxytet, Terramycin) over-the-counter from bee suppliers and similar sources without prescription or veterinary oversight. The threat of increased antibiotic resistance involving animal and human diseases has caused the federal government to develop regulations that will make it harder and more costly for producers to access these drugs (please note that the US EPA has initiated a similar program). As of December 1, 2018 a veterinary prescription will be required for the purchase of any veterinary antibiotic including oxytetracycline.

Most commercial beekeepers are expected to establish a relationship with a veterinarian who will issue prescriptions. For hobby beekeepers the new policy may be a challenge as the costs of a veterinary consultation, prescription, dispensing fee and medication will quickly exceed the value of the few hives that need treatment.

The Ministry of Agriculture is currently exploring ways to make it easier and affordable for beekeepers to purchase small quantities of oxytetracycline for the treatment of colonies confirmed with brood diseases. Our current efforts are not intended to promote drug use but only to make access less onerous and costly.

The restricted access to oxytetracycline in the future may have less of an impact than anticipated. According to the recent spring survey, BC beekeepers use far less antibiotics than previously assumed. Only 13% of survey participants indicated that they had used oxytetracycline last year.

Independently-minded Beekeepers vs Communal Bees
No matter how veterinary drugs can be obtained in the future, a reduction in their availability and use will be inevitable. The most effective method to reduce drug dependency is by improved beekeeping management. But it is well-known that beekeepers are an independent lot with many divergent views and opinions about how to manage their colonies. With no barrier of entry, any person can start keeping bees and enjoy the freedom to manage them according to their own ideas, theories or philosophies. The worst thing that could happen is the loss of the colony but then, there is always the option to buy new bees for the next year.

Even though beekeepers may have the individual freedom to manage their bees as they see fit, our inspection results and surveys show that many colonies are lost due to poor

management and neglect. The losses are not just affecting the beekeepers themselves but also colonies of other beekeepers. Colonies overwhelmed by disease or poor management go through a protracted period of decline and during this period, many bees move to other colonies. When a disease is involved, it can be quickly introduced to other colonies and other beekeeping operations. Please remember that unlike their keepers, bees are communal in everything they do.

To reduce colony losses and maintain healthy bees while reducing the dependency on drugs and chemicals, beekeepers must shift their management away from just keeping bees towards the management of bees and pests. Colonies face more diseases and pests than ever before and the threat of their introduction is present at all times. Frequent monitoring for disease and applying remedial action at the earliest stages of disease development are key components to effective management. The ultimate aim of the Apiculture Program is to turn each beekeeper into his/her own bee inspector. Hence, the Ministry offers an introductory beekeeping course for free, with a strong emphasis on disease detection and control. While beekeepers can still manage their bees in any way they like, with better training in disease control more colonies will be healthier and more will survive.

The Value and Necessity of Registration

Beekeeper registration is a legislated requirement under the Animal Health Act, but why? The Ministry of Agriculture doesn't maintain beekeeper registration for the sake of bureaucracy. The main reason for registration is for the Ministry's Apiculture Program to assist the beekeeping community in the prevention of diseases and to mitigate their impact. A key component of administering animal health programs is to record the inventory and distribution of livestock, including honey bee colonies throughout the province. This data base enables the Apiculture Program to deliver its inspection and extension services, all of which are at no cost to the beekeepers. For BC to have the authority of regulating the import of bees, be it from another province or another country, the province must maintain a credible registration system. Additional uses of the data base include seasonal and annual surveys. The narrowly-defined purpose of the beekeeper registration system prevents the data to be used for anything else.

I urge beekeepers to register and update their registrations, because the impending changes to the policy of veterinary antibiotics may require up-to-date beekeeper registration as a condition of obtaining a prescription.

New Apiary Inspector - North Okanagan / Shuswap

Doug Gordon, Apiary Inspector of the North Okanagan/ Shuswap had indicated that his beekeeping business was demanding more time and attention than what he could offer to carry out inspection work. To find a suitable replacement, Doug offered to assist in the search of potential candidates.

It is with great pleasure that I introduce Stephanie Taylor of Kelowna as the new Apiary Inspector of the North Okanagan/ Shuswap, who will start in the spring of 2019. Stephanie brings a wealth of beekeeping experience as she has been involved in hobby and commercial beekeeping in Canada and abroad. The starting date of her inspection work is not until next spring because she will be out of the country until then.

I also would like to take the opportunity to thank Doug for his dedication and highly energetic, enthusiastic delivery of inspection and extension services to the Okanagan and Shuswap beekeeping community. I am confident that with the same dedication and hard work, Doug will do well in his beekeeping operation. Best wishes!

New Apiary Inspector Position - East Kootenays

Axel Krause, Apiary Inspector of the Boundary – Kootenays region, has had to service a huge inspection area with beekeepers spread from Grand Forks all the way to Golden. To deliver inspection and extension services to such a large area inevitably resulted in a large proportion of resources spend on travel instead of opening hives. To improve efficiency and service, we have received approval to seek a suitable candidate that can provide inspection services to beekeepers of the East Kootenays.

The plan is to fill this new position before the start of the 2019 beekeeping season. For anyone interested, please contact me by email (paul.vanwestendorp@gov.bc.ca) for further details.

After Harvesting Honey, Check for Mites and Diseases

Beekeeping conditions today demand the management of bees AND pests. If you don't monitor for diseases regularly throughout the production season, there is a good chance you will lose the bees. But what should be done after the honey has been taken off?

Much of the success of disease management depends on timing. Beekeepers are always hopeful for a fabulous late-season honey crop but it rarely materializes and if it does, it often comes at the expense of the bees. Multiple-year studies in the 1970s showed that the honey season is done by the middle of August. While the date may vary from year to year and between different areas, it is safe to plan your honey harvesting for mid-August. While bees are likely to continue foraging well into September, weight gain is unlikely as the large bee population consumes as much as what foragers bring in.

When you have removed the honey, test for mites and inspect the brood chambers for diseases. In late August, weather conditions tend to be favourable for effective mite control and disease management. Remember that adult bees raised in September are the wintering bee population. They are needed to keep the colony alive for the next five to six months and nurse the brood raised in early spring. To do so, they need to be healthy, well fed and free of disease. Suppressing mite levels after honey harvesting may be a good thing but it is essential to check for mites after the treatment has been completed.

Also, keep track of the weather conditions after treatment. Sometimes we have excellent late summer/early fall weather conditions that will keep bees foraging and visiting each other. This means that mites and other diseases are still transferred to other colonies, including colonies that recently finished their mite treatment. When too many adult mites winter with the bees, they will parasitize most of the early spring bee brood, preventing the wintered colony from replacing older bees. If mite levels are high in the fall, either apply a 6-week Apivar treatment with strip removal scheduled for early December, or an oxalic acid treatment in early December.

Herbicides and Bees

In recent times, beekeepers have increased their opposition to pesticide spraying, be it by farmers, homeowners or local governments. Pesticides are by definition, poisons designed to kill pests. But "pesticides" is an all-inclusive term for a huge variety of pest control products. There are fungicides, miticides, avicides, rodenticides, nematocides, insecticides, herbicides, etc. and each of those categories includes a list of products of different composition, mode of action and toxicity profile.

Insecticides are designed to kill insects and most impair the insect's nervous system. So do rodenticides and avicides that control rodents and bird pests respectively. Herbicides on the other hand, have a different mode of action and don't pose an acute risk to bees. Modern herbicide formulations act as synthetic plant hormones. The main environmental concern of herbicides involves their impact on aquatic wildlife.

Some regions of BC have experienced serious threats of invasive weed species over the years. Some weeds may reduce the productivity of rangelands, while others are toxic and pose a health threat to cattle and wildlife. Other weeds may aggressively invade a habitat and threaten the sustainability of the local ecosystem. But then, some of the most invasive weed species are valuable nectar and pollen sources for bees. Spraying flowering weeds may result in the immediate loss of a valuable nectar or pollen source, and it also often causes beekeeper anxiety about the potential of bee poisoning.

There is little danger of foraging bees collecting sufficient amounts of nectar and pollen from herbicide treated weeds to have a toxic effect on the colony. Herbicides by their chemical composition and mode of action pose little threat to bees and pollinators but also, after they have been applied to a bee forage source, the plants will quickly wilt and display abnormal signs. Recently applied herbicides also have strong bee repellency. So, while it is possible for a few foraging bees to collect small quantities of herbicide-tainted nectar or pollen, the total quantity and short duration of collection are unlikely to have any impact on the colony.

Regional invasive pest councils that are responsible for weed control on crown land operate under strict guidelines, permits and label instructions. Herbicide application is only one control method as other strategies including mowing, plowing, pulling and burning are also widely used.

I'm not promoting the use of herbicides or dismissing their potential impact on the environment. However, it is important to remember that not all pesticides are the same and that the appropriate application of herbicides does not pose a serious risk to foraging bees. ❀

~ Paul van Westendorp
BC Ministry of Agriculture

BC Honey Producer's Association CERTIFIED HONEY JUDGING COURSE October 25, 2018

This practical, four-hour course will provide information, practical demonstrations and a printed honey judging manual. A BCHPA certificate will be issued to those who complete the course.

WHEN: Thursday October 25, 2018 - 1:00 pm to 5:00 pm, one day ahead of the BCHPA AGM.

WHERE: Union Club,
805 Gordon Street, Victoria.
Meeting room #1 on the 1st floor, just above the main floor.

COST:
Current BCHPA member: $100.00
Non-member of BCHPA: $140.00*
*Includes BCHPA membership for 2019

PRE-REQUISITES: The course is designed for beekeepers with years of experience, including exhibiting honey. Participants should bring a jar of their own honey to judge and if possible, a sample of rendered beeswax, cleaned pollen and creamed honey.

Participants who have specialized honey judging equipment (polariscope, colour classifier, refractometer) should bring them as well; this is a hands-on course!

REGISTRATION:
Limited to 12 maximum / 6 minimum
Must register by October 1st, 2018
Register at the BCHPA AGM webpage
victoria.beeexcellence.ca

INSTRUCTOR: Larry Lindahl

bee notes

SAIL Award - Food for Bees

The SAIL Award recognizes employees who go out of their way to advance sustainability in core BC government operations. The award thanks and honours individuals who make a regular habit of sustainable behaviours in the workplace.

Paul van Westendorp, an apiculturist and 2017 SAIL Award recipient, was recognized for his work on the 'Food for Bees' initiative. It is a Ministry of Agriculture program which promotes the planting of bee forage on public and private lands, to support wild pollinator populations.

Each SAIL Award recipient is honoured with a legacy gift intended to support their sustainability efforts into the future. In Paul's case, an interpretive sign for the pollinator and nectar forage garden at the Legislature in Victoria was installed; it now informs visitors about the diminishing bee population and the importance of supporting pollinators.

The pollinator and nectar forage garden at the BC Legislature was the result of a public design contest held in April 2017. The educational sign enhances this beautiful bee-sustaining environment. *~ Shay Shrestha*

A couple of young bees sporting their hairdos on the first day on the job attending Mom. This colony's emerging and young nurse bees are some of the furriest bees I've ever seen. Could it be a bonus with winter coming on in a few more months?

~ Garret Wilkinson

Sunshine Coast Beekeepers take part in the Canada Day Parade

I am sending you some photos of our bee club participation in the Canada Day Parade this year. It was the first time for our club to do something like this. One of our members (Steve Clifford) provided the "vintage" flatdeck bee truck, a local garden centre loaned us some flowers and plants to decorate the truck and we had "little bees" from our June kindergarten education program that we host at our demonstration yard. We had costumes of black T's with sewn yellow stripes, headband antennae and some of our beekeepers suited up. We even had "honey" candy to hand out.

The kids had fun - we wound up on the front page of "The Local", one of our regional newspapers...and the best part is, we were able to be very public about letting the community know we are here.

~ Kathleen Suddes

Beekeeping Bylaw in the City of Vernon

From left to right: Doug Clay (beekeeper), Keith Rae (President North Okanagan Beekeepers' Association), Ed Nowek (Owner, Planet Bee Honey Farm), Jane Weixl (Sustainable Environment Network Society), Dawn Tucker (urban beekeeper) and Heather Clay (Urban Bee Network).

Photo courtesy of Heather Clay

Beekeeper Dawn Tucker was recently forced to remove her honey bee hives from their location in downtown Vernon. The local bee bylaw restricts beekeeping to RR1 and ALR zones, effectively excluding most properties in the City of Vernon. She has kept bees at the same location for 5 years with no issues. It is not known who complained. Her neighbours have always been interested and supportive of her hobby. Until now there have been no problems for any of the people keeping bees in the city but clearly the bylaw enforcement people are no longer turning a blind eye.

Dawn decided it was time to approach council with a recommendation to update the bee bylaw. She requested help from Urban Bee Network. Together we gathered support from beekeepers and others interested in pollinator protection. It was a group effort to support Dawn with her bylaw contravention issue. Many more who could not be at the council meeting sent letters of support.

In preparation for the council meeting we found a copy of a complaint letter from 2005. It seems that today's bylaw was put in place because a Peace River commercial beekeeper used to overwinter 400 colonies at his mother's place within the city of Vernon. The bees were a big nuisance to a nearby storage business. After multiple complaints the city imposed a restrictive bylaw in 2006.

Fortunately times have changed and urban beekeeping is better understood. The councillors today were well informed from the package of information that was dropped off to them in advance of the meeting. Their response to the delegation's presentation was positive. It is just the beginning of a lengthy legal process that will involve formal recommendations from City staff, and then 3 readings of the bill, before a final vote. Vernon beekeepers are hoping for a change to the bylaw that will allow beekeeping in all zones subject to reasonable conditions.

~ Heather Clay

Bee Health in Blueberries

An amazing effort was made to get this project off the ground and complete the field work in the short window of time we had to design, plan, and organize it before this spring blueberry bloom. This was possible because of the participation of Leonard Foster, Ali McAfee, Heather Higo, Julia Common and Gerry McKee during project planning, Heather Higo's incredible field management leadership, volunteer and supplies coordinator Bradford Vinson, dedicated beekeepers and the enthusiastic help from BC and AB collaborators and volunteers. We inspected and sampled over 150 colonies at three different time points in two provinces.

Abbi Chapman, Jeff Pettis, Alexandra Sebastien, Ryan Riley, Heather Higo, Marta Guarna, Steve Bayley, Mike Munro, Bradford Vinson and Abdullah Ibrahim.

Photo Alexandra Natasa

In the field, we had help from members of the UBC and AAFC teams, including the expert eyes of Dr. Abdullah Ibrahim. We also had expert help from Dr. Jeff Pettis (former USDA) and Alberta Apiary Inspectors.

This project has also been possible by the contributions of participating beekeepers Julia Common, Peter Awram, John Gibeau, Frank Schimunek, Steve Bayley, Mike Munro and Fernando Sanchez. We also had help from blueberry growers, the NBDC, as well as funding from the Canadian Bee Research Fund, BCHPA, BC Blueberry Council and Project Apis m.

~ Marta Guarna

Julia Common.
Photo Heather Higo

West Kootenay Field Day

by Axel Krause

I teach a Beginner's Beekeeping Course through the Continuing Education department of Selkirk College here in Castlegar. I have two classroom PowerPoint sessions in February to cover the basics and then I run 6 field days, one per month from April to September, to take the beginner beekeeper through their first year of beekeeping. This course was not my idea - it was originally developed by Jeremy Lack and his wife Nette, who had a small nursery farm between here and Nelson. They had an apiary at their farm and taught the course there.

Unfortunately, Jeremy died suddenly several years ago and Nette eventually had to sell the farm. After Jeremy's death, Nette asked me if I would join her in teaching the course, which I did, and we ran it for several years together. Since then she has become a grandmother several times and wanted to spend more time with her family, so she released the course format to the West Kootenay Beekeepers, our local BCHPA branch.

I have continued to teach the course since then with the help of my daughter, Bronwyn, who is looking through the microscope in the photo here. She has her degree in Microbiology which is handy, and of course I'm a retired biology teacher. The fellow in the background is well known to a number of BCHPA folks. He is Dr. Peter Wood, who is the retired biology professor who taught at Selkirk College for most of his career, in fact in the very room in which we held this session. I was in his class in 1970-72 and it was because of his interest in bees that my father and I got into beekeeping. Peter was the president of our West Kootenay Beekeepers several years ago, followed by Nette Lack, and now I have taken that role on as well.

Our field days for the course are:

- April - spring check, getting your bees, mite treatments
- May and June - swarm control, catching swarms, preparing for the honey flow
- August - extracting honey
- September - fall management, mite treatment, getting ready for winter.

The July field day was always...what do you tell folks, "Put more boxes on your hives?" Not to mention that it might be close to 40ºC in the bee yard, so I thought since I was working through the college, I could get access to a nice air conditioned lab and do a lab session instead.

We start with the stereo microscopes which are lower magnification and easier to handle. I have folks look at their fingernails, finger prints, and other objects that they bring along like jewelry or coins, etc. Then I provide pin-mounted worker and drone bees, and wasps. Did you know that if you freeze drones to kill them, many of them evert their penises? Always an interesting thing to look at under the microscope, and a great conversation topic.

The college has prepared slides of honey bee parts in their slide collection - wings, legs, heads, and stingers with venom sacs, which we also look at under the stereo microscopes. We then use these same prepared slides and move to the compound microscopes, which have much higher magnification, so folks can see more detail.

Finally, we grind up some bee abdomens to look for *Nosema* spores in the bee guts. So far I've been "lucky" to always have some sick bees so participants can see the spores. As backup, Carlos Castillo at the National Bee Diagnostic Centre has been kind enough to send me a sample tube of *Nosema* spores in case we find no sick bees. ❀

Native Bees at the Science Fair

by Lynn Westcott

In the spring of this year, Smithers, BC high school student Tess Wellington wanted to do a science fair project on solitary cavity-nesting native bees. After much research and consideration she focused her study on testing different artificial nest types which she made herself. The nests were set up next to each other to reduce the effects that placement in different sites might have on the attractiveness of her nests to the bees. In the end, it appeared that the bees - which were most likely a species of mason bee belonging to the genus *Osmia* - preferred a wooden nest block with a roof.

Tess made 4 different types of nests: the first one was a large soup can with bamboo paper straws inside of it, with cotton batting to keep the straws in place. The second one was the same, but with a yogurt container instead of a soup can, and the third was also the same, but with a glass jar. The fourth one was different - it was a piece of wood with holes drilled into it, and she placed bamboo straws in the holes to keep the dust away from the eggs.

Tess says: "I chose native bees because at a local store they were selling bee houses with hibernating mason bee eggs in them. I made all my bee houses to attract these bees because the purpose of my experiment was to see what material mason bees prefer. I thought that they would choose the wooden one (they did) because of how superior it was to the other nests."

There are two reasons why she decided to study bees: "Honey bees are being publicized a lot recently and I decided that I'd like to help native bees be protected. The second reason is that Lynn Westcott had come to do a demonstration on native bees at the library, where I volunteer. I found the demonstration interesting, so I thought to research it more."

She believes that the bees chose the wooden nest because it had a roof, even spacing between the straws, and drawings to help the bees find their nest. Tess also says: "There are bees still living in the nests. The nests I made were made specifically for mason bees, so other bees would not go in it - it would be too small. However, my project for next year is to study different native species, and try to find out which ones are in my local area."

Tess's project garnered two awards at the Northwest Regional Science Fair held in Prince Rupert in April 2018: Tess won the silver in her category at the regional fair, along with a small cash prize, and she also won the award provided by the British Columbia Institute of Agrologists. While those awards themselves were an outstanding result, perhaps even more exciting was that Tess's success at the regional fair won her a trip to attend the National Science Fair in Ottawa in May 2018. More accolades came to Tess at the national fair, as she won one of the bronze awards in the junior category.

Of her science fair experience, Tess said: "I really enjoyed science fair. I got to go to Nationals in Ottawa to present my project to the judges, and the judges were really nice. They offered a large selection of interesting STEM [science, technology, engineering, and math] activities to attend. I would love to go back to Nationals again next year." Tess is currently working on her project for the 2019 regional science fair. To those of us who are long past our science fair days and well along in our careers, it is inspiring and heartening to see youth engaging not just with science, but with an interest and focus on insects, especially native bees. Here's hoping more kids follow Tess's example and put their skills and talents behind science fair projects with a natural history focus. Given the challenges faced by our native pollinating insects, it is a delight to see Tess's interest in these important and fascinating little animals. ❀

Bee Research Update from UBC

by Ali McAfee

Good research takes talent, curiosity, and grit. Luckily, the students in Leonard Foster's lab have all of the above. Two new students have joined our fleet in the past year, bringing the running total of aspiring honey bee researchers up to five. These brilliant women are pursuing diverse research projects, including anything from finding missing honey bee genes to engineering gut microbes to better serve their host.

These five women represent no less than five different countries, bringing their unique knowledge and experiences together to one place. In addition to their own research projects, the team of students also makes up part of the field-work engine that powers bigger projects such as the honey bee health in blueberries study, covered elsewhere in this issue of BeesCene, and the on-going selective breeding project. These students are the future of research. Learn more about them below.

Mopelola (Lola) Akinlaja
Lola moved to the United States from Abuja, Nigeria, to complete her BSc in Chemistry at Indiana State University. After spending some time working as an analytical chemist, she joined the Foster lab to begin her PhD in Biochemistry and Molecular Biology. "I am investigating host-pathogen interactions between honey bees and the parasite *Nosema*. Hopefully, the information will help provide more treatment options for *Nosema* disease." She has also initiated a long-term colony monitoring project to track how colony health may respond to changing environmental variables year-to-year.

Sofia Romero
Sofia attended the Monterrey Institute of Technology in Mexico, where she studied Biotechnology Engineering for her BSc degree. Originally from Orizaba, Mexico, she has joined the lab to pursue her Master's degree in Genome Sciences and Technology. "I always have liked the idea to connect science with agriculture, particularly biotech with agriculture," she says. She is interested in studying the honey bee microbiome and is working on engineering gut bacteria to strengthen the bee's immune system. Sofia is supported by a Mitacs scholarship and a scholarship from the National Council for Science and Technology in Mexico.

Abigail Chapman
Abbi moved to Vancouver from Manitou Springs, Colorado, and is entering her final year of a BSc in Biochemistry and Molecular Biology. She has already been working in the Foster lab for two years. "I've had a huge fascination with bees for as long as I can remember, and after getting to spend more time with them through lab work I'm falling in love more and more." For her honours thesis, she has chosen to study how honey bee medications and supplements, such as oxalic acid and probiotics, can impact the gut microbiome and innate immune system. Abbi's research is supported by the Boone Hodgson Wilkinson Trust Fund of the B.C. Honey Producers' Association.

Alexandra Nastasa
Alex is a Co-op student entering her final year of a BSc degree in Biophysics. She is interested in bioinformatics and has been using her skills to try to identify missing genes buried in the honey bee genome. Originally from Iași, Romania, she first started learning about honey bees on the family farm. "My grandfather used to keep bees, and I remember helping him build frames and extract honey. The meeting of these fascinating animals and science was irresistible for me." After finishing her BSc, she is hoping to begin graduate school. Alex has received awards from the BC Proteomics Network and the Center for Blood Research to help support her projects.

Alison McAfee
Ali is originally from East Cracroft Island, BC. She completed a BSc in Biochemistry and Molecular Biology at UBC and started a PhD in Genome Sciences and Technology in the Foster lab in 2014. Her research has focused on Varroa and hygienic behaviour. She plans to graduate later this year and begin a post-doctoral fellowship through North Carolina State University, where she will study what keeps honey bee sperm alive. "I can't believe I'm almost done. I'm so happy that I get to continue studying this awesome creature after I graduate." Among other awards, she has been supported by the CAPA Student Merit Award and the inaugural AS Atwal Scholarship in Pollinator Research. ❀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The Native Honey Bees of Bhutan

by Allen Garr, photos by Joan Anderson

Last March we made a bucket-list trip to Bhutan, the kingdom where instead of measuring gross domestic product, they measure "gross domestic happiness." It is a tiny Buddhist country not much larger than Vancouver Island, tucked away in the Himalayas, southeast of Nepal between India and the Chinese controlled territory of Tibet.

It is the only country that boasts a negative carbon footprint thanks largely to a dictate by the king - who controls a series of key political appointments including the prime minister - that 80% of the land be kept in its natural state

It is indeed a mellow country. While car and truck traffic can be dense, and the narrow mountain highways seem most precarious, there is no evidence of road rage. And there is not one single red stoplight in the whole country. Actually, there was at one time a stoplight at a major intersection of the capital city of Thimphu. That was replaced some time ago with a police officer in full uniform, down to his white gloves, mounted on a podium in the main intersection, elegantly directing traffic.

Bhutan provides extremely limited access to the outside world. Television came to Bhutan in the late 90's, and of course cell phones are now ubiquitous.

All but Indian citizens require entry visas and must either be there as consultants and guests of a government department, or tourists under the watchful eye of a government approved guiding company.

Our primary purpose for being there was bird watching. What made that unique was the fact that many of the species were what are known as "altitudinal migrants". So instead of heading south for the winter and north in breeding season, they go to higher or lower elevations depending on the season. For that reason our guide carried a small altimeter attached to his belt so we could figure out what we were likely to see. And with that in mind we covered territory from 400 meters in elevation and a steamy 30 degrees Celsius, to 4,000 meters where we were standing in snow.

In the end, I could not resist checking out what was going on with honey bees in this extreme topography. *Apis mellifera*, the honey bee used commercially throughout most of the rest of the world, was only introduced to Bhutan from India in 1986, and we did see some hive boxes on farmland on valley bottoms.

However it was the wild honey bees that proved most interesting. We bumped into them first at about 1,000 meters but they can be found up to at least 3,900 meters. They were either *Apis dorsata* or *Apis laboriosa*. In Bhutan they are commonly called "rock bees". Unlike *Apis mellifera* or *Apis cerana*, which are common in India, rather than seek out cavities to set up house, these two species of native wild bees are "open air nesting" bees. The ones we saw formed their nests out in the open under rock overhangs and were usually near a water source, of which there are many in this mountainous region.

Nearby these nests, by the way, you will frequently see a small yellow-rumped honeyguide perched on a branch. For millennia these birds have assisted people hunting for wild bees and their honey stores, feasting on what the humans left behind. While exploiting that resource is forbidden in Bhutan, apparently because of Buddhist principles, it is still a common practice in India and Nepal.

You may also see, as we did, blue-bearded bee-eaters uninhibited by any religious compunction, cruising back and forth and picking off bees which were coming and going.

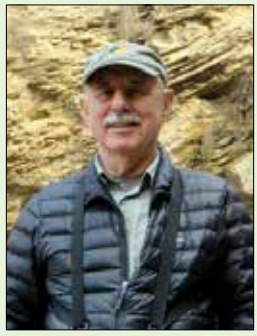
Rather than form comb in many layers separated only by "bee space," like *Apis mellifera*, these bees make a nest which is a single sheet of comb, a foot or more in length.

From a distance it looks black, but on closer inspection what you are looking at is a blanket of bees, described in scientific literature as a "curtain" a few bees thick, that only touches the comb on its edges but is far enough away from the comb to allow nurse bees and the queen to move about in a sheltered space. In each location we saw several of these combs, each comb being a separate colony.

There is one other thing that makes these bees unlike *Apis mellifera*. They not only swarm, as you might expect, they also migrate, again, according to the literature: "at least twice a year." Queen cells are formed at the lower edge of each comb and as queens emerge, swarms occur. Those swarms locate near the mother colony. But, when "environmental conditions deteriorate," the whole colony will abscond to "seasonal alternative nesting sites."

When environmental conditions change sufficiently, the colony will once again abscond, returning to their original spot. So, "the same nesting sites are occupied year after year." And unlike our domestic honey bees, there is apparently no period when the hives slow down, or the queen shuts down for an extended period.

The swarms, which also migrate, do not return to their original "natal" site. They return to the spot they originally landed as a swarm and where they left behind a single white sheet of comb, possibly a yellow-rumped honeyguide, and a blue-bearded bee-eater looking for lunch.



Allen Garr is a long time journalist who currently writes a column on civic affairs for the Vancouver Courier. His work in promoting urban beekeeping won him the City of Vancouver Greenest City Leadership Award. Allen is also an avid birder and has traveled to countries around the globe to pursue his passion.

Stop the Spray BC

by James Steidle

In a province heavily involved in forestry such as ours, many beekeepers in the Central Interior find themselves in areas where forest companies and government agencies engage in herbicide spraying. We've sprayed or manually brushed over 1.3 million hectares of forest across the province since 1980, an area a third the size of Vancouver Island. We still spray around 15,000 hectares a year today, mostly in the Central Interior.

The herbicide is typically glyphosate, which is mixed with unregulated heavy duty surfactants that make the glyphosate more effective, and also more toxic. The purpose of the spraying is to wipe out the commercially useful but unwanted trembling aspen, which naturally grows in disturbed areas, so that coniferous trees, primarily lodgepole pine monocultures, can thrive.

The Stop the Spray campaign started in 2010, after my parents, Walter and Susan Steidle, negotiated with BC Timber Sales not to spray around their apiary in the Punchaw area, southwest of Prince George. This led to discussions with herbicide applicators and foresters, and then further investigation with renowned forest scientists including Suzanne Simard. The evidence suggested there was poor science justifying the practice, which led to the founding of Stop the Spray BC the following year.

Kilometre 22 on Blackwater Road, sprayed in 2012. Notice the red and sick looking fireweed, dead moss and brownish vegetation, 6 years later. *Photo James Steidle*

Once sprayed, trembling aspen die or are permanently stunted. Research carried out in the Prince George area has shown that glyphosate does not break down as has been claimed, but in fact persists in woody and plant tissues in the long term.[1] This may explain why trees and plants like fireweed can be found in sprayed blocks up to 5 years later with deformed and stunted features.

Caught up in the chemical assault on aspen are a huge array of plants that are important for pollinators. Not only are aspen catkins sought out by bees in spring, but so too are the catkins of willow, which also gets eliminated by the spraying. Fireweed, blueberries, saskatoon, strawberries and all other flowering vegetation is virtually eliminated in the year following spraying, though some of these plants may grow back in subsequent years.

Even if some plants grow back, the real damage is in the forest type that now dominates these sprayed areas - in most cases pine monocultures. Once the pine trees achieve crown closure, they shut out light to the forest floor, and what remains is typically a small amount of grass and some moss.

If some aspen are left behind, it is a different story. Once an aspen stand achieves crown closure, there is still a considerable amount of light reaching the forest floor. This light allows for a diversity of plants and flowers that pollinators, and thus beekeepers, value. If you walk through an aspen forest - that is, if you can wade through the waist-deep thickets of understory plants - look around. Observe all the opportunities for the bees: rosebushes, hazel and saskatoon are very thick in an aspen forest. An aspen forest at any age of its development retains this all-important forest floor vegetation. A forest without aspen is a forest that is reduced in biodiversity, resilience, and usefulness to pollinators.

One study that Dr. Kathy Martin carried out near Williams Lake found that 95% of cavity nests for birds and mammals were in aspen trees, even though they constituted just 15% of the trees in the study area.[2] The importance of aspen extends to larger mammals as well. Research by Dr. Mark Hebbelwhite, in Idaho, shows that aspen stands are an important habitat type for mule deer because it is where some of the most nutritious plants can be found.[3] The trees themselves, not only young shoots but also the mature bark, are a favourite food for moose in winter time. A study by Dr. Roy Rea shows that they preferred aspen bark even above Red Osier Dogwood, long thought to be the moose's most desired twig.[4]

So it's not just bees that lose when we reshape our forests away from biodiverse woodlands towards coniferous monocultures, it's the moose, beavers, deer, birds and a whole array of life that forms the soul of our boreal and northern forests who lose. Glyphosate is a known toxin to frogs, insects and invertebrates as well.

Forest managers believe that they are maintaining ecological balance by spraying aspen, as they have a pie chart that shows a certain percentage of our forest is aspen and they need to keep it at that. This ignores the ecological reality of how forests work. After a disturbance, aspen, birch, and other deciduous species dominate. When you have a massive scale

A manual brushed area in 2013, at kilometre 24 on Blackwater Road, southwest of Prince George.
Photo James Steidle

of disturbance across our landscape such as we now have, it is nature's desire to have a higher percentage of broadleaves.

We should also desire this for our own benefit. Not only are the aspen and other broadleaf species good for the bees, they are good for wildfire resistance, as an aspen tree in leaf is less likely to burn, and they can reduce opportunities for pests like pine beetles. And in terms of economic value, their market share of the North American wood products sector has grown. You can now buy aspen plywood made in Ontario at all Home Depot stores in BC. These products could be made from BC aspen. So not only ourselves but our wildlife, bees, and understory plants would all benefit from letting the aspen grow.

For more information please visit stopthespraybc.com, or Stop the Spray BC on Facebook. ❀

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James Steidle runs a woodworking company (www.steidlewoodworking.com) and tries to use aspen in his work as much as possible. He has recently returned to the Prince George area from Vancouver, where he operated for 10 years, with a truck full of custom cedar beehives. He hopes fill them with bees again for next year.

Canadian Honey Council

Stan Reist,
Canadian Honey Council Rep

The Chinese Agriculture Minister will be visiting Canada in the month of September, with the tentative location of Ottawa. It will be a one day meeting, and he is bringing business representatives who are looking to make contacts with Canadian interests.

Rod Scarlett and Pierre Giovenazzo will be going to China on the 22nd of August, to meet with Chinese officials regarding beekeeping businesses booking booth space at Apimionda in Montreal. They are hoping to make contacts to buy Canadian honey and import it into China.

I have been working on the harmonization of interprovincial bee stock movement, inspections and transportation permits. From Manitoba to the west they are pretty well coordinated, but to the east that's another matter. Some of the reason for this is supplying replacement stock for eastern Canada. There is a lot of emphasis on queen rearing here, but not much on actual stock. For the most part we import a lot of stock from either Australia or New Zealand, and now from Chile.

There is and probably always will be disparaging remarks about imported stock. In the last few years I have noticed a remarkable improvement in the queen stock out of New Zealand; the colonies are building up much better. You can get early packages and raise them up, and by the 15th of May you can have a box of spring honey and split the hive and if you are on your game, you can also pull some nucs. This is cost effective for a $200 package, and you haven't gotten into the summer nectar flow.

The downside is the importation of unwanted guests. We already have firsthand knowledge of that, and the unending health challenges for the bees, which adds to the cost. I attended a meeting recently and there was a US presenter who is studying varroa. He traveled to Asia as part of his research and was surprised to find that varroa mites are not a problem there. The bad news is that they have Tropilaelaps, which is more destructive than varroa, and there are no treatments.

In his presentation he mentioned that Tropilaelaps is on the move. It is now in South Africa and has been found in Tasmania. I am not sure if this has been confirmed. He also stated that he thinks we have about 15 years before this mite reaches North America.

With this kind of thing in mind, the directors of the CHC are going to be conducting a survey on the capacity of stock production in Canada. I think we have a bigger capability than we realize, and it might not be hard to get production up to meet demand. I am surprised that BC is not producing more replacement stock for eastern Canada, considering our weather. We have a fair number of beekeepers but not that many hives (approx 48,000 - 50,000), and we overwinter quite a bit of stock from other provinces. It would be great to see what we are producing now, and if there is an appetite for expansion.

The jungle telegraph lately has a concoction of oxalic acid and glycerine making the rounds. Hocus pocus remedies that AREN'T REGESTERED FOR USE IN CANADA. We have a good number of registered treatments for varroa in Canada, and if they are used in the manner prescribed you should have no trouble controlling varroa. In my travels I have been exposed to various treatments and voodoo remedies. No idea of the LD50 to the bees or to humans, no MRL's for the honey. As Canadians we have for the most part been respectful of the chemicals we use to treat the hives and have enjoyed the research value put into them to keep the bees safe and us humans too. This is evident in the amount of time the treatments have been effective. In other countries, some of the treatments have only worked for a very limited time, two to three years and that's it.

So please people, RESIST the URGE to be the first kid on the block to try these new and illegal formulas and possibility destroy what we have, mites that are treatable. As one friend of mine keeps asking, "Who are we supposed to be saving the bees FROM?"

Bob Gook on the Move, a Beekeeper's Beekeeper

Long time beekeeper Bob Gook of Ashcroft, BC has sold his bees and is moving to California to start a new life. Bob is a masterful beekeeper and gentle soul, and was a regular presenter at the Lomond's annual spring field day in Savona. He has been a wonderful resource for the Kamloops Beekeepers' Club and he will be greatly missed.

The following is a note from Margaret Jones of Savona, BC, who was helped by Bob with a cranky bee problem.

I had more than a few guard bees in my main bee yard last spring, and I suspected that I had a cranky hive developing but had no idea which one yet. All of the hives had been edgy the previous time I'd checked them because a storm was developing.

A few days after observing this behaviour, I checked for swarm cells and to judge how many queens I needed to make up nucs for Joe Lomond. The hive closest to my house was so rank that I got pelted and stung through my suit. It was so bad that I closed up the hive and called it a day, knowing that they would follow me through the bee yard and upset the other hives too. I have had to deal with rank hives a few times in over 40 years of beekeeping! The next day I left that hive until last and, well, I lost my courage and left it alone until I could get queens from Joe.

Marg and Joe Lomond both offered to help me with the task, because next door to me are twin four year olds that do not need to experience being 'guarded'. The other hives were all genial and calm that day. I was not looking forward to our task of trying to find that queen to dispatch her. Joe and Marg called back later, after speaking to Bob Gook. He has a great method that turned out to be absolutely painless and super easy for me and my wheelbarrow to do alone.

The "Gook Method" of dealing with a cranky hive:

Prepare a new brood box with a queenright nuc, ready to be placed where the cranky hive sits.

Set up two new hive sites with bottom boards and lids ready to receive the two brood boxes from the cranky hive. Place them 50 feet from the parent hive and 50 feet from each other (I used two car tires for each temporary site).

In my situation, the cranky hive consisted of two brood boxes. Bob's method is to split the brood boxes of the cranky hive, put an inner cover on each to minimize the cranky bees' activity, and move one at a time to each new temporary site.

Then, put the prepared new brood box, with nuc inside and enough frames to fill it up, on the original cranky hive site. Put a queen excluder on, then the honey super(s) that were taken off, then the inner cover and lid. I added an empty honey super as well. This arrangement will accommodate the returning cranky field bees.

The next day, search the two new split brood boxes from the original cranky hive and kill the queen. In my case they were so calm that I could have looked while wearing a bikini without a worry about getting stung!

I made two nucs with bought queens from those two brood boxes that I moved. I had enough frames and brood etc. left over to fill a brood box, which I put above the re-queened brood box at the original site; I put the queen excluder on it and the honey supers, full of cranky bees, on top. When I checked that hive 10 days later, the contrast was remarkable. Both brood boxes were extremely calm and the honey supers were still full of very cranky bees. That contrast became noticeably less every week until there was a calm hive, with a very minuscule number of cranky bees.

It was about 4 weeks before I wasn't guarded when I stepped out my back door, and 6 or 7 weeks until they stopped guarding me when I went into my bee yard. All is calm when I walk through there now.

Thank you, Bob Gook, for your brilliant advice that helped me easily deal with my cranky hive!

On another note...

I have been raising queens from swarm cells in nuc boxes, in case I need a new queen on very short notice. I overwinter any nucs left in fall in regular deep boxes on top of strong hives, using a double screened inner cover between them. This method gives me ready nucs for replacing dead hives in the spring, and I do have fun doing it. ❀

Honeydew

by Richard Jones

Bees do not produce honey.

Have I got your attention? Bees produce royal jelly, venom and wax. Honey and propolis, or rather plant secretions of various types, are collected and processed by bees into the products we know and that beekeepers harvest.

In the very first edition of The Hive and the Honeybee, in 1853, Langstroth noted that bees not only gather honey from blossoms but often obtain it in large quantities from "what have been called honeydews - a term applied to those sweet clammy drops that glitter on the foliage of many trees in hot weather." He also recorded that honeydew came from two sources: that exuded by the plant itself, and that excreted by insects that fed on the plant. That terse definition of 165 years ago is still a very good basic summary what constitutes honeydew.

It is strange, therefore, that a low level of awareness of the product exists on the North American continent, particularly as Langstroth was from the US and is regarded by many as the father of modern beekeeping. In Europe, honeydew honey, in some countries called forest honey, is a much sought after product demanding top prices. Indeed, 65% of the honey originating in Greece, a leading European producer, is actually honeydew honey. It is now thought that most honeys will contain a honeydew element of recognizable proportions, but honey marketed particularly as Forest Honey will have well over 75% from this source.

Honeydew, like nectar, is made from plant fluids. It does not involve the flowers but can, nevertheless, be legally called honey. It comes from the phloem sap that moves, under very high pressure, within the plant's tubular transport system supplying it with the necessary nutrients. Bees do not have sufficiently strong mandibles to puncture the "skin" of the plant or the tubules (eg. the veins on leaves) but certain plant sucking insects do. These Hemiptera include scale insects (coccids) and aphids.

An aphid with strong mandibles gets sap from a stem. The residue of an excessive intake will be excreted as honeydew.

Photo Franc Sivic, Silva Apis, Slovenia

Having tapped into the "vein", due to the pressure therein, they quickly fill with sap which passes through them undergoing certain chemical changes on the way. The small amount of protein present is digested, and the water, sugars, tannins and other indigestible materials are excreted with some force to form a droplet on the leaf. The forced ejection is necessary to keep the sticky liquid away from the insects themselves and so avoids gumming up their activities. Other insects, especially bees, wasps and ants, collect these droplets. Ants are particularly important as they offer the aphids some protection. It was once thought that the ants "farm" them rather like a dairyman might keep a herd of cows, but new evidence shows that the relationship is a little more complex. In addition to physically removing the wings of the aphids and producing a chemical which inhibits aphid wing growth, the ants' chemical footprint slows aphid dispersal. It has been repeatedly shown that honeydew flows are greatly increased by the presence of ants.

The most important sources of honeydew are trees, and of these conifers, which give no nectar. Silver fir, cedar, larch, spruce and Scots pine give the highest yields. Of the deciduous trees, oak is an important source, along with poplar and beech. The lime tree is a source of nectar, but also of honeydew, as anyone who has parked a car beneath such a tree during the flow will verify! Honeydew from conifers varies in colour from light to dark amber often with a greenish tinge. It is heavy bodied, strong flavoured and slow to granulate.

Honeydew in pristine natural conditions is fine but its tacky nature means that if bees collect it from industrial areas or areas with dust pollution, then these materials

Aphid excreting a drop of honeydew.

Exudate on a lime tree (*Tilia cordata*) being collected by a bee as honeydew.

Photo Franc Sivic, Silva Apis, Slovenia

stick to the broader leaves and pollute the forage. These pollutants are then stored in the hive reducing the quality of the honey.

Another danger which is associated with the collection of honeydew is exposure to pesticides. Scale insects and aphids can be a big problem for farmers, orchardists and also municipalities, who may apply insecticides to control infestations; if bees are harvesting honeydew at these times then they too will be exposed.

An additional problem with honeydew is that the bees will not be collecting any pollen with it as they do when collecting flower nectar, which can result in a protein deficiency. This can occur in the fall when there are fewer floral sources and the bees have nothing else to forage on, and at times of high heat and dry weather, when floral nectar isn't as available. If floral nectar is readily available, then the honeydew content of your honey will remain low.

One of the most valuable sources of honeydew production in Greek honey but is also prevalent in Turkey, is *Marchalina hellenica*, a scale insect which lives on the Aleppo pine. The flow is not as easy to predict as that of nectar from blossoms but it is so important that, for example, in southwestern Turkey around Muğla, up to 500,000 hives are especially moved in for the harvest in late summer. In these parts of the Aegean and eastern Mediterranean, *Marchalina hellenica* is deliberately introduced by beekeepers who operate a "grafting" system, by taking small branches on which eggs have been laid and tying them to other trees so as to increase the spread of the insect.

Some of my favourite honeys are honeydew honeys. I enjoy the Turkish honey from the Aleppo pine, it is quite a dark honey and very thixotropic - a honey with a lot of body that flows seductively and slowly from the spoon. It has a sweet, almost caramel quality. Very close to this is the honey popular in Germany's Black Forest region, the true Wald Honig (Forest Honey). This comes from the sap on the needles and around the buds of fir trees - again dark, thick and with a particular sweetness that is subtly different from floral honeys.

Recently, in a shop that specializes in many different honeys close to my home in Cardiff, I found that British mixed flora honey was selling at about £12 a kilo, while Greek Thyme honey and Black Forest honey was available at between £17 and £19 a kilo. I would add that the shop in question specialises in exotic foods at very reasonable prices compared with the general run of things - you could perhaps add another 25% elsewhere. I realise there are shipping costs involved but even if bought in the country of origin, honeydew honeys always fetch a higher price than mixed floral honeys.

In comparison with floral honey, overall honeydew honey is marginally sweeter, has slightly less water content, and is less acidic, with an average pH of 4.45 compared with an average of 3.91. The total mineral content, and the amounts of potassium, phosphorus and iron are higher in honeydew honeys than in nectar honeys. It can also have a high ash content, which can cause dysentery in bees. The main sugars in honey derived from either nectar or honeydew are almost always glucose and fructose, and some sucrose is usually also present. Honeydew honey characteristically contains appreciable amounts of trisaccharide sugars (such as melezitose, raffinose, fructomaltose), some higher saccharides, and also dextrin, and certain enzymes and amino acids not normally found in honey from nectar. Honeydew honey may also have stronger antibacterial properties than floral honey.

Crystallized honeydew, sometimes referred to as manna, on the leaf of a Wig tree (*Cotinus coggigaria*) which flourishes on the karst (limestone) areas of Slovenia and Croatia.

Photo Franc Sivic: Silva Apis, Slovenia

Other constituents present in very small amounts are used as 'honeydew indicators' in the microscopic examination of honey, as pollen grains are indicators of the plant origin of honey from nectar. Of these indicators, algae and sooty molds are particularly important. Honey bees collect honeydew from the green parts of plants and at the same time, with honeydew, they may collect other attached structures, such as the hyphae or fungal spores of plant pathogens and microalgae. The presence of algae may impart a greenish tinge to some honeydew honeys.

Bees store honeydew honey but it is not a good hydrocarbon source of winter food. The more complicated sugars it contains means the bee has to create a variety of specialist enzymes to digest the sugars, which in turn drain its protein resources and so weaken the bee. The effort involved exceeds the nutrition created. Its higher mineral and ash content also make it less digestible than floral honey and therefore it cannot be used as an energy source or for growth and development. To mitigate this, beekeepers will often remove honeydew honey from their hives before winter and feed sugar syrup. A new book – *Honeybee Nutrition in the Temperate Regions of the Northern Hemisphere* – by Dr. Zbigniew Lipinski, due to be published in September, gives the answer to this question in some detail. It also contains a great deal more vital, and until now unpublished, material on getting the food balance right for bees.

If you did not know what honeydew was your bees are certainly in the know. Most of your crop will contain some honeydew and in certain areas it could be as much as 80% or 90% of your harvest. Don't worry, turn it to your advantage and sell it as a premium product. Look how Manuka, albeit a floral honey, took off!

Ant extracting honeydew from an aphid

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About the author: Richard Jones is a Geographer by degree, and was a head teacher before moving into international public relations and fundraising. This experience then brought him to the International Bee Research Association (IBRA) in 1996, the organization founded by Dr Eva Crane in 1949. As Director for almost 16 years he had the opportunity to travel widely in order to learn about, and promote bees and beekeeping worldwide. In 2002 Dr. Crane asked him to become chairman of the Eva Crane Trust: www.evacranetrust.org.

Overwintering Honey Bees in the BC Central Interior

Tips from Veteran Beekeepers Walter & Susan Steidle - with an Introduction by Diane Dunaway

Susan and Walter Steidle of Punchaw, BC

Perseverance and adaptation is key to long-term success in beekeeping. This includes being responsive to localized conditions. It's recommended for those new to beekeeping, or new to an area that they seek out nearby mentors who consistently overwinter their bees with few losses. Beekeepers in the Central Interior of BC need look no further than Walter and Susan Steidle.

The Steidle's are into their fifth decade of keeping bees at their beautiful and remote off-grid ranch in the Punchaw area, 70 km southwest of Prince George down the Blackwater Road. The elevation is 2300 feet where the snow seems to come earlier than Prince George and stays longer. They wrap around 85 to 100 hives each fall.

Punchaw is a remote ranching and logging district south west of Prince George, on the Blackwater Road.

Wally and Susan arrived in BC in 1972, from Chicago. They started beekeeping about a year after their arrival, but Wally's love of honey began long before: "When I was a little kid my grandmother, when we went to visit her, she always made me a honey sandwich for the trip home. It's just a comfort taste." A neighbour in Punchaw gave the Steidles her old beekeeping hives and equipment when she learned about his weakness for honey. The Steidles then took a three-day weekend course on beekeeping at the College of New Caledonia, which hooked them on beekeeping for life.

Wally retired from a local sawmill in 2000, it's then that wife Susan and he increased the size of their apiaries. This addition was made on top of maintaining a cow-calf herd and putting up their own hay each summer. They're busy folks!

Mainly they wintered their hives outdoors but in 2007 they decided to try wintering indoors. Initially they were optimistic. Wally reported to BeesCene in 2007, "Here are a few pictures from my first year of indoor wintering. With advice from veteran Prince George beekeeper Ivan McGill, I used my insulated well house that holds two 750-gallon water tanks. The water and bees help to keep a fairly uniform temperature. One night reached -37C and the bee house was a balmy -1C. I have an oil heater in the building but haven't had to use it yet. It's usually about +3 to +5C. I do have an exhaust fan and every couple of NIGHTS I open the door and run the fan for a few hours. A few dirty hives but they are still alive."

Susan tells us why this two-year effort was abandoned, "The building we used for wintering indoors is a garage/well house and being off-the-grid, our ventilation system could not be used often enough to control the moisture so we went back to outdoor wintering."

The Steidle's indoor wintering experiment from 2007, 2008. Due to ventilation challenges that resulted in an excess of dysentery they went back to outdoor wintering.

Since 2009 the Steidles have honed their outdoor wintering technique. The Steidles take it from here:

Today, in northern beekeeping, there are many reasons a colony does not survive the winter. Disease, infestations, queen trouble, starvation, freezing and moisture to name a few. Bees form a winter cluster that expands and contracts with the outside temperature as it rises and falls. The by-product of this cluster is metabolic water vapour that must be allowed to escape. Ventilation during winter is just as important as it is in the summer months. We don't mean to imply that moisture is the deciding factor in the survival of our hives, we just find that good ventilation results in cleaner, healthier hives in the spring. As for our average survival rate, that is a hard one. Can't really come up with a percentage, but with a fluctuating number of hives we do pretty good.

We start wrapping the hives in October when the weather is changing but can still wrap without gloves. We remove the wraps in the spring, March or April when the weather seems to we warming up. In January there can be a short period when the weather is warm enough for us to remove the bottom entrance reducer and use a little homemade scraper to clean out the bottom board of dead bees.

We do keep on a feed jar all winter, and have never had one break. I use a 1.9 L wide mouth Mason Jar (just fits in a deep), and provide supplemental 2:1 sugar syrup.

Wally showing BCHPA President Kerry Clark his hive wraps at their farm in Punchaw. *Photo Diane Dunaway*

Here's a step-by-step of how we prepare our hives:

SUPPLIES

1. Alley Wrap. This is used to wrap ductwork, it's a 1" deep fibreglass glued to a quilted foil paper available for purchase at Home Hardware. It comes in a 4' wide roll and I have them cut it to a 7' length. This will cover two hives by cutting the 4' width in half so you have two pieces of 2'x7' alley wrap.

Alley wrap cut outs and vented inner cover.

2. Shrink-wrap. We use our leftover green silage film wrap that is 30" wide. This is the same as shrink-wrap. It protects the alley wrap from the elements so we can reuse it.

3. Tuck tape.

4. A tapered wedge made of wood, used to stick into the top entrance. The reason for the tapered wedge is to allow for different top entrance sizes, so as to keep it tight while wrapping. We also use a steel block (3/4" square and 4" long) to cover the bottom entrance in the entrance reducer. The weight of the steel block is helpful to keep the reducer tight to the hive. Anything would work but heavy is better.

5. Inner covers with the centre feed hole that's 2 1/2" in diameter. Plus we've begun to add 1 1/2" screened corner holes. At least two per inner cover, some have four. Ventilation, ventilation, ventilation. (Does that sound like "Mike Holmes"?)!

6. Wood shavings - we check them through the winter for moisture and if wet we replace them.

7. Feed jars (note that small nail holes should be filed with any remaining rough edges facing down so that bees don't injure their proboscises (tongues) when retracting them).

WRAPPING TECHNIQUE

Our hives consist of two brood supers; inner cover; empty super; and outer cover. You will need to measure where to cut the top entrance hole before putting alley wrap in place. Also cut a notch at the bottom where the entrance reducer goes.

1. Block entrances. Disturbed bees are not happy bees.

2. Line up alley wrap to entrances, wrap around hive and use small piece of tuck tape on overlay in back to secure.

3. Place shrink-wrap against alley wrap, fasten with small piece of tape and stretch around alley wrap making sure you keep the wrap above the entrance reducer. Overlap stretch wrap and tape the whole seam plus a little onto empty super.

4. Using a knife, cut a slit in stretch wrap for inner cover entrance. Hopefully you remembered not to cover bottom entrance reducer.

5. Place feed jar on inner cover and fill the remaining space with shavings and cover with outer cover.

6. Before removing the top entrance block, staple little squares of 1/4" wood above and below top entrance, on the outside of the wrap, to keep bees from going behind alley wrap/shrink wrap.

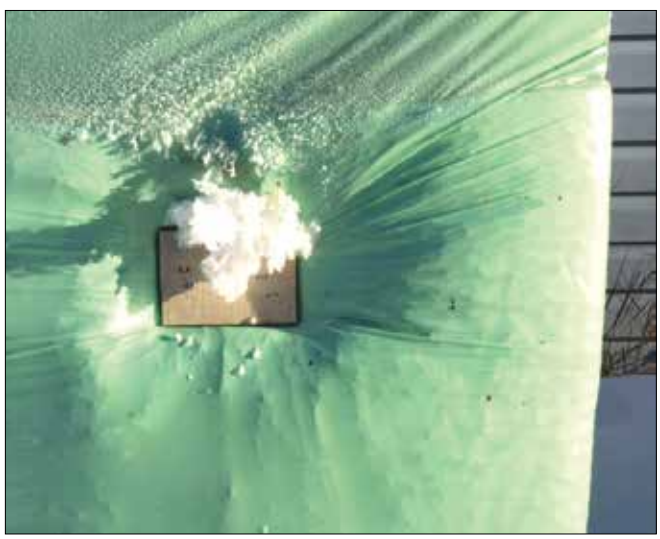
7. Now the fun part, remove blocks from both entrances (run).

Ready for winter!

HIves are wrapped for winter.

The black covering is coroplast and shavings. The tire doesn't mean anything; must have run out of bricks or rocks. But sometimes when I know a queen is due for a mating flight I'll throw on a tire (13" is best, ha ha) so she knows for sure which hive she came from (who knows, eh).

Note: You can winterize single hives using these methods. Alternate method is to use Coroplast (white corrugated plastic sheet 48" x 96" x 157") or old paneling, whatever you think would work. We make it oversize by 2" per side to hold shavings as insulation. Make sure you use something over the entrance to block shavings from falling through. Tie the corners for easy fold up and storage. ❀



Frosty hive entrance: -19°C high, -31°C low on January 10, 2017. An important indicator that the bees are alive. No frost, no bees!

Interview with a Honey Bee Research Scientist

Recently, we got in touch with Megan Colwell, a PhD candidate at the University of Manitoba who is studying honey bee virus transmission via beeswax. Megan presented some of her work at our AGM last fall.

Tell us a bit about your background, and how you started studying honey bees.

I'm from Dartmouth, Nova Scotia, and went to Acadia University (in NS) for a BScH and then an MSc in Biology. I sort of stumbled into honey bee work - I decided I wanted to do a research project in my third year of undergrad (2008) and the professor I wanted to work with had two options for me: honey bees or tree swallows. I chose honey bees and haven't looked back!

My first research project looked at *Nosema* infections and behaviour. I then worked as a research assistant on a cage study on *Nosema* species co-infections and a project with Newfoundland and Labrador. My MSc research compared nutritional content and pesticides in honey bee-collected pollen in three fruit crops, and after pollination season. I spent a summer driving back and forth in Nova Scotia, New Brunswick, and Prince Edward Island collecting pollen from colonies in apples, blueberries, and cranberries.

Where are you working now?

I'm now in Winnipeg studying at the University of Manitoba as a PhD Candidate. I'm co-supervised by Dr. Rob Currie who is the Department Head of Entomology, and Dr. Steve Pernal who is a Research Scientist and Officer-in-Charge of the Beaverlodge Research Farm in Alberta. It's great to be here, and I'm still struck by the difference in beekeeping - between a focus on honey production in central/western Canada and pollination services in eastern Canada. The University of Manitoba has the last stand alone Department of Entomology in Canada and has been a centre for quality honey bee research for decades.

I was keen on continuing to work on honey bee health and knew I wanted to study with Rob. He has a great reputation as a researcher, teacher and advisor. I took a leap in moving to the Prairies without knowing anyone between Toronto and Calgary, and working with Rob is a big part of it being worth it. My current work is an extension of a project our lab did several years ago (Honey Bee *Apis mellifera* Parasites in the Absence of *Nosema ceranae* Fungi and *Varroa destructor* Mites: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0098599). They examined the effect of different comb sources on viruses in different life stages of bees and factors like honey production. I was a minor player in it when transitioning from my BScH to MSc. Bees were kept in boxes that were honey supers the previous year, dead colonies lost in winter, or frames of new foundation. Half the boxes were treated with gamma irradiation or left untreated.

There were interesting relationships between viruses and treatments, suggesting that wax has an influence on colony-level virus infections. Brood reared on wax with higher virus levels on it had higher virus levels than brood from the same source reared on wax with lower virus levels on it. The brood was all from the same low virus source, laid by New Zealand queens and reared by New Zealand workers. This suggests that waxborne viruses are having a direct effect on brood reared in contact with them, although we haven't found enough evidence yet to say for certain that waxborne viruses are infecting bees.

I came in to the lab in 2014 with the aim of taking a closer look at this relationship. The first thing I did was develop a method to test wax itself to determine presence and to quantify what I call "waxborne" viruses. This has allowed me to perform experiments without relying only on virus levels in the bees themselves, but also directly on wax. It's quite interesting that waxborne viruses affect bees - most honey bee viruses are made of RNA, which is conventionally thought of as unstable. RNA is similar to DNA in components, but DNA has a double-helix structure and RNA is usually single stranded. This, as well as some chemical differences, means that RNA viruses are at greater risk of degrading or breaking down, especially when outside a host.

I suppose it isn't as surprising that wax can act as a "tissue" and infect more bees, but it is surprising that we can detect viruses on wax even after weeks or months without contact with live bees. It isn't a new concept, but it's adding onto what we already know about virus transmission in honey bees - most of which is direct from bee to bee or mite to bee. There are some other groups working in similar areas (for example, researchers at the Baton Rouge USDA lab), but to my knowledge I'm the only one looking at viruses directly on wax.

Can you talk briefly about some of the things you've been seeing?

I can't go into detail about results as I haven't published them yet, but can give a couple highlights:

1. I've detected viruses on wax from natural exposure (from winter dead out colonies) and experimental exposure (a cage experiment with adult workers). There is also evidence that bees introduce viruses proportional to their own virus levels – which makes sense, sicker bees make dirtier comb.

2. Something that surprised me was seeing that honey bee viruses become airborne. In a cage experiment I saw viruses on wax in cages that did not contain bees – at levels higher than background levels. This means viruses from adult workers within the incubator spread and landed on wax in neighbouring cages. I haven't yet seen that airborne viruses increase infections in adult workers, but that doesn't rule out that there can be an effect.

3. I saw some interesting results from an experiment last summer and am currently doing a scaled up version with 60 nucleus colonies to compare wax treatments (storage time and electron beam irradiation). We already know from work done at the USDA lab in Baton Rouge that gamma irradiation can reduce viruses in bees reared on wax compared to non-irradiated wax. My project is in the same vein. I'm going to compare how effective storage may be in comparison to irradiation, which is more labor intensive and costly. I'm also testing with two sources of wax, either wax from high virus or low virus colonies, and I'm pairing the method of direct detection of virus levels on wax with the indirect method of testing bees reared from that wax. I think this should get to the heart of the question, do these waxborne viruses have a direct effect on honey bee health? And, what can we do with used wax to limit this effect? ❀

Some of the colonies in Megan's research project this summer. *Photo Megan Colwell*

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Please contact the Editor with any changes.

Richmond Beekeepers' Fall 2017 Workshop with Kirk Webster

A few hours last November with a gentle, inspiring man.

by roselyne lambert

I have been beekeeping for 5 years now, 4 years without chemical treatments. When I first decided to manage my bees without chemicals, there were few visible models of doing this successfully. One of the beekeepers I turned to for guidance online and in magazines was Kirk Webster. When I heard that the Richmond Beekeepers' Association would be hosting a day with Kirk, I was undeterred by the 800 km drive, and signed up right away. Writing about this experience is also an opportunity to express appreciation to the Richmond Beekeepers' Association for hosting Kirk Webster at a two day workshop in the city last fall, to hear him speak about his lifelong experience as a beekeeper and, since 2004, as a chemical treatment-free beekeeper.

Kirk maintains 300 colonies for honey production and 400 baby nucs for breeding queens in New Haven, Vermont. Most years, he provides an additional 400-500 treatment-free overwintered nucs for sale. Kirk's bees and queens are sought after for their ability to survive Varroa mites and challenging weather conditions. He presented to a mixed audience in Richmond that included some interested commercial beekeepers, some scientists, and of course many hobbyists like me.

He opened the session by honouring and crediting those who have inspired and mentored him. These include organic farmers Bill and Martha Treichler of the Mountain School, a private school based on an organic farm. In a recent write-up on his website, Kirk elaborates on how he spent "the last two years of my high school sentence" at the Mountain School. Bill and Martha were his "first encounter with mentors, also the best and most lasting." Learning and working at the Mountain School was foundational and life changing as Kirk did not grow up in a farming family. Bill and Martha were among the first members of the US organic farming community; they were inspired by Sir Albert Howard, the "father of modern farming" who taught that "pests should never be considered enemies of their hosts, but allies."

Further inspirations cited by Webster included Japanese farmer Masanobu Fukuoka, the philosopher and author of *The One Straw Revolution* who was known for natural farming and re-vegetation of desertified lands, as well as Vermont commercial beekeeper A.E. Manum. In the first half of the 1880s, Manum was nationally known as one of the first large scale beekeepers, and possibly the first to use outyards.

Kirk also credits Brother Adam for much of what he does in beekeeping. He states that most of his methods, from queen rearing to overwintering nucleus colonies and bee breeding, are lifted from the work of Brother Adam with some adaptation: "From the scope of his breeding work, to the meticulous attention to every detail as he solved a whole series of practical problems, he created a standard for beekeeping that has never been equaled."

Varroa mites co-evolved with Asian honey bees, but when they first parasitized European honey bees, it was a disaster - many colonies died because they hadn't had the opportunity to develop the mechanisms to coexist. Kirk describes the first years of beekeeping with varroa as catastrophic, and like everyone else he treated his colonies (with Apistan). Eventually, influenced by his organic farming background where all is done without pesticides or synthetic fertilizers, he decided to stop using pesticides. He applied his last treatments in 2004. Kirk says that, "This is a good news story. I am completely convinced now that mites and bees can co-exist."

Kirk Webster at the Richmond Workshop, November 2017 *Photo roselyne lambert*

In Vermont, tracheal mites came first and varroa followed. Before tracheal mites, 5% winter loss seemed like a disaster. At that time, Kirk was just starting to overwinter nucs. Prior to that, most beekeepers in the country would overwinter colonies in three deep boxes. He discovered, quite by accident, that he could overwinter four frame nucs. At that point no one

Overwintering 4-way nucs on top of double story colonies. *Photo Kirk Webster*

believed that a small cluster could live through the winter. Kirk, and everyone else, used to combine nucs to standard colony size before wintering. He describes how, one late November, "I founds four nucs I had not recombined. I plopped them on top of a full colony and assumed they would not survive." Every single one of them did. He kept experimenting with overwintering nucs in the face of much skepticism.

Roger Morris of Cornell University, who taught the first known Master Beekeeping course and also taught many of today's bee scientists, "told me flat out that they would not survive." In fact it worked so well that it allowed Kirk to become a full-time beekeeper around 1992. At that time, northern beekeepers imported southern queens every spring, but the southern queens stopped working out because of tracheal mites. Successfully overwintering nucs was a turning point for him. He did find out later that others had experimented with this in the past, but it was not documented, and he was the first to write and speak about it. Mike Palmer, who continues to be instrumental in popularizing nuc overwintering, learned it from Kirk and "added his own variations."

It turned out that his nucs survived better than the full colonies. "Even when I lost 30 to 40% of my stock in the winter, I could replace my losses with the nucs." He found that without any chemical treatments, the natural balance came back and after 4 or 5 years he was back to a full size apiary.

Kirk now overwinters his full size colonies in 2 deeps rather than 3. At some point, he noticed that the largest colonies seemed to suffer the most from varroa. To control the genetics of his stock, he added an isolated mating yard for queen breeding.

Kirk attributes much of his treatment free success to his early access to Russian queens: "Once I had Russian stock, I was able to eliminate treatment." Russian bees are known for being late to get broody. They contain the size of the brood nest in the spring and fall, which may assist in controlling mites. His last treatment on honey producing colonies was in 2002.

His operation consists of honey production, nuc sales, and raising queen cells. In the last few years he has added baby nucs, because it is easier to find and catch queens in them. These baby nucs can provide a reservoir of queens for the spring, and he highly recommends the system for large operations. Kirk stopped treating his baby nucs in 1998. It is also worth mentioning that he makes all of his own wax foundation, with his own wax, in a couple weeks in the winter (3000 sheets).

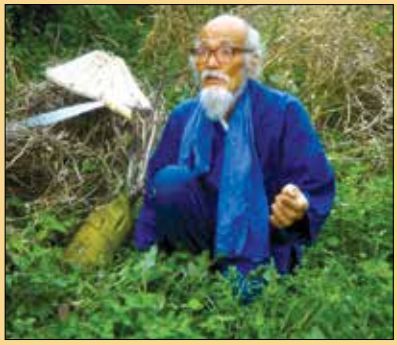
Kirk reports that after his first five years without chemical treatments, he felt that he had much better bees than before: "As Sir Albert said, the tracheal mites had selected for resilient bees way better than I would have. We must use our pests and diseases as helpers and friends and learn from the bees. Varroa is our ally. The mites have taught me that the colonies that survive, overwinter with a small cluster." Kirk believes that bees can adapt to most things, but not to the poisoning of the environment. He is "frankly in shock" that there aren't more commercial operations going treatment-free. He reports that he has not had any case of American foulbrood for many years.

Kirk listed the following as key elements of his approach to beekeeping:
· I am depending on the abilities of the bees, but I don't know how they are doing it: "The element of wildness"
· The importance of farmers - the ones who put it all together
· Horizontal breeding methods rather than vertical
· The element of mind: beginner's mind and long experience working together (Sir Albert Howard and Masanobu Fukuoka)

Four practical things that Kirk did:
·Learned how to raise queen cells
·Learned that the best way to use them is to overwinter them and use them in the spring/summer
·Incorporated the Russian bee
·Started using an isolated mating apiary

He stresses that management and breeding work together. He says: "I still lose more colonies than I did before varroa, but I have a balance." He finds chemical

Sir Albert Howard
(1873-1947) was an English botanist and leading figure in the early organic farming movement. He worked in India as an agricultural adviser, and came to support traditional Indian farming practices over conventional agricultural science; he found that he learned more from the farmers in India than he did while studying agriculture at school. He emphasizes the importance of maintaining humus, keeping water in the soil, and the importance of mycorrhiza. He also advocated studying the forest in order to farm like the forest, and understanding the interface between ecology and agriculture.



Masanobu Fukuoka
(1913-2008) developed the idea of 'natural farming', which sought to mimic the complexity of living organisms that shape an ecosystem. He also advanced the use of clay seed balls, an ancient practice in which seeds for the next season's crops are mixed together, sometimes with humus or compost for microbial inoculants, and then are rolled in clay to form small balls. This method is now commonly used in guerilla gardening to rapidly seed restricted or private areas.

treatment-free beekeeping "more fun, more interesting, and more profitable."

Kirk introduced the workshop participants to a number of successful treatment-free beekeepers, including Chris Baldwin, a commercial beekeeper using Russian bees, who manages around 2000 hives. I appreciate that Kirk expresses respect for his teachers but also for his students. He says, "you cannot succeed by just copying me. You can inspire yourself from my system, but you have to come up with your own improvements."

Kirk talked about what he called "the evolution of Darwinian beekeeping." He says Darwinian beekeeping is a term coined by Tom Seeley. Some key ideas of Darwinian beekeeping are that a bee should be adapted to where it lives (local stock) and that we should consider tough winters an asset because they cull weak stock. Kirk told us that Tom Seeley is his favourite researcher because he sees him as independent from all the pressures of agricultural schools. He referred to a lot of Dr. Seeley's research in his presentation, noting that he has spent his life studying honey bees living in the wild.

Dr. Seeley found that bees living in the wild almost always choose a cavity that is roughly the size of one Langtroth box (about 40 liters) and because of this, they will swarm every year. When varroa came it nearly wiped out the entire feral colony of the Arnot forest (an area in New York State where Dr. Seeley has extensively studied honey bees). A few years later, they had re-colonized the area, and he found that they were coexisting with varroa. Seeley has also found that in this situation, honey bees prefer an entrance at the top rather than at the bottom, and will chose an opening between 12 - 75 cm^2. Seeley raises bees himself; he uses one regular super for colonies and adds one shallow super for the honey flow. Kirk uses that principle but modifies it, by also overwintering in nucs.

Beautiful brood from a four year old queen - five years after the last treatment. *Photo Kirk Webster*

Some of Seeley's other observations have shown that wild colonies have more insulation because of tree thickness. Seeley also found that feral colonies will contain 15 - 20% drones. He suspects that the drones may have more than a reproductive value in a colony. There is also some evidence that a colony does not choose at random whom to raise as a queen, and that therefore it is better for bees to raise their own queens. Kirk says, "I stopped putting my judgments on the bees and decided to trust their wisdom."

When tracheal mites came to England, they killed nearly 80% of the bees. Brother Adam traveled extensively, bringing bees back from everywhere he went, and from them bred the Buckfast bee. In terms of adaptation, Kirk said: "We almost have to admit that we have very few bees that are adapted to our conditions."

In his own operation, to control genetics to the best of his ability, Webster uses an isolated breeding yard in the mountains that he floods with his own drones. Producing honey provides half of Kirk's income. Kirk does not feed pollen patties to his bees, and he much prefers to feed them honey than sugar water. He pointed out that if necessary, it is easy to feed them a frame of honey laid on top of the box. He also stressed the importance of forage diversity for good nutrition. In terms of hive density, Kirk says that because of bears, he cannot comply with Seeley's recommended density of no more than one colony per km^2 (which is what feral bees do), although he would like to.

Strong "baby" colonies wintered successfully on one pallet - spring 2006. *Photo Kirk Webster*

In a private conversation this spring, when asked if he feels discouraged by his heavier losses of the last couple winters, Kirk stated that he was "disappointed, but not discouraged." He says the entire industry has struggled with larger losses. 2016 was one of his best years, and the last two winters have been the worst ever, so Kirk speculates there are new factors involved - possibly more virulent viruses or the accumulated effect of the build-up of pesticides in the environment. Kirk adds that, "the big picture is that my mentors have taught me that I could have a good life, without stuff." The capacity to be frugal allows him to have bad years but still get by.

Nature oriented commercial beekeeping is what Kirk calls what he does. He states that beekeepers, in using certain treatments on their bees, lose ground in the push for reduced pesticide use in the environment: "by becoming heavy users of insecticides, we have lost our credibility as advocates." ❀

An off-grid homesteader and organic gardener who is passionate about traveling the world, roselyne lambert has been bee-witched since 2014. Her two colonies have grown into twenty, and are thriving at her home in the woods east of Prince George. A counselor for many years, she spent much of her life fascinated by the mysteries of the human mind. She is now using her observation and research skills to become a better beekeeper.

Wasps and Honey Bees

by Kerry Clark

As mentioned in my regional report, the BC Peace region this year has a remarkably high population of wasps: yellowjackets and baldfaced hornets (larger, black and white). If you're interested in what species you may have in your area, search for "vespidae atlas" and have a look. For a nice discussion of the topic, see: https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em9211.pdf

A nest control method I don't see mentioned but is one that I prefer, is the use of a vacuum that holds water (Shop-vac). I recognize that wasps are generally beneficial. They eat a lot of insects like aphids and mosquitoes that otherwise we could have problems with. It's just that sometimes the wasp population gets excessive to a beekeeper's tolerance.

Weak bee colonies like mating nucs can be destroyed by wasps. For the rare occasion that it is appropriate to de-populate a wasp nest, the Shop-Vac method consists of the following: a half litre of water with a few drops of dish detergent in the vacuum, then simply (you might cover up for this step) put the tube next to the entrance of the nest, before or after turning on the vac. The wasps can't (usually) escape the suction. After 20 or so have been sucked in, you can tap the nest and more will come out and be collected and euthanized in the soapy water. An appropriate proportion (depending on your tolerance) of the adults can be removed and discarded, to keep the nest from being bothersome to people. Repeat later if necessary. No poison. No fire. The nest survives (in some form) to continue the beneficial work they do. Toward...balance.

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Mike Palmer – Mike specializes in the Sustainable Apiary using production colonies, nucleus colonies and mating nucs. That strategy gives him enough bees to produce Vermont's prime comb honey and sell queens and nucs to others in the area. He isn't one of the largest but he is one of the best. Learn the how's of this northern, non-migratory beekeepers success story.

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John Miller - John owns Miller Honey Farms which is based in Blackfoot ID but also has locations in Gackle, ND and Newcastle, CA. Like many commercial beekeepers, John trucks his bees to several states for pollination but what John does differently from most is he winters his bees in advanced wintering buildings in North Dakota; something which is virtually unheard of in the commercial beekeeping industry. Come listen to how he makes it all come together into a successful operation.

Ray Olivarez – Carefully chosen locations in Northern California, Montana and Hawaii's Big Island allow Olivarez Honey Bees to offer customers premium-quality queens and bees year-round. OHB is surely one of the largest package and queen providers in the US with specialty climate controlled trailers that allow them to truck packages across the country. In addition to selling queens and packages, Ray's team also provides almond pollination and produces honey. To top it all off they offer a retail store to die for and host a large "Hobby Day" every spring. Sure to be a fascinating 4 hours hearing just how they do it the OHB way.

The Art of the Label

In this issue we are starting a new column, looking at honey labels around the province. This issue's label comes from Leonard Foster's lab.

Thanks to Bradford Vinson and Nat Brown for sharing information about how they came up with their label design.

Nat Brown

The UBC Foster lab honey label was created by the lab's microbiologist Nat Brown, PhD, who has a background in graphic design.

As a lab with a focus on exploring the mysteries of the honey bee, we end up with an amount of honey from time to time which of course needs to be bottled.

We do not sell our honey because of the ethics in an academic environment.

We give or donate these jars of Nature's Nectar to various people or institutions and our label reminds people where the sweet treat came from.

Nat says, "I definitely aimed to evoke a certain feeling of the organic aspects of the earth, and traditional harvest, through the label.

That, and to have a broadly appealing connection to the academic culture that was the real source of the honey.

The concept revealed itself when I found the great, detailed museum sketches of the bee forms presented on the label." ❀

British Columbia Bee Breeders Association

Armstrong Apiaries
James Macdonald
Armstrong
250-308-8219
jamesmacdonald@telus.net
Q N

Ashcroft Honey
Joe & Marguerite Lomond
Savona
250-373-2540 250-457-7193
marglomond@gmail.com
Q N, bee supplies

BBBees
Barry Beadman
Oliver
250-498-3153
barryanddiane@telus.net
Q N

Bear Creek Honey
Mart & Rita van Herk
Chilliwack
604-845-1807
vanherk@telus.net
N

Black Horse Apiary
Wendi Gilson
Saltspring Island
wendigilson@yahoo.ca
250-882-2852
Q N

Brad Cook
Victoria
250-818-8763
b.cook@pureagriculture.ca
Q N P

Brenda's Bees
Brenda Jager
Gabriola Island
250-755-5834
bzbees@telus.net
Q N P

Campbell's Gold
Mike and Judy Campbell
Abbotsford
jwcampbell@campbellsgold.com
604-856-2125
Q N

Flying Dutchman
Stan and Cheryl Reist
Nanaimo
flydutch@telus.net
250-390-2313
Q N P

Green Bee Honey
Michalina Hunter
& Darwyn Moffatt-Mallett
Garibalidi Highlands
250-616-3070
greenbeehoney.bc@gmail.com
Q N C

Heather Higo
Langley
heather.higo@gmail.com
604-532-6904
Q N

Heather Meadows Honey Farm
Ian Bissonnette
Telkwa
250-877-3495
hometownhifi@yahoo.com
C

Honey Bee Zen Apiaries
Jeff Lee
Creston
250-866-6861
info@honeybeezen.com
Q N

Howe Sound Honey and Bees
Ian Kennard
Bowen Island
604-947-9518
icken@shaw.ca
Q N

Jinglepot Apiaries
Sol Nowitz
Nanaimo
250-753-9619
jinglepotapiaries@telus.net
Q N P

Kettle Valley Queens
Elizabeth and Terry Huxter
Grand Forks
lizandterry@gmail.com
250-442-5204
Q N

Mark McPhail
Kelowna
250-764-2877
cmmcphail2@gmail.com
Q N C

Rod Jo Moody Apiaries
Rodney & Jo Moody
Cowichan Bay
rodjo@telus.net
250-743-1939
Q

Silver Star Apiaries
Richard Springborn
Vernon
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250-379-2567
N

Similkameen Apiaries
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Cawston
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blairtarves@gmail.com
Q N

Six Legs Good Apiaries
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6legsgood@gmail.com
Q N

Sunnyside Apiary
Nancy Leonard
Bowen Island
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Q N

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Vanderhoof
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sweet02@telus.net
Q N

Van Isle Apiaries & Bee Products
Grant Stringer
Saanichton
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vanisleapiaries@shaw.ca
Q N B

Wild Island Honey Bees
David Macdonald
Salt Spring Island
250-653-9999
dmacdonad@telus.net
Q N Colonies

Wildwood Queens
Donna Moseanko
Powell River
604-344-0622
donna@wildwoodqueens.com
Q N

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

Report from the Beaverlodge Field Day

by Kerry Clark

I think I've attended this event (the 3rd Friday in June) every year since the mid 1980's, certainly since I worked there in in 1989. This year the weather was gorgeous. The whole Peace region had extra warm days approaching 30°C beforehand, but the day itself was a bit cooler: 27°C with a breeze. The number of people attending was well over 100. Here are some notes:

There was a hobbyist corner all morning, with personal, one-on-one answers to many beginner questions, and including practice in marking queens (RED this year) and clipping wings.

The morning had groups rotating between 4 demonstrations:
1) A tour of the new National Bee Diagnostic Centre expansion (a $6 million project led by Grande Prairie Regional College);

The new National Bee Diagnostic Centre facility.

2) The federal bee research staff (Agriculture and Agri-Foods Canada, or AAFC) will also move into the new facility. It will be in full operation by about September;
3) Jeff Pettis demonstrated different queen rearing techniques from the simple scoring (slashing in a grid pattern) of the cells of a frame with eggs, then positioning it with the face horizontal over a box with lots of young bees. (The bees will make "islands" of emergency cells in the appropriately vertical cells, but I guess the top side brood is all lost..? I don't know anyone who has done this). Then he moved to the various cell types for grafting, priming (adding a bit of royal jelly to avoid larvae drying vs not, timing, etc.). I liked his way of showing the age of larvae suitable for grafting using the fingers and thumb of one hand: 3 days to hatch (3 outer fingers), 1 day good for graft (index finger), next day too old – (thumb).

Jeff Pettis giving a queen rearing demonstration.

A frame with eggs which has been 'scored'.

Jeff Pettis demonstrating grafting.

4) Michael Pierson, who has done much of the field work/ colony assessment and measuring etc. for Marta's assessment of queen performance (heat and cold damage etc). He had some great photos of whole frames, with capped cell counts, and a 10 x 10 cell template to get % measures of uniformity of capping. (a FULL side of capped brood is about 3200, maybe 3500 capped bees: this is used to quantify a colony's strength).

The barbecue was great as usual: the event gets good sponsorship and several summer staff do a fine job of implementing it.

BeeMaid had a sales table, NBDC a display, and there were some solid-feeling hard styrofoam supers with RFIDs (Radio Frequency Identification Devices, so someone could know where the equipment is if it got misplaced or stolen) included. Paul O'Neill (P Eng) demonstrated both of these as well as nesting blocks for leafcutter bees, all produced by bpgrower.com (was Beaver Plastics).

The afternoon had many good speakers, too much to mention here. Many were the bee research projects ongoing at Beaverlodge: trypanosomatids (parasites in bees' guts: confirmed as well distributed across Canada and maybe associated with poor wintering/dysentery. The exact effect on bees and colonies is still to be determined in a PhD project just starting).

Steve Pernal presented some research on the carryover of bee virus on comb and spread through air, and the beneficial effects of irradiation to disinfect the equipment (see the interview with Megan Colwell, page 29).

Jeff Pettis did another presentation in the afternoon, this time on bees and new threats around the world, including Tropilaelaps (a tropical Asian mite parasite of bees, probably worse than varroa, and previously thought unable to survive a broodless period) HAS established in Korea, which has a winter, so this indicates that it likely could survive in North America.(!)

Shelley Hoover talked on considerations with spring protein supplementation (in places with low pollen, it can be beneficial); consumption varied among different brands but differences may be insignificant.

George Adamidis (working with Shelley): bee pollination IS valuable for canola even for oilseed production (for which no one pays for pollination) not only for hybrid seed (for which a lot of pollination fees are paid to beekeepers). HOW valuable? Should growers be paying a pollination fee? He hasn't yet done the calculations to find out how valuable oilseed pollination is.

Patricia Wolf-Veiga gave information on the National Bee Health Survey. New this year: pesticide check of bee bread. It was hard for me to interpret, but one sample from BC was much higher than others: acetamiprid, a neonic, is used against sucking insects on cole crops, fruits and ornamental plants, AND on cherry trees where is effective against cherry fruit fly larvae. It is much less toxic than imidacloprid. I don't know where the high residues came from in BC.

Paul van Westendorp had some new stats on BC winter loss (34%), choices of disease treatment, etc. Regarding antibiotic regulations for bee use in BC, "we will have an interesting fall figuring this out."

Alberta Bee Commission (ABC) rep Mike DeJong reported that the ABC is developing a new brand and image (using CAP funding), they will have their own booth at Apimondia, and mentioned their upcoming annual meeting. Responding to a question, he confirmed that no Alberta beekeeper with fewer than 100 live colonies is eligible to participate in the annual meeting.

The Beaverlodge Field Day covers a wide range of beekeeping topics, from beginners to presentations from the top bee researchers in Canada (and often elsewhere). I always come away feeling I've learned a good deal. ❀

BCHPA AGM 2018
Keynote Speakers

Jeff Pettis

I grew up on a farm in middle Georgia and had a love of nature from early on. I was always a biologist, and started to focus on Entomology while I was an undergrad at the University of Georgia. Then it happened: I took a honey bee biology course from Dr. Al Dietz and within one semester I was hooked. I became his lab assistant for that class and then started an MS degree with him as well. That was 1982. I fell in love with honey bees and the hive and the smell and the attempt by us as beekeepers to try and control and assist 30,000 stinging insects. Al Dietz would not let us wear gloves and so you learned very quickly how to handle bees in a respectful slow manner, not to mention that it really connects you to them as they walk over your hands. Dr. Dietz did research on nutrition and also queens, and I have a keen interest in queen health to this day.

With regard to others that have influenced my career, I love the writings of Tom Seeley. He puts bees in perspective, and is one of the best natural history scientists we have seen in a long time. He thinks about bees as individuals, and about the whole hive, but also how they reflect society in some cases. Tom is a great mind and a great guy and we need more of his type in research. Too many people grind up bees and ask questions of the bee mush at the genetic level - all needed and powerful stuff. We need people like Tom to look at things on the colony level, and at the ecosystem level too.

Dr. H Shimanuki and Dr. Bill Wilson both helped me in many ways, and both worked on bee pests and diseases. Dr. Mark Winston improved my writing skills during a post doc at Simon Fraser University and Heather Higo was a great find with the Winston group. If we clone humans, Heather should be the first on the list. I have been lucky to work with many good people over the years and will refrain from naming more of them as I will omit someone.

In helping to start to explore why queens fail, I was surprised by the fact that they can get both hot and cold in shipment, enough to damage the sperm stored in the queen's body. I have been working to document how often this happens, and with the help of Drs Steve Pernal and Marta Guarna we have done some nice research to try and solve the shipping issues. We need good queens and many things play into queen health, including the health of those oft forgotten drones.

In terms of pesticides and bee health, I think that fungicides have been overlooked as have adjuvants. I and others have tested neonics, but I think tank mixes or multiple exposures can be serious. The problem with fungicides is that applications come at bloom time, when bees are in treated crops.

Honey bee pests and diseases have been a major focus of my research, and one of my talks at the BCHPA AGM will focus on a few of them. The overall disease profile of honey bees is always changing. EFB is becoming more of an issue worldwide and we do not understand why. The best defence is bees on good pasture with varied pollen and nectar sources, but good bee pasture is in short supply.

Anicet Desrochers

My parents got their first hive the year I was born. Those bees became mead producers until my sister took over that business, and I began helping with honey production at a young age. I always felt happy and confident with bees; what I learned more with my parents was entrepreneurship.

In 1999 I graduated from the beekeeping technician program at Fairview College, with former course coordinator Denis McKenna. Following that, I took the Bee Masters course at Simon Fraser University with Mark Winston. More recently, I have spent 2 years in Northern California, learning the specialization of queen breeding with my mentor Rick Shubert, and also with the New World Carniolan fellow Sue Cobey. Queen bee production has become my main focus, and now Miels d'Anicet is the largest queen bee producer in Canada, with about 2000 mating nucs producing around 10,000 queens annually.

Our 1500 colonies are also used to produce certified organic honey. I have been working with local farmers and landowners to protect our certification, but for them it also brings new opportunities such as the creation of a certified organic buckwheat seed production association. They need bees for pollination seed potential and I do good crop on it; it's a good cooperation.

My partner in life, Anne Virginie Schmidt, is co-owner of the company and manages human resources from the honey house to the sale and marketing of our brands and lines. Without her, nothing would be possible in terms of diversification. We have developed gourmet honey lines, apitherapy cosmetic lines, and have a retail boutique shop at our farm. We also run a honey-based restaurant which is open for 4 months of the year. We hire up to 35 employees in the crazy summer months. My 9 year old daughter Melia is also a part of the business; she is our inspiration to be better people and gives us strength.

I am a beekeeping consultant in the winter months, working with NGOs as an advisor on beekeeping management, IPM in organic beekeeping and queen rearing in places such as Tanzania, the Philippines, Mexico and Jamaica.

In the last 15 years I have introduced multiple bee stocks to our operation, such as Primorsky Russian bees, Minnesota Hygienic Spivak lines, VSH lines from the US and Quebec, New World Carniolan lines from Sue Cobey and selected stock from Canadian colleagues. We've been mixing the genetic pool of all these since then in order to find the most suitable bee lines every year. There have been some good and bad choices, with lots of experimentation.

Other Guest Speakers will Include:

Zac Lamas will be bringing to the BC Honey Producers Association AGM a wealth of practical knowledge about small-scale and commercial beekeeping, as well as research work he is doing as a PhD student at the University of Maryland. He works part time as a technician at the USDA Beltsville lab, researching how physiological changes on the individual level can change social behavior on the colony level. He is currently investigating this by targeting brood with fungicides, and looking at the physiology and behaviour of these individuals. Additionally, Zac studies mite preferential feeding. His talks for the BCHPA will be centred around practical beekeeping methods.

Dr. Marta Guarna is a Research Scientist with Agriculture and Agri-Food Canada (AAFC) and an Adjunct Professor at the University of British Columbia (UBC). Prior to joining AAFC, Marta was Scientific Director of the Bee IPM project in Dr. Leonard Foster's lab at UBC, where she was integral in leading initiatives on honey bee breeding and proteomics. Marta's collaborative research focuses on honey bee queens, emerging pathogens, and more recently on bee health & pollination. Her talk will focus on what she and her team have learned this summer looking at blueberry pollination and bee health.

Dr. Shelley Hoover is the Apiculture Unit Lead for the Alberta Ministry of Agriculture and Forestry, in Lethbridge, Alberta, and is also the President of the Canadian Association of Professional Apiculturists. Her current research focuses on honey bee health, breeding, pest management and nutrition as well as canola pollination. Dr. Hoover completed her PhD on honey bee worker ovary development, nutrition, and behaviour at Simon Fraser University. Shelley will speak about studies she has conducted on comparing different protein patties, as well as the ins and outs of trapping pollen for sale.

Gerry Rozema is a beekeeper from Campbell River with a passion for understanding details. He and his wife Christina own and operate Rozehaven Farm, a small plot of land located south of Campbell River, near the Oyster River. Gerry's background is in computer science, and they have been running a scale hive for the past few years which he posts about on their website, rozehaven.ca. He recently become interested in the mechanics of colony build up in the spring after seeing a presentation by Randy Oliver, and has been working on modifying a graph that Randy created to better reflect his climate conditions. He will speak on understanding the mechanics of both colony growth and splits.

The Blueberries and the Bees

by Ali McAfee

Thousands of honey bee colonies arrive in the Fraser Valley's blueberry fields every spring, but beekeepers are worried this crop may be harming their bees.

Our first day of field work in Agassiz, BC. The bees are clingy in the cool morning air as we assess the 40 colonies established from New Zealand packages, which are not engaging in blueberry pollination this year. Left to right: Ryan Riley, Bradford Vinson, and Heather Higo. *Photo by Alison McAfee*

My alarm only managed to announce one ring before I slapped it off. The clock read 3:45 am, and there was no time to waste. Bleary-eyed, I threw together a thermos of coffee for the road and grabbed the day bag I had packed the night before, complete with sunglasses, 2 bottles of water, granola bars, and a pillow for the long car ride ahead. My colleague, Bradford Vinson, arrived to pick me up at 4:00 am on the dot. I jumped in his pickup truck and we headed out to the Valley.

Bradford and I were bound for the blueberry fields in Agassiz, a small town in the Fraser Valley of British Columbia, two hours east of Vancouver. There, forty honey bee colonies were waiting for us – all New Zealand packages established earlier in the year – which had just been placed in the blueberry plots to fulfill pollination contracts.

Blueberries are Canada's biggest fruit export, generating about $400 million in revenue annually. Most of those berries are grown in BC and rely on honey bee pollination for reliable fruit set. But over the last few years, beekeepers have voiced growing concerns over the health of their blueberry-pollinating colonies; in particular, an unusually high incidence of European foulbrood (EFB) disease and a yet-unidentified "snotbrood disease," which looks similar to EFB but comes back as negative in diagnostic lab tests. Some beekeepers have even indicated that they will decline to participate in blueberry pollination in the future at a scale that could create a major pollination deficit. Too many commercial beekeepers have reported similar concerns to ignore, and it's time for the issue to be investigated with scientific rigor.

A sample of bee bread for agrochemical analysis. From each colony, we take thirty cells of the freshest packed pollen we can find, spread across three different frames. *Photo by Marta Guarna*

Heather Higo, a Project Manager in Leonard Foster's lab at the University of British Columbia, and Marta Guarna, a Research Scientist for Agriculture and Agri-Food Canada are leading this project, and met us in the field to help with the long day of work ahead. We were about to interrogate these colonies for the five most prominent indicators of colony health we could think of: pollen quality, honey quality, amount of brood, presence of diseases, and the size of the adult population. The previous day, we had sampled and measured the same things in forty colonies which were established from the same package source but spared of any agricultural pollination duties. As more Fraser Valley beekeepers got the call to move their colonies into the fast-approaching blueberry bloom, we evaluated a further 120 hives with various genetic origins at four other field sites, creating one of the biggest experiments on bee health in blueberries to ever be conducted.

This isn't the first time that beekeepers have questioned the impact that blueberry pollination has on their colonies. In the 1980s, Gordon Wardell devoted an entire PhD thesis to the topic of European foulbrood's association with blueberry pollination in Michigan.[1] He found that there might be a link between the acidity of the pollen and EFB susceptibility; that is, larvae on a diet of less acidic pollens (like blueberry and cranberry, pH 6.0-6.4) were more susceptible to the disease than larvae on a diet with more acidic pollens (like alfalfa, pH 4.4). Interestingly, he found that the same trend held true for more acidic and less acidic pollen patty supplements. In his thesis, Wardell proposed that the mechanism could be rooted in the diet's ability to change the acidity of the larva's gut, once ingested.

The logic is that *Melissococcus plutonius* – the causative bacterial agent of EFB – thrives in less acidic conditions, so the less acidic diet may be having a Goldilocks effect. It's making the larval gut environment perfect for *M. plutonius* to multiply. Likewise, the more acidic diet was making the gut less appealing, offering a protective effect. Based on these findings, Wardell developed a nutritional supplement – MegaBee pollen patties – with a carefully adjusted pH to

help counteract the low acidity of blueberry pollen. It's still on the US market today.

Wardell's experiments were easily the most detailed investigation into the link between EFB and blueberries, but they weren't the last. Dean Polk, a county agent at the New Jersey Agricultural Experimental Station, reported that similar blueberry-associated EFB and "snotbrood" concerns are being raised by beekeepers on the East Coast of the US. Polk raised this point at the Entomology Society of America conference in Denver, Colorado last November and had conducted a small-scale field experiment to investigate the issue.[2]

In Polk's study, the researchers monitored brood area and pesticide residues in commercial hives for the blueberry and cranberry pollination rounds in 2015, '16, and '17. They found that the colonies' brood areas decreased during the pollination period; however, their ability to draw further conclusions was limited, partially because relatively few colonies were sampled and partially because there were no comparisons to colonies from the same source, but which didn't participate in blueberry or cranberry pollination. And that is a very important comparison to make, because otherwise skeptics can (reasonably) argue that any decline in colony health could be simply due to other environmental factors like a long bout of bad weather or an outbreak of EFB across all colonies – not just those in blueberries.

So, while concerns over bee health in blueberries have been voiced before, this is the first time it has been investigated at such a large scale. So far, whether there is a significant difference in disease incidence between blueberry pollinating and non-pollinating colonies is unknown. That's what we hope to find out, and if so, what we can do about it. To get a head-start on addressing the latter, we are not only measuring the health of colonies in and out of blueberries, we are also testing if Wardell's MegaBee pollen patties can improve colony outcomes in a large-scale, industrial setting, whether the blueberry-pollinating colonies are more EFB-afflicted or not. After all, pH might not be the only benefit of using a pollen supplement.

The team gets started on field work just as dawn is beginning to break in beautiful Agassiz. These 40 colonies are from the same New Zealand package source, but have just been placed in the blueberry fields. Left to right: Karina Nielsen, Shal Chaudhary, Heather Higo, Bradford Vinson, and myself. *Photo by Marta Guarna*

Blueberries are a notoriously difficult forage source for honey bees. The opening of the bell-shaped flower is usually too narrow for honey bees to efficiently access the anthers (the part of the flower that produces pollen). Kyle Bobiwash, a researcher at Simon Fraser University, published a paper in the Journal of Economic Entomology last year showing that when three species of managed pollinators (*Apis mellifera, Bombus huntii*, and *B. vosnesenskii*) were placed in blueberry fields, honey bees brought in the least amount of blueberry pollen per load.[3] *B. huntii* was the clear winner in terms of collection efficiency, bringing in an average of 3 times more blueberry pollen grains per load than honey bees. This is at least in part because some *Bombus* species are able to utilize "buzz" pollination, in which they grab onto a blueberry bell and vibrate their wing muscles to help release the pollen grains, without having to rub against the anthers.

If honey bee colonies retrieve relatively little pollen from blueberries despite being located in a sea of bushes, then the relationship between blueberry pollen pH, the larval gut environment, and *M. plutonius*'s preferences may not be as straightforward as it seems. Bobiwash's study showed that blueberry-pollinating honey bees were only bringing in about 15% blueberry pollen, relative to all the other pollen sources. It could be that it still causes enough of a pH difference to increase susceptibility to EFB disease, especially considering that many blueberry-pollinating colonies move to cranberries next, which are another high-pH pollen source. However, it could also simply be that the honey bees become generally pollen-deficient during their time in the high-bush fields, since they (presumably) need to travel farther than normal to escape the blueberry desert and forage on better pollen sources.

Even though honey bees bring in a lower per-capita load of blueberry pollen, they are still effective blueberry pollinators. George Hoffman, from Oregon State University, presented his work at the same Entomology meeting as Polk[4] with a talk titled: "Whoops, I stepped in it: A novel mechanism of honey bee (*Apis mellifera*) pollination of blueberries." The title speaks for itself. In the talk, he described how honey bees often get pollen on their tarsi (feet) and forelegs while foraging on blueberries, which is enough to pollinate the flowers. Think of it like taking a pinch of pollen from flower to flower, whilst hardly putting any in your pockets.

MegaBee pollen supplements could have the benefit of not only protecting larvae against EFB, but also making up for what could be relatively sparse foraging in the acres of blueberries. Of our 200 project colonies, 120 of them are for the sole purpose of determining if the patty supplementation is beneficial. By May 8th we completed assessing all the colonies as they were

rushed into blueberries, and about four weeks after that we assessed them again, right before they moved back out. In between, any leftover patties were carefully removed, weighed, and replaced with fresh ones.

We hope that our 200-colony study will help land concrete answers about what's going on with the blueberries and the bees. We expect to have preliminary data analyzed by the end of the summer, but some aspects (like the agrochemical analysis of honey and pollen) could take much longer. We are particularly interested in those results, though, because many people – beekeepers and researchers alike – have suggested that fungicides might be the underlying issue. It's a viable hypothesis, since honey bees do pick up fungicide residues while foraging on blueberry flowers, whether they retain the pollen or not. More and more fungicides (and their adjuvants) have been shown to be less benign than once thought.[5,6]

However, we need to remember not to blame the growers for spraying – they have legitimate needs for fungicides and other pesticides. For example, cool, wet springs (like we had in BC over the last couple of years) can jump-start anthracnose, which is a serious fungal fruit-rot disease. It's one of the most common blueberry diseases in both Canada and the US. But the berries don't show symptoms until it's too late – during or after harvest – when nothing can be done to save the crop. Growers can regularly prune and avoid overhead irrigation, but the best way to prevent the disease is to apply prophylactic fungicides. Growers do what they need to do, and in my experience, it's not because they don't care about the bees. They are simply looking out for their livelihoods. In fact, growers involved in our project are happy to provide us with information on the timing, type, and quantity of agrochemical applications, which will help us interpret our results.

All these factors – fungicide exposure, pollen pH that's too high, and anecdotes of serious increases of EFB and "snotbrood" – are enough to make beekeepers (understandably) question putting their colonies in blueberries again. Julia Common, one of the cofounders of Hives for Humanity who I wrote about previously,[7] is one such beekeeper. On top of her and her daughter's work creating and maintaining therapeutic apiaries in Vancouver's poverty-stricken Downtown Eastside, she also normally contracts colonies out for blueberry pollination. However, her colonies suffered so badly from EFB and "snotbrood" last year that she didn't want to send them back to blueberries. "It's hugely upsetting to see your bees dying," Julia said to a StarMetro reporter last April.[8]

Jeff Pettis, Heather Higo, Abdullah Ibrahim and Marta Guarna.

In the same interview, she said that she considered "walking away from agriculture." However, Julia has teamed up with our study and agreed to place 50 of her colonies in blueberry pollination to help strengthen our experiment. "I began thinking I actually owe it to the bees to stay in agriculture and figure out if there's some way to try and see if we can mitigate all these negative factors that the bees are facing." And if Julia is willing to send 50 colonies to the front line, I'm certainly willing to get up two hours before dawn and work them. ❀

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The Capital Region Beekeepers' Association

Honey bees arrived on Vancouver Island on the steamer, *Pacific*, sailing from San Francisco in 1858. They were reported to be successfully producing a small amount of honey within the first couple of years. The idea for an association of beekeepers on Vancouver Island and the Lower Mainland took shape in 1916, and the BC Beekeepers, later to be called the BC Honey Producers' Association, emerged. Over time, other geographic areas in BC created clubs, and in 1973 the Victoria Division of the BCHPA was launched. Dues for the year were $5.00 and the debate over its name had already begun.

Now called the Capital Regional Beekeepers Association, our 200 current members include backyard beekeepers, commercial pollinators and those selling honey in large quantities to retailers. Monthly guest speakers have included scientists, educators, medical practitioners and our own expert club members, but most importantly, members meet other members and combine their knowledge on the practice of beekeeping.

Our members have been present at many of the annual local craft and garden fairs, in classrooms, and meeting with youth groups to promote understanding of bees. With the public eye still very much on the health of pollinators, we will continue to grow as a club and reach out into the community. The following are just a few of our many members.

Bill Fosdick

I joined the CRBA about five years ago, and have been President of the club for the last four. When I got started with bees I looked for the location of nearest club and found that it was very close to my home. I went to my first meeting in February and was on the executive by the time the meeting wrapped up.

Hive tool of choice?
It's probably my bee box - a tool box I built to hold my stuff. It is like an old carpenters tray but is designed to hold four frames on one side to swap when I am working with the hives. It also holds my queen marking equipment, hive tools, marker, notebook, smoker and lighter.

What is your favourite honey?
Whatever honey is on the end of my hive tool. There's nothing better than warm honey out of the hive.

How many hives are you running?
Ten hives that I manage together with my bee buddy, Brad. I would always encourage people to work with a partner. It's great to have a knowledgeable mentor but we don't all have access to someone like that. A second person gives extra hands and eyes when managing the hives, shares equipment when a swarm demands extra boxes or frames, and also shares knowledge from different sources.

What is the main nectar source in your area?
My neighbourhood used to have a lot of gardens with all sorts of flowering plants but the deer have ended that. The deer have been a growing problem in the city, stripping plants and destroying bee forage. There is a little chestnut, linden and blackberry. In July a lot of club members, including myself, take our hives out to the forestry roads near Jordan River to feed on the fireweed since there is nothing for them in town.

Smoker fuel used?
I like to light my smoker with the paper dividers that come with wax foundation and then use old coffee bags that Larry Lindahl offers at the club meetings.

Preferred method of swarm control?
My preferred method is to split them before they swarm or at least have them go into one of my swarm traps – and lastly, grab them out of my neighbour's tree and bring them home in another box.

Do you use queen excluders?
I have used them. I prefer to build up the brood boxes to a level where the queen stays below the honey line and the foragers can come and go with a little less interference. Usually two deeps or three dadants will be enough space for the queen, and her brood cells will form a natural arch crowned by honey. You can often see the corners of brood frames showing capped honey. Once that top honey barrier forms, she will not cross it, and the bees will store honey above that line.

Jody Aylard

I live with my husband on an acreage in North Saanich on Vancouver Island. It is the perfect property for me to pursue some of my life interests such as gardening, beekeeping and birding.

I started keeping bees five years ago. I first joined our local bee club and took a course before buying two nucleus hives. It was a big help that a close friend had also recently started beekeeping. We have learned lots by working together on our hives.

Favourite honey?
Blackberry blossom.

How many hives?
4 - 7.

Smoker fuel?
Burlap and dried lavender.

Queen excluders?
Not regularly. In strong hives I have occasionally used a queen excluder to isolate and find the queen for splits.

Best tip?
Raise your own queens. It is not difficult, even for beginners. The results are healthier bees and colonies that are adapted to your local environment.

Pamela James

I am a part-time Optometric Assistant. We live in a great area in Sidney with a lovely common garden, so perfect for beekeeping. This is our third season. After our second season, our hive was invaded by wasps and the fall brood was eaten. It was an overwhelming thing we were not able to stop and it prevented the hive from making it through the winter. This spring we decided to have two hives, and have gone to greater lengths to prevent wasps from invading. Beekeeping has been a long time interest. Fortunately, we were able to connect with the local club and have a great mentor who has made all the equipment and never seems to tire from our endless questions!

Main nectar source?
The hives are on a berm in a common garden with lots of fruit and veggies, and blackberries form a hedge.

Smoker fuel?
Hemp for the smoker, but in the summer it seems that a light sugar water spray is appreciated by the bees (and is less of a fire hazard).

Sting remedy?
Good question! I react badly...best thing so far has been to prevent the sting by making sure you're well covered. Full bee suit, boots or extra socks and gloves.

Swarm control?
Each situation is different. We had two swarms that were successfully scooped into small hive boxes. The later in the season this happens, the weaker the hive seems to be going into the fall.
Being watchful and making sure the hive has enough space and food are good swarm prevention thoughts.

Do you run nine or ten frames in your brood chamber?
They seem to prefer 10. If there are 9...they seem to use propolis to glue things together, or burr comb to fill in the space.

Queen excluders?
No. The brood nest seems to need the room to expand. So far, we haven't had the experience of using an excluder and having an extra super for honey.

Best tip?
Have a mentor. Someone who has already had the experiences you need to have to become a better beekeeper. They are a great sounding board and source of information.

Mark Reuten

By day I build and repair wooden boats and teach wooden boatbuilding. By night I torture a banjo or hide out in my workshop making a mess that I will have to clean up the next day. I started with bees about 7 or 8 years ago with a gifted swarm, which I housed in a top bar hive.

Favourite honey?
When I get maple, I hoard it. I will take off a batch early, or else sort the dark, later crop from the light. The colour of the maple honey is very light, and often the viscosity is a little thinner. I find the flavour very bright, almost so sharp that it is a little shocking in sweetness. The honey I get later, when the blackberries are in bloom, is quite dark and very earthy in flavour. Kind of a molasses type richness.

How many hives?
I like to keep it to four but I often grow to eight or ten once the flow starts. I started with the top bar hive because of low cost of entry and the reading I was doing. I switched over to Langstroth after a couple of years, mostly because I couldn't find any good management advice for top bar. Now I understand enough of the nature of bees that I could go back if I wanted to. I tried using a hybrid system one year - Langstroth supers on top of a top bar hive. I sometimes use top bars in my Langstroth supers when I run short of frames, and it works fine in dadants and smalls. The comb gets way too heavy in deeps. You've got to stay on top of preventing burr/bridge comb though.

Main nectar source?
Blackberry is probably the biggest.

Smoker fuel?
Burlap if I have it. Leaves and grass if I don't.

Sting remedy?
Grit teeth and swear.

Swarm control?
Mostly frame manipulation, adding foundation or empty comb to brood areas, and moving honey laden frames up or out, but I resort to splits if they don't cooperate.

Queen excluders?
Not always. I mostly use excluders when I want to keep the queen from chimneying the brood area or just prior to honey harvesting. I'm not very consistent or scientific about it.

Best tip?
Don't panic and avoid most internet discussion. Stick to local advice as much as possible.empty comb to brood areas, and moving honey laden frames up or out, but I resort to splits if they don't cooperate.

Sheila Miller

I am a relatively new beekeeper so I'm on a learning curve. In my professional career I was an educator and served in a school district support role, and later was Director of Instruction. I started beekeeping 2 years ago, after my retirement. I am very concerned about the plight of honey bees given all the challenges they face in this day and age, and like many beekeepers, I love honey! There is so much to learn about honey bees. They are so industrious, persevering and beneficial to us.

Hive tool of choice?
Right now I am using a Husky 9-in-1 paint tool. Speaking more figuratively, I feel that the best tools are our fellow beekeepers and our Beekeepers' Association, where we learn from each other. The recent formation of neighbourhood groups should be a good source of ongoing support in this way. It's a way to potentially provide mentorship, but is just is in its infancy. I have already benefitted from hosting a few people at my place.

Main nectar source?
Neighbourhood trees and flowers. Not far away are many small farms in the Blenkinsop Valley. I live in East Saanich in the Mount Doug area.

Smoker fuel?
Thus far I have not had the need to use a smoker. Currently I am using a spray bottle of water.

Best tip?
So many valuable tips it's hard to determine what would be the best one. Providing some of the mashed comb from hand extraction for reuse by my bees worked well.

Werner Grundlingh

I'm an immigrant from South Africa and have lived in Victoria since 2006. I've been involved in beekeeping for around 5 years and it's been an interesting and worthwhile journey.

What is your favourite honey?
I don't consume that much honey compared to my wife. I enjoy the process from start to finish, but only eat honey occasionally. When I do eat honey, it'll be whatever's available. In most cases, this is fireweed. If I had a choose a favourite, it would be our local garden variety honey we call wildflower.

Smoker fuel?
Dry grass and newspaper. Pack it in tight and it should last long enough, but we rarely need it. Only for the testy hives. If there's a fire ban and I can't use the smoker, I try to move as slow as possible around more aggressive hives. But sometimes there's just no way getting around it. In those cases I have to suit up fully (usually I just wear a half-suit and no gloves). But if there's no ban on using a smoker, that's the easiest.

Sting remedy?
My wife makes a balm that I've been remiss in using more often. But that's what I use when I remember.

Swarm control?
Splitting, which seems to be more concession than control. We've had mixed success either way, with a colony swarming even after splitting. There are times when lots of room still doesn't cut it.

Queen excluders?
We have used them, but now we don't. With uniform equipment (only mediums), rearranging brood and honey frames is not a problem, if the queen ends up laying higher than anticipated.

Best tip?
Don't overthink things. Ask two beekeepers and you'll get probably three opinions. So consider making a decision that is logical for your situation and go with it. If that decision doesn't work out (for whatever reason), learn from it.

Karen Grundlingh

I was born and raised in Victoria, and with the exception of one year in South Africa, I've lived here all my life. In 2012 my husband Werner and I initiated a bylaw change in our local municipality to allow backyard chickens. When the change was eventually made, the municipality had added a clause about bees, allowing us to keep them in town. We thought it would be fun, so we got a couple colonies...and then a couple more, and then some more. We are keeping 15 now.

Favourite honey?
The honey from Maple and Arbutus in the early spring.

Best sting remedy?
Venom Injection Therapy - I'm allergic to bee stings!! To take away the pain, I use a homemade salve made with cottonwood bud resin and beeswax. It takes the pain away fast.

Swarm control?
Colony management by splitting/false swarms. I'd like to try a Snelgrove board next season.

Queen excluders?
No - my queens have the run of the hive.

Best tip?
Have patience, and work gently with the bees.

Chris Berghuis

My family has been living in Victoria for six years. My son and I love the adventures that are part of beekeeping. One of my sons wanted to get bees for years, so we finally got a hive a couple of years ago. We occasionally blog about it on www.beeginners.ca.

Hive tool of choice?
I love the frame holder that I hang on the side of the hives during an inspection. It's a simple rack (2x4 and bike hooks) that makes managing frames much easier.

Main nectar source?
Our neighbours all love having bees in the area so they have been planting all sorts of bee friendly flowers and plants. Some are even leaving the clover much more than before. There are a lot of blackberries in the area but I think the nectar source is somewhat diverse (near Beaver/Elk Lake).

Smoker fuel?
At the recommendation of a CRBA member, I tend to use a water mister with some peppermint in it. Works well and cools me off on a hot inspection day! When I do use a smoker, thanks to the recommendation of another CRBA member, I tend to burn burlap.

Sting remedy?
Hoynes Dark Matter. But seriously, a little ice on the sting and Benadryl seems to do the trick.

Best tip?
I think the best and most helpful thing for me has been being part of the local bee club (CRBA) and making the effort to get some education. The bee course at Royal Roads (taught by a CRBA member) and a range of books and online resources have been very helpful.

Another tip/frustration? The joke about asking two beekeepers an opinion and getting six is true. As a beeginner, I wanted someone to tell me, "do this, do that…" but that didn't happen. Many suggestions and versions of techniques makes beekeeping a rich activity but a bit challenging to start out. I guess it's a reflection of the complexity of the amazing creatures known as *A. mellifera*.

Barry Denluck

For the last 20 years I operated my own business as a computer network consultant, managing many computer systems across Canada. I enjoy solving complex problems. It turns out that managing honey bees on the South Islands is very relaxing, but by no means a trivial challenge. The only thing I know for sure is that there is so much more to learn.

My wife got me started with bees. She is a passionate gardener of flowers, and her friend Elaine kept bees and had an extra queen. She sent me a web link for a beehive design, which I built, and we installed a mini nuc from her bees. After about 5 consecutive mornings with my tea, observing the wonders of a bee colony, I was hooked for life.

Hive tool of choice?
Multi function paint scraper.

Favourite honey?
Western maple.

How many hives?
23, hoping to expand to 50 now that I am retired

Smoker fuel?
Recycled organic burlap.

Swarm control?
Proactive split to emulate a swarm.

Queen excluders?
Definitely, sometimes metal, sometimes plastic and sometimes a honey super.

Best tip?
My greatest enjoyment has been teaching through the BCHPA Instructor program. Sharing knowledge is an amazing form of gratification. If you every have an opportunity to mentor a new beekeeper, I strongly suggest you give it a try. The resulting happiness and well being is absolutely amazing.

Heinz Kaemmerer

I worked for the German government, in the Federal Criminal Police Office, and immigrated to Canada in 1991. In 1974, I was looking for insects (wax moths) for the Pekin Robins that I bred. I contacted a beekeeper, and this was the beginning of a lifetime hobby.

Favourite honey? I like almost all flavours and colours, except the bitter taste of Arbutus honey.

How many hives? In Germany I had up to 25 hives; here I always keep around 10 colonies and a few 5 frame nucs.

Main nectar source? Manly maple and blackberry. In some years there is also honeydew honey coming in. This is actually one of the best honeys, but not healthy for the bees as winter food.

Sting remedy? Prevention. Don't work in a beehive like an elephant in a china shop; raise gentle bees and select for them. Breed only from the best and don't go by good luck. Don't purchase bees with "Spanish blood" or you will run in trouble with your neighborhood. If somebody gets stung in my apiary it costs him $5.00. This is only a fraction he must pay for a bee sting therapy.

Swarm control? I take the swarm away before the bees go into the trees. When the time is right, I make a split with the old queen and leave the remaining colony alone. 9 days after the split, I check the hive and remove all the queen cells except one. 14 days later, I check for eggs or make a queen test.

The queen test is: I take a comb with eggs (without any bees) from another hive and put it into the testing hive. 4 days later I check for queen cells on this comb. If there are no queen cells, they have a new queen, I am patient because she will start laying soon. If there are queen cells, the bees started again - perhaps she got lost during mating.

Best tip? This is not so easy to answer. First, if someone likes to start with bees because "it's cool to have bees", I would recommend not to start - look for a different hobby. The bees already have a hard time to survive, they don't need more stress.

If you're sure this is the right hobby, look for a beekeeper with several years experience and who knows what to do to keep the bees healthy and alive. Stay away from mentors with few years of beekeeping but talk like having bees for 100 years, you can find this kind of beekeeper on the Internet everywhere.

Start with 2 colonies and slowly build up you apiary. Make your own equipment like the hive boxes, frames and all the other wooden parts. Beekeeping is not only keeping bees in a box.

Shirley Richardson

I lived and breathed bees for about 10 years of active hobby beekeeping. I have no hives at the moment but make myself available to mentor newbees, if asked. I enjoy the company of the interesting people that choose to become beekeepers, and my original mentor was a big part of my own success.

When actively beekeeping I made mead, all sorts of honey products and artistic bee-related projects, like a chicken wire bee about 4 feet long. I was also busy in the club and at fairs. One highlight was always shaking bees with Flying Dutchman. I got started when I took a course in the early 90's, followed by the Bee Masters with Mark Winston, but it may have been in the genes, as I discovered later that my grandfather had been the supplier of creamed honey to The Bay in Kamloops in the past.

Favourite honey?
Salal honey.

Main nectar source?
Urban Victoria is an oasis - flowering boulevard trees, followed by Cook Street horse chestnuts, some Linden trees and then all the lavender, wild oregano and forage provided by good gardeners nearby.

Smoker fuel?
I gave up using a smoker as it was always failing when needed and stuck to water misting, if necessary.

Sting remedy?
I usually go bullet-proof so don't really get stung.

Swarm control?
Checking the bees weekly and drawing out lots of new frames to keep the bees busy.

Queen excluders?
Yes – I always aimed for show-grade honey without pollen.

Best tip?
Two things - draw out good frames to make the hive a joy to work, and be able to recognize eggs.

Carolyn Hissen

I am an urban beekeeper in Victoria with hives throughout the city, which has made me more aware of microclimates and meridian tree choices than I ever thought I'd be. I have had my ups and downs in beekeeping, even quitting when one of my sons had a systemic response to a bee sting. Ultimately, I found a way to keep bees without having them in my own yard (although mating nucs seem to end up here often).

I had wanted to keep bees for several years, but it took a very unsuccessful sugar pumpkin crop to make me notice the lack of pollinators in our yard. We didn't think we could keep convincing our preschool daughter to run around the yard being a pollinator, so contacted the local bee club to see if someone would manage a hive in our yard. Nobody contacted us so I decided to do it myself.

Favourite honey?
Being an urban beekeeper I can't really isolate a single source. Generally I like the darker honeys, with the exception of linden, which, though light, I really enjoy.

Sting remedy?
Get the stinger out quickly if I can and spray the area with water and peppermint oil to mask the pheromone. I used to put honey on the stings.

Swarm control?
In the spring I keep a close eye on the brood chamber, to make sure they are not getting too crowded or starting to backfill with honey, and open up the brood area as needed. I do swarm control splits when I see queen cells, and preemptive splits in booming hives.

Queen excluders?
I don't generally use queen excluders but they have their uses. For me that means that I will put one on if I have a queen that keeps going up the centre of the hive, if I want to run a two queen hive or if I am putting on the first honey super towards the end of the season.

Best tip?
Listen to the bees. They don't necessarily read the same books as you do, but they will tell you what they need. Find a mentor who can teach you to read the comb and see what the bees need, and know your mite levels.

Irene Tiampo

I am a backyard beekeeper in Victoria. I have only 1 hive this year but have had up to 6 hives. I run a property management firm for the family and this takes up most of my time. I have been the Capital Region Beekeepers' Association's secretary and the Treasurer/Membership clerk for the BC Honey Producers Association for the past 4 years. This year I am the convenor and a judge for the honey section at the Saanich Fair.

My interest in beekeeping started in the mid 70s when my late husband and I started an orchard on our farm in Abbotsford. We needed the orchard pollinated and purchased 2 hives from a beekeeper in Maple Ridge. I was uneducated in beekeeping and did not know anyone in the area who kept bees to turn to. My education was reading books on how to collect swarms as my 2 hives rapidly turned into 4 hives.

Bees have always fascinated me with how they run their community. Each individual bee has a task at a certain time in their life. They work tirelessly for the hive. I think it is very interesting that these insects can communicate with each other. How do they know when and what to collect?

Favourite honey?
I like whatever the girls bring in, which I call backyard honey.

Main nectar source?
I live near the University of Victoria, and nectar comes from arbutus, maple, blackberry, lavender, rosemary and whatever else the bees bring in from the neighbourhood.

Smoker fuel?
I do not use a smoker. I have only had 1 hive that I found to be nasty. I use water with either sugar or a bit of mint oil in a spray bottle when needed.

Sting remedy?
I put unpasteurized honey on the sting and then take an antihistamine.

Don Lambert

I am a Dad, avid gardener, teacher, and have been beekeeping almost 10 years now. I am VP of our local club, and I mentor several "newbees". I have dabbled in queen rearing with some success, using the John Harding method, and ran 15 hives through the summer. I got started in bees when a cousin had to move some hives, and one ended up in my backyard. The photo is of the newest beekeeper in the family, Taylor, working the spinner. She is 7 years old.

Favourite honey?
The wonderful Maple honey we sometimes get here in the spring, and/or the blend of honey that drools out from uncapping several frames.

Smoker fuel?
I rarely use a smoker except on aggressive hives or when they are really grumpy in spring and late fall. I usually use a toilet paper roll with some bits of burlap rolled up inside, and a few bits of dried leaves or a few sticks.

Queen excluders?
I do use queen excluders to control where she lays in my queen rearing boxes, and to keep her down below the honey boxes. I like to overwinter in 2 deeps, so excluders often make it fairly easy to set up the bigger hives, to compact for winter, with less manipulation of frames.

Best tip?
If there's 3 beekeepers in a room, there's 5 opinions about how to do things, then listen well, learn as much as you can, but stick to the basics to start, and after a few seasons if you are still keen, then you can try different things. Getting to know bees will change you!

Kate Fraser

I live on a farm in Metchosin with my husband and two young sons. When I started with bees, I knew that I would keep them for the rest of my life. I also wanted to help other people get a chance to enjoy bees. I started a company called Bees Please Farms where I rent out bees to people on the lower Island. I do all of the beekeeping and the homeowners get to enjoy the benefits, including some of their own backyard honey. I meet a lot of great people this way and I love sharing about bees with everyone from kids to retirees.

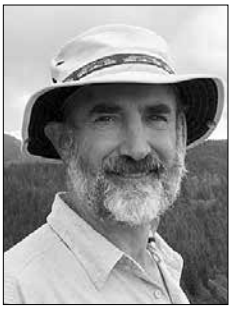
What is your favourite honey?
My favourite honey is cut comb, preferably nice and dark. Cut comb is the only type of honey I sell. I have a spot out in Colwood that consistently produces a dark, rich honey.

How many hives are you running?
Around 66. I don't use a smoker and no longer spray the bees when I enter a hive either. I stopped spraying with scented water this year and found no difference at all in their behaviour.

Favourite tool?
My frame holder. My least favourite are bee escapes. I have had bees get stuck up there and eat up all of the honey instead of coming down. I also can't say enough good things about my Ultra Breeze suit! I don't get stung any more and I don't kill off my bees because they can't lodge their stingers in the suit.

Best tip?
My best advice is to keep good records. I was fortunate to start this habit right off the bat; remembering so many locations and hives is impossible. My renters want to know what is happening in their hives and this way I can give them a complete picture. It also ensures I come to each location prepared with what I need. There's nothing worse than traveling 45 minutes to a location, and then find you're missing a key piece of equipment. ❀

Regional Reports



Peace Region
~ Kerry Clark

The Peace region in BC, like much of the rest of the province this year, had a remarkably quick change from an extended cool period to April 20, to warm weather that extended through May. We even missed the 6 inches or so of snow that often comes sometime in May. Along with all the good things that mild weather can do for surviving honey bee colonies, it also was good for aphids: by the end of May large areas of poplar forest had leaves sticky from aphid exudates.

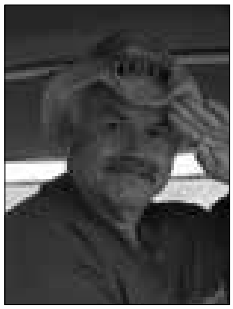
As the summer has developed, what likely is a consequence of all those aphids: wasps have emerged in numbers I haven't noticed in 20 years, both small yellowjackets, and larger black and white bald faced hornets. There is some predation of honey bees, though I haven't heard of any colony losses.

Honey crops in the Peace should be at least 150 to 200 lbs for a full sized colony; plants that were 3 weeks behind in late April caught up by June, and we have had some good soaking rains to keep things green. There is also good looking and profuse clover, even in volunteer situations.

The Beaverlodge (AB) field day was very well attended and a feature this year was the opening of an expanded National Bee Diagnostic Centre. The foulbrood research project BCHPA is cooperating in will be going full steam by now (if you do happen to find a colony with any kind of foulbrood, send them a sample - see our website for information).

There's still more to learn and pass along to beginning beekeepers, the numbers of which continue to grow. The cool spring resulted in fewer nucs, later than hoped for, but colonies caught up and forage conditions have been very good through July, so there are quite a few new beekeepers active.

I see there is a fine lineup of speakers for our BCHPA Educational Days in Victoria in October. I hope you will come and enjoy the event.



Prince George
~ Barry Clark

Here's an update on what has been happening in our neck of the woods. It is July 31st as I put the final words to this report. We have had another scorcher of a July, however with the cold and very wet April and May, and warmer but still, wet June, we still have nectar. Yippee!! For us anything over 25°C is hot, and it has been between 25 and 30°C for a good portion of July. On Sunday it was 33.3°C, I know because I was stuck in a tractor all afternoon baling hay!

With the hot July, wasps and hornets have started to become a nuisance earlier than usual. This week I decided to abandon my 'live and let live' ethic where they are concerned. As of today I have wreaked havoc upon 3 hornet and 6 wasp nests in the vicinity of my apiary. The hunt continues.

The clover is coming to an end, fireweed still has a few weeks to go, and goldenrod will bloom until the first frost. The bees are still very busy and in my observations are not yet robbing.

News from the Club: there was a successful "Day of The Honey Bee" exhibit at the Farmers' Market in May. Thank you Randy for making that happen, and thank you Gerald for the donation of bees for the live bee exhibit. Probably the best attended Field Day our club has ever held took place on June 2nd at the apiary of Chris Morris and Alton Ramsay. Bee Inspector Diane Dunaway worked her magic, and it was a huge success. There is another one planned for Sept. 8th at my place. The club is planning to do its exhibit at the BC Northern Exhibition again in August.

Planning is well underway for the 2019 BCHPA AGM and Education Days to be held here in Prince George. David and Linda DeLeenheer are chairing our local committee and the excitement is building.

Well that's about all for this edition. I plan to take my honey off this week and test for mites. Next time I will let you know how everyone's harvest went, and the state of their bees.

One more thing, we now have a bee inspector for the Fraser Fort George area. The inspector (yours truly) can be contacted by email: m_bclark@hotmail.com, cell or text at (250) 301-6266 or landline (250) 967-4141.

Careful with your smokers - it's hot out there.

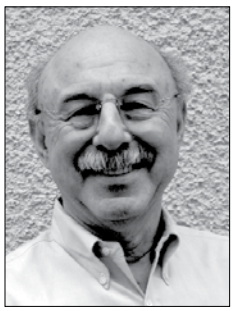
Terrace
~ Rudi Peters

Our winter was hell, and we had no spring, but are we ever having a summer. We have had long stretches of warm sunshine, although at times a bit too warm. Those who have moved their hives up into the fireweed patches are reporting weekly gains of anywhere from 10 to 30 lbs of honey. If we can get some rain along with this warmth, we could get another three weeks of nectar flow.

Our new Bee Inspector has made his first tour through our area. Most have embraced this new resource and have taken advantage of us having an inspector. It has cut down on the number of phone calls that myself and some of the other

larger operators have been receiving from hobbyists seeking assistance in managing their beehives.

The real issue that is sitting on the horizon for us up here is the risk of forest fires. They are calling for thunderstorms, which can produce fires, and as dry as the mountains are it could be a potential for real concern. Here is hoping we get rain without the lightning.



Metro Vancouver
~ Allen Garr

It was the Richmond Beekeepers' Association's turn to sponsor this year's field day for themselves, the Langley and the Surrey clubs. While attendance was a modest 30 folks, the weather was splendid on July 22 and the setting was a most bucolic park at Woodwards Landing, on the edge of the Fraser River dyke in Richmond.

There were small, well-planned demonstrations of flow hives, mead making, honey extraction (don't lose that little ball bearing at the bottom of the extractor, and wash it out with cold water only), how to use a refractometer and the Richmond club's fancy new microscope, and of course, a hive inspection.

There was informal muttering amongst a few about the annual and growing onslaught of wasps and what new-fangled, or old fashioned techniques there were for beating the buggers back. Talk covered traps baited with wasp-queen pheromone, screens stretched across the entrance with openings that would befuddle wasps and robbing bees, and, of course entrance reducers.

Another, smaller group, confessed that this may be their last year keeping bees - we all get older and, in spite of the romance of it all, can no longer take the heavy lifting or the time consuming work - and pondered what to do with their hives.

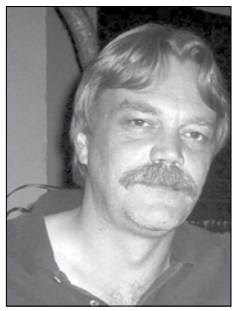
There was some talk about the weather, of course, we are beekeepers. We appear to be in the midst of what has become a regular summer drought. And while our country cousins are still benefitting with a bit of a nectar flow from the tail end of the blackberry bloom, along with purple loosestrife in the ditches and goldenrod in the fields, for many urban beekeepers it has been reduced to a trickle for almost a month. If you didn't benefit from the warm, blooming month of May, well, June was cold and wet, and it's all but over now.

So it is on to taking off what honey is still to be extracted, then winter preparations: treating and feeding and wrapping those hives that appear strong enough to make it, and figuring out what to do with those that are not.

North Okanagan
~ Richard Plantinga

Our spring weather was sporadic, resulting in some poor mating conditions and slow buildup. Our flooding problem was a bit less than elsewhere, but was promptly followed by very hot weather, starting in July. Kelowna set a new record of having an average daytime high of above 30°C.

So now we are back to dealing with the fire problems and smoke, and having strong colonies just as the nectar flow drops off. Extracting is well underway, and most producers seem to have about average honey yields. We look forward to participating in the IPE in Armstrong on the Labour Day weekend.



North Vancouver Island
~ Gerry Rozema

It's been a busy time as the deadline for BeesCene articles approaches. Summer 2018 has brought it's own challenges for beekeepers on the northern part of Vancouver Island this year, some of which is almost certainly fallout from the intense fire season in the Interior last year. One thing that makes our area on the Island unique, compared to much of the province, is that much of the land is privately owned, logging company-managed forest, as compared to crown land timber lease in the rest of the province. Beekeepers that have traditionally taken bees into the private managed forest land for the fireweed season have found that some of the companies demanded a doubling of the coverage for forest fire insurance. Traditionally they have required a million dollars in coverage; this year they were asking for 2 million coverage. This amount is double what our beekeepers have available through the BCHPA insurance program.

I know in some cases that this was resolved, and some of the traditional fireweed yards were once again available to the folks using them, but in other cases there was a last minute scramble to find new yards farther north where it is crown land under timber lease.

For those of us that do move bees out to the fireweed yards, lower level locations are reaching the end of bloom. We have had a significant run of warm weather with lots of sunshine through the bloom this year, and in areas where water is abundant, flows have been strong. In some areas where the fireweed is dependant on rainfall for water, nectar has been scarce. Higher elevation fireweed is now starting to bloom, but no reports yet as to how the flows will produce in those areas.

Here at lower elevations, for those that don't move bees out to fireweed, summer has been, in one word, hot. With that heat and sunshine has come an endless succession of hawksbeard blooming, and most colonies have been holding their own through a period which has traditionally been more of a dearth. As I write this, we are starting to see goldenrod poking up in ditches, so the hopes for a strong fall flow are high, but fall flows are fickle in this area. Here on Rozehaven

Farm, where we track flows with a scale hive, we have seen a decent flow through August in 2 out of 4 years; hoping this will be the third out of five.

All in all it looks like a reasonably good year so far. We have started preparing colonies for the upcoming winter by managing mites and paying attention to feed requirements, as the bees come home from fireweed with honey removed.

East Kootenays
~ Lance Cuthill

In spite of a prolonged winter with heavy spring losses, here in the East Kootenays we have enjoyed some lengthy spring rains that have prolonged the July honey flow. Beekeepers here are expecting a larger than normal honey harvest. We have had spring bears but no reported losses due to these unwelcome marauders. One of our bee yards had a black bear who must have suffered the joy of an electric fence. We could see where he was attempting to dig under the wire, but gave up before getting to the bee hives. Mother Nature has once again undertaken some unusual prolonged plant growth; the dandelions are continuing to bloom throughout July and in spite of road crews cutting the half-finished sweet clover, we now have a second growth producing another flow.

A very successful field day, hosted by Jeff and Amanda Lee, was held in mid-June in Creston. The mostly small scale hobby beekeepers were treated to coffee, donuts and an interesting look at a commercial extracting plant. Jeff's new hive lifter had all of us curious, and envious after a demonstration. Axel Krause was instrumental in demonstrating hive inspection techniques. With over 200 people having taken the BCHPA beekeeping course here in the East Kootenays, hopefully the Ministry of Agriculture will look into a second bee inspector.

A rare "free" workshop for beekeepers is being sponsored by the Kootenay Boundary Farm Advisors (KBFA) on September 22 in Cranbrook. All beekeepers are welcome to attend. Details on the workshop are planned to be available on their website, www.kbfa.ca.

Fraser Valley
~ Courtney White

In mid-July The Honeybee Centre hosted their annual Honeybee Festival with lots of family friendly activities to engage the community.

The Richmond Beekeepers' Association hosted the Lower Mainland field day on July 22nd at Woodward's Landing in Richmond. They had hive inspections, extracting demos, and mead making information. You could even try out their compound microscope and learn how to use a refractometer. This is the fourth year of having a Lower Mainland field day, with hosting duties alternating between the Richmond, Langley and Surrey Bee Clubs.

By the third week of July the blackberry flow was completely done. In certain areas robbing has started and the bees are hangry and hot. To top it off it looks like another bad year for wasps. As I write this (end of July) we are just coming off a heat wave, pulling honey and starting to get mite treatments on. Popular treatments this year are mite-away quick strips and Mitegone pads.

Local bee prices have gone up again this season, with queens ranging from $40-$50 and nucs at $225-$300. That's it for now. Stay cool out there and enjoy the rest of the season!

Sunshine Coast
~ Allan Cobbin

We've been looking for better weather and now we have it to the extent that we're looking for some rain! Our present drought conditions have resulted in a lower than average amount of honey being brought in compared with previous years, but we are anticipating our usual late summer flow.

We celebrated our 6th annual Day of the Honey Bee on May 26th as planned.We had 2 observation hives and a top bar hive (to demonstrate an alternate hive structure) and sold our club honey as well as our T-shirts and coffee mugs. All in all, a most successful day. We had our annual potluck barbecue after our June meeting with Paul van Westendorp as our guest, and he provided his usual sage advice to all.

Thanks to the leadership from our club president Kathleen Suddes and several others, we attended the Canada Day Parade in Sechelt on July 1st with our own float. A picture on the front page of our local newspaper showed Sally Burke (our past president) as the queen bee, accompanied by several youngsters dressed as honey bees! The club certainly benefitted

from this exposure. Unfortunately, too many members were unavailable (too hot, too busy, too many visitors) for us to participate in the Gibsons Annual Sea Cavalcade at the end of July. Perhaps next year.

Our colonies at the Botanical Gardens have provided us with several nucs and queen cells, which we sold to club members. Throughout May and June, Harry Meier made excellent use of our new double observation hive, and gave talks at our site to ten school classes from Langdale, Gibsons and Sechelt. As a result of these sessions our next generation will have an increased knowledge about bees, colony products and the need for and value of pollination. We will hopefully be introducing them to a new and fascinating hobby.

At our next meeting on August 13th we will remove our honey and Kathleen has graciously agreed to allow us to use her facilities for extractions. We have once more agreed to participate in the Bot. Soc's Fall Harvest event over the Labour Day Weekend.

I understand that there has been a recent increase in beekeeping in the Powell River part of the Sunshine Coast. To that end I contacted Donna Moseanko who has been selling both queens and nucs to new and former beekeepers in that town. She notes that there are now several hobbyists but as yet they haven't established a club. Unfortunately we lost the excellent services of Caroline Stoddart who served as a part-time Bee Inspector for the Sunshine Coast for many years, and as yet we have no replacement.

That's about it from the too sunny Sunshine Coast but remember that it was Winston Churchill who said: "Success consists of going from failure to failure without loss of enthusiasm." Good advice for all beekeepers!!

Cariboo
~ Ann Carter

Summer's arrival has brought a sense of relief to Cariboo beekeepers after a year of struggles. Although spring was late and slow, May hit with a bang: a wall of dry heat. Colonies built up well and the late spring meant a smooth transition to the major nectar flow without a significant dearth period.

June was wet in most of BC, but the moisture brought sighs of relief from wildfire anxieties which built up in May. I have never seen such massive alfalfa, mustard and sweet clover displays and they persisted nicely with the June and July rain/heat cycles.

New beekeepers are reporting great nuc buildups, which inevitably catches a few people off guard, leading to swarms. In late July a week of extreme heat seems to have caused some colonies to swarm or abscond, despite having space, a good nectar flow and no evidence of swarm preparation.

The honey crop appears to be above average by early reports, and the forecast rain followed by heat will hopefully keep this trend going for the remaining season. Cooler nights in August usually lead to a second bloom of many heat-affected floral sources and better forage. Interestingly, the anticipated fireweed crop from last year's fires hasn't appeared in most areas, presumably due to the very hot fires burning deep into the ground and sterilizing the soil. One Riske Creek beekeeper, living in an extensively burned area, does report great balsamroot blossoms in the grasslands and fireweed in the burned timber areas.

The Central Cariboo Beekeepers joined the local Seedy Saturday event to celebrate the Day of the Honey Bee a little early in Williams lake. The beekeeping display and observation colony are always crowd favourites.

The club had field days demonstrating nuc installation and management, plus a colony splitting demonstration. A honey extraction demonstration field day is scheduled for early August.

One very successful local activity has been beekeeping demonstrations with school groups at a local community garden/agricultural activity centre. The kids have an amazing knowledge and curiosity about bees and a complete lack of concern about stings! Our scheduled 20-30 minute sessions seldom last less than 90 minutes as the children just have so much interest and enthusiasm!

Strong colonies, a good honey crop and contented bees are making for happy beekeepers in the Cariboo this summer.

West Kootenays
~ Gavin Firkser

As May seemed to have brought along warm weather and chances for a long hot summer, we in the West Kootenays were grateful to have a mild and wet June to support plant and flower growth, along with a good push for nectar production. Looking back to last year when we had smoke filled air, along with much of British Columbia, we noticed our nectar flow for the current late spring and early summer to be outstanding.

Current temperatures have hovered around the 30s, bringing a much-expected dearth around mid-July as the more predictable dry and hot summer weather has approached. From a recent survey of members around the West Kootenays, in correlation with our later start to summer than last year, swarm season has approached us a bit later than anticipated. With much relief from some our members, this provided a little bit of calm before the storm!

We have seen a continued growing interest with new beekeepers, specifically at the Castlegar Garden Fest where a ton of inquiries came from those looking to take the plunge. Age did not seem to be a limiting factor either, with our observation hive enticing both young and old (but still young

at heart, don't worry). It is an outstanding tool to get the ball rolling with beekeepers-to-be. The observation hive cannot go without mention to the Bee Awareness Society, as they have played such a vital role in creating awareness about bees in our area.

This past spring, the West Kootenay Beekeepers introduced our newest Vice President to the executive, Laena Brown. With enthusiasm fit for 3, Laena has already stepped up and made quite a few appearances at our local events, such as the Pass Creek Spring Fair (a gorgeous event from a growing community), and the Castlegar Garden Fest (mentioned above). Thanks for your hard work Laena!

With a dry and hot summer in the forecasted future, we're trying to keep our bees hydrated and under control. Wishing all the best for the remainder of this busy time of year to all beekeepers near and far. ❀

Classifieds

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

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