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Letter from the editors . . .

“The only logical response to an animal that lives obsessed with avoiding capture is to chase it.” ~ *Jose Ortega Y Gasset*

When my dad passed away in 2015, I was fortunate to end up with many of his books. He wasn't one who was able to connect with others easily but the books gave him a way to communicate. There were very few times he gave me a book when I knew it had made a big impact on him. One of them is a book called *Running After Antelope* by Scott Carrier, an American writer and radio producer who has contributed since 1994 to the radio program *This American Life*. The book is a collection of wide-ranging personal essays, linked by the theme of the pursuit of mystery. At the centre of the stories is his brother, at one time a master's student in biology who is studying vertebrate morphology and has become intrigued by ethnographic accounts of primitive people who were able to run down big game, including the pronghorn antelope, which is generally accepted to be the fastest land mammal in the New World. He asks Scott to join him one summer in field work to see if they can run down the antelope themselves, and reluctantly, Scott accepts. It's a book I go back to again and again because it's full of deep meaning, ironic and funny, and you don't often get all of that in one book.

One of my favourite chapters in the book is called 'little league haiku':

It was between plays. The coach was talking to the offense in the huddle, drawing on his sketch board, reprimanding somebody for screwing up on the last play. We were standing around waiting. We were the defense, and we had no coach. We had three or four formations we'd run, but we never made a call until the last minute. I remember because I made the calls. I was the Monster Man, the free safety, the captain of the defense, and I'd often call one formation as the offense broke huddle and then stand back and wait until everyone was set, the quarterback just going through his count, and then call another formation, just so everything would change shape right before the ball was snapped. This added the elements of surprise and chaos to our attack. It made the offense respect and fear us, and often their plays crumbled under the disorder we caused.

The coach was in an offensive huddle, the sun was going down, and the practice was coasting to an end. We, the Highland Mighty Mite defense, were standing around quietly, minds empty, like twelve-year-old desperadoes waiting for a train. I was standing there spacing out with everyone else, and then I had this new feeling: I was conscious of being inside a shell,

and looking out at the world like my uniform and even my body were just protective packaging. I was in love with the air, the smell of the grass, the warm light in the cottonwood trees at the edge of the field. I remember looking out at Bruce Seymour, our big defensive end who had already reached puberty. He had his helmet tipped up, and his hair was all sweaty, and he was gnawing on his mouthpiece. He turned and looked at me, and I wanted to say to him, "Do you feel it?" But I didn't know what "it" was.

I called a huddle and said, "We're going to do something different this time. We're going to line up in a six-three, but as they get set I'm going to say a haiku, and I want you guys to start moving around, dance around, stand on your head, do whatever you want. We'll kill them. Ready, break!"

The offense came out of their huddle, and we went into a six-three, and just as the quarterback started his count I yelled, "The wind brings dry leaves, enough to build a fire." And my defense stood up and looked at each other and looked at me and didn't do anything.

The coach blew his whistle and yelled, "Whats going on? What's the problem?"

I said, "We're running a haiku."

He said, "A what?"

"A haiku," I said. "We learned it today in school. The wind brings dry leaves, enough to build a fire."

"Why," he said, "would you ever want to do that?"

"It was just an idea," I said. "It didn't really work out like I thought it would. I'm ready to move on, if you are."

That chapter has stuck with me over the years, and no matter how many times I read it, I get the same sense of awe. It's given me a lot to think about.

In the rest of the book, Carrier tells about many travels he's made and mysteries encountered, including what he and his brother discover about the antelope: "Following this herd is like following a school of fish. They blend and flow and change positions. There are no individuals, but this mass that moves across the desert like a pool of mercury on a glass table. Then they split again, bursting into five pieces, and its just too confusing; we can't tell whether we're chasing animals that have run for two minutes or twenty minutes or two hours." They agree that their goal at times seems impossible; his brother develops a heart condition and for a time gives up on the idea, but Scott continues to hold onto it – there is something besides running down an antelope that is worth pursuing. ❀

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



On our cover: The cover photo was taken by Murray Willis at his Pritchard bee yard, looking west towards the South Thompson River. The yard is surrounded with irrigated alfalfa and clover fields, and the honey from those bees won three first place ribbons at the Interior Provincial Exhibition last year - one for honey, one for beeswax and one for a full frame of capped honey.

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From the President

2020! This will be the BCHPA's 100th year in existence, a remarkable accomplishment. In BC we are fortunate to have the continuing support of the Minister of Agriculture Lana Popham, and general public agreement that honey bees are valuable and worthy of investment to improve their health and welfare. The broad beekeeping community of BC has been enabled by establishment of the Bee BC program, seed money to fund a diversity of community scale projects to address local concerns about the viability of honey bees. At our Prince George meeting we saw the results of some of the projects and look forward to more as the projects are completed.

Perhaps you have seen the article published in tribute to Mike McLennan in the summer 2019 issue of BeesCene. I am one of many who knew Mike over many years. He was a great supporter of our association. I recall his tireless efforts in arranging honey cookbook production and distribution, as well as his valuable commercial beekeeper perspectives. We are so grateful to recently hear that Mike arranged for bequests of \$10,000 to each of the BCHPA and to our Boone, Hodgson, Wilkinson Trust Fund. What a generous contribution and a reflection of Mike's unending support of beekeeping.

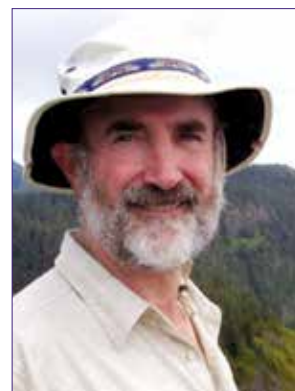
I returned just yesterday from a 2 week volunteer assignment in Bolivia: a mix of tropical and high elevation (8000') beekeeping with mostly Africanized but some European bee stock. A longer trip was planned for November 2019 but was delayed by unrest in Bolivia after their Presidential election.

A re-scheduled January trip was also briefly delayed by flights cancelled for sub -40 cold in northern BC. High priorities there: Varroa management and queen rearing. I had gracious hosts and hope they enjoyed and learned from the relationship as much as I did.

My air travel mid-January and early February overlapped with the surge of a new coronavirus originating in Wuhan, China. We don't know if the 25,000 cases and 500 people dying within a few weeks is the start of a world pandemic as some fear, or whether the situation will recede into history as did the SARS outbreak of 17 years ago.

Our semi-annual meeting organizing team led by Vice President Dan Mawson is working diligently to bring another fine slate of educational presentations to the meeting in Kamloops March 27 and 28. Check the website for details. Part of our Kamloops business meeting will be a progress review of BCHPA member priorities with an opportunity to re-affirm those goals or express new ones. Our association is enabled by the much appreciated contribution of funding announced by the Minister of Agriculture, and our Research Committee (chaired by Heather Higo) and board is able to implement BCHPA member ideas of needed research. We will have a report from one of the projects undertaken last year and we expect to assist several more projects this year and in the future.

Our 2020, 100 year celebration, main AGM and educational days will be held in October in Abbotsford. We already have a top notch agenda of educational speakers arranged by second VP Jeff Lee. Find out more at the Kamloops meeting. Bees be with you. ☼



Kerry Clark
BCHPA President

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Beelines

News from the Ministry of Agriculture

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

Asian Giant Hornet (AGH) - Update

In the last issue of BeesCene, I reported on the discovery of the Asian Giant Hornet *Vespa mandarinia* in Nanaimo in mid-August. With the support and fantastic involvement of the local beekeeper community, the single nest was located and destroyed on September 18. A few stragglers were sighted a few days later but no other hornets were detected anywhere in the area or anywhere else on Vancouver Island since then.

Then, in mid-November I received an alert through the Invasive Species Council of BC website <https://bcinvasives.ca/report>, of a large hornet having been found in White Rock. While all attempts failed to connect with the observer and collect the specimen, verification of the authenticity of the photographic evidence confirmed *Vespa mandarinia*. This find was the first confirmed case of this hornet species on the mainland.

On December 8, I received a report of two specimens of hornets found on a rural property just east of Blaine, Washington. One specimen was dead while the second specimen was feeding at a hummingbird feeder which subsequently flew off into the nearby forest. Finding two specimens at one location at the same time indicate the presence of a nest. This is particularly worrisome as this species of hornet is not expected to winter as a nest. Similarly to the endemic yellowjackets and bald-faced hornets, AGH's nest produces sexually maturing offspring in August and September and the mated queens disperse to winter on their own. Winter surviving queens will then emerge in early spring and establish their own nests. When AGH is capable to winter as a nest, it will have a huge head start in the spring with the potential to develop into a much larger nest.

The dead Blaine specimen was collected by the Washington State Department of Agriculture (WSDA), properly identified and its DNA sequenced. The Nanaimo and Blaine specimens will also be sequenced to determine commonality of origin. Since then, another confirmed sighting of a single specimen was made just west of Blaine. While two other cases have been reported farther south towards Bellingham, neither physical nor photographic evidence were available for confirmation.

BC is working closely with WSDA and other agencies to coordinate surveillance and eradication strategies for 2020. A key component of any successful control and eradication program is the active involvement of local beekeeper communities. It remains a mystery how AGH became established on Vancouver Island and the mainland but it is assumed that introduction took place through stowaways by ocean freighter and railway.

Anyone who finds a large, unusual wasp-like insect is

encouraged to take a close up photograph and email it to paul.vanwestendorp@gov.bc.ca or to the BC Invasive Species Council - <https://bcinvasives.ca/report>. If you can catch the insect, use a jar or any container with a lid. Place in the fridge for 30 minutes to immobilize the insect. Afterwards, take a few close-up pictures and submit for identification.

Submitting Samples for Disease Identification

With spring and summer approaching, beekeepers will be submitting samples for lab diagnostics. Test results can only be as good as the quality of the samples. Don't submit samples with large amounts of debris and foreign materials. Proper packaging is equally important to prevent molds to engulf the entire sample. At the Agricultural Plant & Animal Health Centre no chemical analyses for suspected pesticide poisoning are applied. The Centre only deals with biotic agents.




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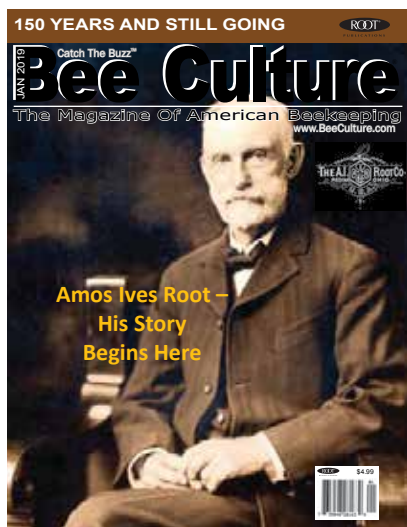
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Samples should be submitted as follows:

Brood Cell Samples

- Samples are normally analyzed for AFB and EFB.
- Select an abnormal-looking brood cell. Use a toothpick and carefully remove the larval remains. Place the cell contents into a plastic sleeve or piece of cling wrap (please don't use a stick or stem from the ground as it will introduce contaminants into the sample).
- Place the plastic sleeve in a normal plain envelope and mail to the animal health centre in Abbotsford (address below).
- Make sure to include your full name and contact details (phone and email) and provide a short description of the problem.
- Don't send frames with comb unless you personally drop them off at the Animal Health Centre in Abbotsford.

Adult Bee Sample

- Bee samples are analyzed for *Nosema*, Varroa mite damage, and other abnormalities.
- Collect a minimum of 50 adult bees, that have recently died or are dying.
- Place the bees in a paper bag (NO plastic) and freeze for 3 days. This allows the bees to dry out on the outside, preventing mold growth.
- After 3 days, remove and allow sample to thaw and dry to room temperature. Place bees onto a paper towel and carefully fold the sides inward. Alternatively, keep the bees in the paper bag.
- Place sample in a padded envelope. Include your name, phone number and email address and a short description about the problem.
- Mail or courier to the Animal Health Centre in Abbotsford.

Ship samples to;

BC Ministry of Agriculture "BEES"

1767 Angus Campbell Road

Abbotsford, BC V3G 2M3.

2019 Production Statistics

The 2019 production year was slightly below average. When taking into account the extreme cold conditions early in the spring, followed by a strong dearth period in May-June, and poor weather conditions during the part of the summer, beekeepers still did remarkably well. Also, BC beekeepers did well compared to the prairie provinces where production levels were far below average.

The spreadsheet with detailed information by region and province is posted on the website, www.gov.bc.ca/apiculture. Some of the key differences between 2019 and 2018 are:

	2019	2018
Total Colonies BC	55,781	52,033
Total Honey Yield (kg)	1,773,993	1,542,417
Average Yield / Colony (kg)	32	30
Honey Wholesale	(\$3.38/kg) \$2,641,129	(\$4.86/kg) \$2,758,119
Honey Retail	(\$11.45/kg) \$8,398,791	(\$12.30/kg) \$10,561,805
Wax	(\$14.91/kg) \$469,660	(\$14.18/kg) \$316,760
Pollen	(\$21.79/kg) \$45,899	(\$22.42/kg) \$117,935
Queens BC Raised & Imported	25,607 - 38,807	46,892 - 33,128
Nucs & Pack's Produced / Imp.	16,307 - 6,901	36,302 - 10,005
Pollination Sets	66,396	33,839
Pollination Income	\$8,306,340	\$3,790,384
Total Income (Honey.wax.pollen)	\$19,861,819	\$17,545,002

Fumagillin for *Nosema* Control

Since 2018, Fumidil B (active ingredient; fumagillin) was no longer available in Canada for the control of *Nosema*. The withdrawal of the product from the market coincided with the closure of Medivet of High River who was the sole license holder in North America. Since then, the Canadian Honey Council has negotiated

with Medivet to acquire the license. This has resulted in the re-introduction of the product in Canada while another license has been issued to another party in the United States. In Canada, the product is now available under the trade name Fumagillin B, while the same product will be sold in the US as Fumidil B.

Since the product is only used in beekeeping and has no application in human health at this time, fumagillin has not been included under the Canadian veterinary prescription drug list (PDL). It will therefore be available 'over-the-counter' without the requirement of a veterinary prescription. The Alberta Beekeepers' Cooperative (Bee Maid) currently sells the product while local bee supply outlets are expected to market the product in the future.

Varroa Mite Management

The BC Ministry of Agriculture was involved in a comprehensive queen breeding program managed by Fran Calvert of Powell River in the late 70s - early 80s. The project also imported a few New Zealand queens which at that time was the only approved source of overseas stock. Around 1982, Dr. Denis Anderson of Australia requested a few queen specimens of the New Zealand parentage to determine the identity of any bee viruses that may be present. His study confirmed Kashmir Bee Virus (KBV) for the first time in North America. To us, the confirmation was nothing more than an academic curiosity because we had not observed any abnormalities in the bees. Later we learned that quite a number of viruses were associated with honey bees. Yet, the impact of viruses in the bee population was generally not viewed as an imminent threat because of the difficulty for viruses to gain access to the bee's body cavity. With the arrival of varroa, everything changed.

Varroa first arrived in the US in 1987 while BC confirmed its first sighting in 1990. Within a few years, it spread to most beekeeping areas of the province, except Vancouver Island where it was not detected until 1997. While mite control products including Apistan and Formic Acid became available at the time, I recall the recommendation from US researchers that no matter the mite control product used, the beekeeper should also "monitor, monitor, monitor".

From early on, it became apparent that there were complex population dynamics taking place between bees and mites. Mite levels would often show a gradual increase during the spring season until suddenly, the population would expand exponentially. To make matters worse, varroa proved to be an effective transmitter of bee viruses and with the rapid mite increase in summer, a commensurate level of viruses would be introduced into the bee population. The high population turnover of summer bees tended to obscure the presence of viruses. In fact, samples of summer bees collected from perfectly healthy colonies were often infected with different viruses. Studies have shown a positive correlation between mite levels and viral levels.

After honey has been taken off in late August, beekeepers often apply mite controls as standard management practice and some even check afterwards to make sure the treatment worked. Even though the mite levels may have dropped, the viruses remain in the bee population and it is likely that the all-important winter bees of September will become infected also.

Every fall, many beekeepers report that their bees have died for no apparent reason while plenty of food reserves remained. In most cases, mite levels were not monitored through the season except that the standard two mite treatments were applied in the spring and late summer. To reduce the incidence of colony losses in the fall, we recommend beekeepers to adopt a varroa management program where a mite test is carried out every 4-6 weeks, either by using the "Alcohol-Wash Method" or the "Icing-Sugar Shake Method" (please refer to www.gov.bc.ca/apiculture and select Bulletin #222). By recording the mite count of each test, one will get a clear picture of the population trend that is taking place. The data allows the beekeeper to manage mites and bees according to facts rather than guesses.

The question often pops up what to do with a larger number of colonies? Would all colonies need to be tested every 4-6 weeks? No, a random selection of a few test colonies can be made and used for the entire season. While these colonies will be managed the same as all other colonies, they will be tested every 4-6 weeks.

Varroa is an exceptionally virulent pest because of the impact its parasitism has on the bee population and the vectoring of pathogenic viruses. For that reason, the threshold for applying controls is low. Studies have shown that at just 3% infestation or higher, mite controls should be applied. Hence, the urgent need to monitor regularly.

Wasp Control

Beekeepers have been bitterly complaining about wasp predation in the last few years. In a previous BeesCene, I recommended the placement of wasp traps in May onward and entrance reducers in late July well before the wasps become a problem.

While attending the Apimondia conference, there was a neat little wasp control device shown at the trade show. It was a small plastic device, flat, about 2" wide, 1/4" high and about 5" long. This "low, tunnel-like" structure was open at both ends. The gadget would be installed with a standard entrance reducer.

When installed, the bees are forced to walk the full length of the tunnel for entering and exiting the hive. While bees don't seem to have any hesitation to walk through a tunnel, wasps apparently do. An alternative to the device may be a set of parallel plastic tubes that can be incorporated in the entrance reducer.

Happy Beekeeping in 2020! 🐝



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The Greater Wax Moth

Is It Becoming More Prevalent in BC?

by Heather Higo

The greater wax moth (*Galleria mellonella*) can be a scourge for beekeepers, infesting and destroying stored comb and also entering active colonies where the adult moth will lay eggs in out of the way corners. Upon hatching, the larvae proceed to feast upon comb, pollen and honey stores, and possibly even bee larvae, destroying the comb as they go and eventually growing to a length of 2.5 cm or more. They then chew their way into wooden frames or boxes, spin a cocoon, and begin pupation. Strong colonies are not affected as severely as small colonies are, or those with empty comb.



GWM larvae in cocoons prior to pupation.

Photo Heather Higo

The much smaller 'lesser' wax moth (*Achroia grisella*) is also a pest, but the damage it causes is much less severe. When I first began beekeeping over 30 years ago, it was a rare finding to come across greater wax moth (GWM) sightings in the field – my only previous experience with them had been in entomology labs where they are often reared for teaching purposes and also as food/egg laying substrates for other insects such as wasp parasitoids.

In my recent field experience, I have encountered GWM much more frequently than in the past – finding serious infestations in stacks of stored comb, as well as more frequent sightings of the larvae and pupae within colonies in active use. Most recently, I lost several boxes of comb to greater wax moth after they had been sorted, cleaned, and wrapped, awaiting irradiation. By the time they were irradiated the damage had been done and I was left with little comb intact, thick swaths of tough GWM silk embedded with frass (wax moth excrement) and dead wax moth larvae that had been irradiated.

In the "old days" beekeepers commonly used a form of moth balls – the chemical para-dichlorobenzene (PDB) – to prevent wax moth (both greater and lesser) infestation in their stored equipment. It was smelly, but the recommendation was just to air the comb out for a day before putting it back onto their colonies. Then in the early 1990's PDB was de-regulated



Greater wax moth damage.

Photo Heather Higo

because it turns out that PDB is a carcinogen, making it too risky (and illegal) to consider using again. Since then, the only GWM infestation control methods for stored comb have been either cold storage, irradiation, or the less effective newspaper layers between boxes. In 2018, I was given the opportunity to tour a bee operation in Ontario that is living with Small Hive Beetle (SHB). The beekeeper indicated that SHB is less of a problem than greater wax moth. He uses freezing as a management solution for both SHB and GWM – as soon as they start to extract, they freeze any comb that's not going back on the colonies at -18°C for 20-24 hours.

Currently, there is a proposal by the US EPA to register a non-toxic product to combat GWM. This is a strain of Bt (*Bacillus thuringiensis*) which is a natural bacterial component of soils in the environment, and is non-toxic to mammals and insects other than Lepidoptera (the moths and butterflies). Specifically, it is toxic to moth larvae when they ingest it because of their gut pH which is alkaline, unlike honey bees which have an acidic gut environment and would therefore not be harmed.

It is my hope that this product may also become available in Canada, but until then, be on the lookout for the ravenous and destructive greater wax moth! ❀

Bees in Burnaby

by Janice Bobic

The year 2019 marked the 10th anniversary of the updated Urban Beekeeping Bylaw in Burnaby.

For over a hundred years, Burnaby was a known agricultural area, from the Fraser River at the south to Burrard Inlet at the north. Fruits and vegetables have been grown here in abundance. Beekeepers had kept their honey bees and supplied honey to their neighbours and stores.

My dad, John Wuzinski, came to Burnaby in 1944 after getting married to Mom, Frances, in East Selkirk, Manitoba. They bought an acre of land that they found for sale at the foot of Burnaby Mountain, cleared the stumps left over from logging a hundred years before, and began planting gardens. After doing the planting, dad realized he needed some honey bees to pollinate all the strawberries and other fruits. He had started raising honey bees in 1935 at his father's farm in Manitoba, so made a trip back and packed up the hives and equipment to bring home to Burnaby.

With the abundance of fruit trees and berry bushes, the honey bees didn't have to travel far for their nectar and pollen. Every year dad harvested the honey; it was always a family affair that we enjoyed. He placed a sign at the end of our driveway on Hastings Street advertising the honey, fruits and berries for sale, and people came from miles around.

In 1966, city council passed a bylaw that prohibited cows, horses, pigs, sheep, chickens – and honey bees – from being raised on urban lands or home properties. The only declared agricultural area was down on the flats of south Burnaby along the Fraser River. This may be the reason that my dad shut down the hives and destroyed the bees – I am not sure as I was then a teenager and not paying attention.

In the following years, there were still some beekeepers keeping their bees in urban areas, but as long as they stayed under the radar and there were no complaints, the bylaw office didn't bother them.

Jumping ahead to 2004, after my mom and dad passed away, I was able to take over the family home. There my neighbour grew his garden and scarlet runner beans, saying he was getting lots of flowers but not many beans because there were no honey bees around anymore. The wheels started turning in my brain, and I found there was some bee equipment in the basement, so I decided I was going to raise honey bees. I took a beginner beekeeping course, and then brought home the bees to pollinate all the fruit trees and berry bushes in the garden. The neighbour's garden was benefiting from the honey bees too.

This was working well until the summer of 2008, when the neighbour got stung by something – probably a wasp. He came banging on my door and was livid, saying “Those bees are dangerous, you have to do something about them.” Then he went home and phoned the bylaw office to complain – after four years of peaceful coexistence. The bylaw officer phoned to tell me I had to get rid of the bees. I told her it is not so easy to move them in the middle of honey-making time in July, and that I would need 6 weeks. She said all right. I



Janice Bobic and her dad John Wuzinski with their bees at their Burnaby home in 1949.

then called the mayor's secretary to make a date to attend a council meeting, and the next available day was the middle of September. I then had six weeks to get my thoughts and words together to present to council in defence of keeping honey bees in Burnaby. I made a presentation with photos and text, requesting an update of the urban beekeeping bylaw in Burnaby. John Gibeau also attended with me; we had 10 minutes to present our case for the bees and to stress that it was for the greater good. The mayor and council decided in favour of our petition and passed it, forwarding it along to the Environmental Planning department for further studies.

The new urban beekeeping bylaw went through all the studies and public hearings, and nine months later, in the spring of 2009, it was official – honey bees were now legal again in Burnaby.

Since then, there has been an amazing growth of beekeeping in Burnaby. The Environmental Planners wrote up guidelines and created an excellent brochure that is available for everyone as a guide. 🐝



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Bee Research Update from UBC

by Mopelola Akinlaja

Foster Lab - Project Updates

It is common knowledge that honey bee colonies are typically inactive during the winter months in colder regions like BC. This makes it harder for research labs to carry out experiments requiring live bees during winter months. This winter we have been able to successfully house a nucleus colony at one of the UBC greenhouses. We even have the queen laying! This is exciting because of the potential for us to carry out year round research that involves the use of live bees, particularly newly emerged bees.

New Grant

Dr. Leonard Foster, alongside York University's Dr. Amro Zayed, recently obtained a \$10 million grant from Ontario Genomics and Genome Canada for a new BeeCSI project aimed at developing efficient diagnostic tools that can help improve honey bee health. It is no news that honey bee colonies have experienced significant health challenges that have resulted in recent significant declines; a lot of these declines have been attributed to colony loss through disease.

The BeeCSI project, which officially kicked off on October 1, 2019, plans to help build tools that can help us quickly and accurately identify disease in colonies through the collaborative efforts of Dr. Foster's and Dr. Zayed's labs. This project has many benefits to it. Scientists will be able to identify biomarkers (traits) that are linked to fitness or disease in bees and can provide further insight into breeding disease-resistant bees. The plan is for these tests to be possible while the bees are still alive. This will serve as a better alternative than the existing, costlier post-mortem analyses. Building these tools that help in identifying bee health stressors sooner is an important need in the field of apiculture. We hope to keep you updated on the progress of this work.



Mopelola Akinlaja



Image from <https://news.softpedia.com/news/Safe-Levels-of-Environmental-Pollution-Foster-Significant-Health-Issues-on-the-Long-Run-379465.shtml>

Article Summary: Using Honey Bees to Measure the Impact of Industrialization on the Environment

I wanted to highlight this paper that was published recently from work done at a lab in France. The work that they did was able to show how much environmental stressors and climate change agents are affecting bees, and how bees can be a good indicator for factors that are impacting the environment.

The experiments that were conducted in this lab observed how honey bees react to gamma irradiation as an indicator of the environmental impact of these kinds of radiation. Radioactive elements are one of the significant pollutants that negatively impact our environment. These radioactive materials can exist naturally or can be artificially introduced to the environment by human activity. The decay of these materials can release radiation such as gamma rays that are harmful to microorganisms, and effectively to larger organisms as well, like bees.

These scientists exposed some bees in the lab to gamma radiation at different concentrations and observed them over a period of 14 days, and compared to a control group of bees that were not exposed to radiation. While they did not observe any significant difference in the death rate between these two

groups, they did notice that some of the biomarkers they were observing changed across groups which indicates that these rays are in fact impacting the bee physiology in negative ways such as decreasing the effectiveness of their immune systems.

This paper was able to demonstrate that bees do respond to environmental pollutants and that thus we might be able to safely hypothesize that industrial pollutants that are negatively impacting the environment are also affecting pollinators like honey bees. ☀

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Science Review

Multigrain Bee Bread? Pollen Diversity, Quality, and Abundance in the Changing Beekeeping Landscape

by Alexandra Nastasa

A good diet is about more than just good food. Lasagna might be your favourite meal in the world, but after a week straight of eating it you'd start to feel a little sick. And few can survive on fibre bars and nutritional smoothies alone. Life is about sampling flavours, and human beings aren't the only animals who understand that a balanced breakfast means variety. Honey bees may pollinate the food that ends up on our table, but how often do we think about what we're feeding them?

The importance of pollen diversity in colony health has been the subject of discussion for decades now, with most feeling that higher diversity *must* be for the best, according to common sense. But the science is nowhere near so straightforward. Restricting bees' access to only particular types of pollen usually requires confining small groups of bees in the laboratory, and the disconnect between field studies of floral diversity and cage studies of bee survival is large enough that it can be hard to make the leap. Garance Di Pasquale is one of the researchers looking to build a bridge, although her studies remain primarily in the lab. In two consecutive papers, one published in 2013 and the other in 2016, she and her co-authors claimed that pollen diversity doesn't seem to be that big of a boost. Rather, it's quality and quantity that improve worker bees' survival and ability to feed their brood. But what is it about pollen that's so important in the first place?

While nectar is the primary source of nutrition for worker bees, pollen is what provides the hive with protein, lipids, vitamins, minerals, and sterols. Although some nectar has been found to contain low concentrations of amino acids, these are unlikely to contribute substantially to honey bee nutrition, meaning that pollen is the source of everything (besides sugar) that a colony needs to grow (Wright et al., 2018). Of course, not all nutrients can always be found in any one type of pollen, and some pollens contain more of the essential amino acids that bees cannot produce in their own bodies or more valuable sterols, making them ostensibly *healthier* pollens. Di Pasquale's research supports this theory (2013 and 2016).

In her 2013 paper, Di Pasquale and her colleagues compare the survival rates and development of nurse bees fed with pollen from four distinct superspecies/genuses of plants: *Rubus*, *Cistus*, *Erica*, and *Castanea*. *Rubus* pollen (blackberries, raspberries, etc.) had the highest quality by far, high in essential amino acids and with considerably more antioxidants. This increase in quality translated to an increase in survival rates in both healthy bees and those infected with *Nosema*, a common bee pathogen. It also led to more development of the nurse bees' hypopharyngeal glands, which they use to produce food such as royal jelly for larvae. When they mixed all four pollens together, the survival of the bees didn't improve. Healthy bees fed on this more diverse diet actually had shorter lives than those fed on just *Rubus* pollen, so it seems that pollen diversity doesn't matter as long as the pollen in question contains all the nutrients the honey bees need.

Further experiments in 2016 by Di Pasquale et al. confirmed that pollen quality is the key to a healthy honey bee diet. When fed with pollen mixes collected during different flowering seasons, honey bee survival once again correlated with availability of certain pollens and quality and not with diversity. The amount of oilseed rape pollen was found to be important for nurse development, and the

late July pollen mix in particular, (although not the lowest in pollen diversity), had an overwhelmingly large proportion of maize pollen and was the worst for bee survival by far because maize pollen is low in essential amino acids. The experiment found that even pesticide content didn't have a noticeable effect on bee survival. The most important factor of all appeared to be simply the quantity of pollen available to the bees: "The more pollen the honey bees received, the longer they lived."

Of course, in an agricultural beekeeping setting, pollen quantity and pollen diversity are not completely disjointed things. A blueberry crop itself provides very small quantities of low quality pollen, while an almond crop provides lots of pollen, leading to an overall lower pollen diversity (Colwell et al., 2016; Topitzhofer et al., 2019). The pollen from an apple crop is collected in large quantities by honey bees and is high in nutritional value, while cranberry is not as plentiful despite being of a similar quality (Colwell et al., 2016). And wildflower (fallow) sites in one field experiment did not provide pollen with high nutritional content, despite their higher pollen diversity (Colwell et al., 2016). So is it time to stop planting clover patches and bee gardens?

Pollen diversity on its own does not appear to affect the quality of bee nutrition or the likelihood of a healthy colony, but the availability of good food sources and the "bee friendliness" of the landscape does (Barroso-Arévalo et al., 2019). And although one type of pollen may be able to provide all the amino acids a hive needs, there are other important compounds that are a little more plant-species-specific. The fat content of royal jelly depends completely on the floral resources available to nurse bees, and all sterols the honey bees need must come from plants too (Wright et al., 2018). Phytochemicals such as caffeine and p-coumaric acid have been found to improve longevity and pathogen resistance in honey bees in certain concentrations, and these phytochemicals are unique to certain flowers (Bernklau et al., 2019). The importance of pollen diversity to the survival of honey bee colonies out in the field is still to be determined, and ensuring access to a variety of pollen resources in case some are difficult to harvest or deficient in particular nutrients is the key to a well-fed hive. If the resources are available, bees will actually bias



Alexandra Nastasa

their foraging sources to things the colony is depleted in nutritionally (Wright et al., 2018).

When a colony cannot adjust to a nutritional deficiency by themselves, there is always beekeeper intervention. Pollen patties and other protein supplements can help drag a hive out of starvation and make up for low pollen yield from their surroundings. However, on average, bees digest 75% of pollen they eat but only 25% of pollen substitutes such as soy protein (Wright et al., 2018), and it's not clear that these supplements can provide the range of additional nutrients that honey bees need. True substitutes for pollen do not exist (Wright et al., 2018). With this in mind, we can recognize the importance of providing more nourishing surroundings for both domesticated honey bees and the wild bees of the world, regardless of the direct effect of pollen diversity. By providing them with a feast to choose from, we ensure they can adjust their diets as they need to and continue to provide us with the variety of crops that add spice to our lives. ☼

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Ask the Buzzers...

As the saying goes, if you ask three beekeepers a question you'll get four different answers, so advice should always be carefully considered, especially in terms of location. Always consult experienced, successful beekeepers in your area.

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



In this edition of the buzzers, we asked a few of the AGM speakers from last fall to participate - thank you for taking part!

Q: Should I let my bees raise their own queens?

A: Unless you have good knowledge and control of the drone breeding population and weather it's a gamble. Most of us don't. It's best to buy from a reputable breeder or raise the queens yourself. Here is a good presentation by Randy Oliver of Scientific Beekeeping on raising queens for the sideline beekeeper: <http://scientificbeekeeping.com/queens-for-pennies/>.
~ Bruce Little, Vancouver

A: Not the right question. If bees are wanting to raise their own queen you should ask 'why, and is now the right time?' Is the old queen failing, is the hive overcrowded, are drones available for mating, etc.
~ Mike Campbell, Abbotsford

A: This happens to a large number of inexperienced hobby beekeepers, often without them realizing it. For example, supersedure when the queen is failing or there is an emergency queen replacement needed, and of course swarms, are all evidence of a colony raising their own queen. A beekeeper can intentionally raise their own queens through splits. It's a great way to increase your stock, and it is always better if you're doing this with stock that is gentle, hygienic, and has a good overwinter history.
~ Barry Clark, Prince George

A: Yes, if you don't want a honey crop this year.
~ Joe Lomond, Savona

A: Some colonies surely supersede their queens without us knowing it. Hopefully, our queens reared from selected breeders are better than the run of the mill.
~ Steve Clifford, Sunshine Coast



A: Like so many things about bees this is a yes and no answer. First off, honey bees are on a fast train when it comes to evolution. So when it comes to climate, your bees will evolve to local conditions, so yes raise your own queens and at the same time have spare queens on reserve for any problems that may develop during the active season. They are basically free. On the other hand some strains will not evolve successfully and due to the fact that you need to be totally isolated to suppress mating along absolute strains, and a queen may carry the lines of many drones, it does not sabotage the evolution to introduce some new genetics occasionally.
~ Eric Anderson, Quick

A: Your bees are definitely experts in raising queens, and will do the best job they can with what they have. Here are just several other questions to ask yourself:

Do you like the bees' performance and temperament?
Is the colony well populated and healthy?
Is there abundant forage (or should you be supplementing feed?) and warm summer temperatures?
Are there abundant drones in your area for the new queens to mate with?
Are these swarm cells, and by propagating them would you be promoting 'swarmy' genetics?
At the right time of year allowing a colony to re-queen itself can provide a valuable brood break which disrupts the varroa reproductive cycle, and a young well-mated queen can really re-invigorate the colony. However, if conditions and timing are not optimal you may impact the colony's honey production, winter performance/survival, and so on. Speak to queen rearers in your local club to determine the best timing for your area.

~ Darwyn Moffatt-Mallett & Michalina Hunter, Errington

A: I think so - it is great fun and a wonderful way (as a hobbyist) to have your own queens on hand. Lots of choices on how to do it as long as one bears in mind the foundation for successful rearing and mating of a good queen - a robust population of bees who need/want a queen and can care for the larvae and the newly emerged virgin with plenty of bee bread and honey. It is very handy to have a local queen in your possession given the cost, availability and variable condition of bought queens. I used to make up a few nucs and use them for their queens if I needed, or else grow them to nice colonies. In a nuc I have used a frame with eggs and bees, and have also used both supercedure and swarm cells that I cut out and carefully placed on the face of a brood frame. Remember that the virgins need drones for proper mating so as with most things in life - timing is all.

~ Julia Common, Delta

A: Well technically bees are always raising their own queens it's just the method you are using to start them that varies. I will assume what is meant by the question is: should I graft and use a cell builder as opposed to just letting nature take its course or, should I buy queens? If you are a hobbyist that is still new to beekeeping then buying queens from a reputable breeder that is close to your area and climate is a good option. I don't recommend buying queens from far away places like Hawaii or Chile.

If you are a small hobbyist that has been keeping bees for a number of years then I would recommend raising your own queens. I wouldn't recommend just letting the bees go about however they want to raise a queen whenever. With a booming hive you may end up with a swarm and loose bees. With a failing queen or poor performing hive you may not be getting the best material to start with; you want to start with good genetics – a hive that has survived winter, is a good honey producer, gentle, or whatever qualities you find desirable. Then I would research the different ways to produce queens. You don't need to graft, there are many other ways of raising queens. Seek out another hobbyist who has done small scale queen raising and can help you. Real live experience from another beekeeper is always preferred to videos and books.

~ Phil Brienesse, Smithers

A: You can let the bees raise their own queens, but the results may be 'hit and miss'. Success will depend on the genetic variation of the drone population at large. Having neighbours with different stocks will improve your chances of avoiding inbreeding.

~ Steve Mitchell, Duncan

A: It depends on what your objectives are. Some folks will tell you swarm queens are the best as they are raised by the bees in an ideal manner, at an ideal time. Others will tell you by using swarm queens you are just promoting swarmy genetics. Some will tell you there is nothing wrong with emergency queens, so to raise a new queen, just remove the old one and let the bees figure it out. Others will tell you that bees often use larvae that is on the old side to raise an emergency queen, which results in an inferior queen and a colony that's been without fresh brood for 3 weeks will be a weak colony when it comes to producing honey. Others will tell you that correctly timed queen removal results in a larger honey crop because the workforce has no brood to tend. Some folks will tell you that letting bees raise their own queens will result in 'locally adapted' stock. Others will point out, genetic adaptations happen over centuries, not in a year or two. The reality is, depending on your objectives, there is no right or wrong answer, only the answer that works for you.

~ Gerry Rozema, Campbell River

A: There are good reasons to let colonies raise their own queens as opposed to not letting them. Having bees that have

adapted to the local conditions of your area would be one reason. That said working with small numbers of colonies, it takes a village being on the same page to accomplish a local eco-type bee. Cost of purchased queens would be another as prices continue to rise, home grown queens in comparison are pennies to dollars with the colonies doing the work. Every beekeeper really should practice queen rearing even if it is in its most simple form as it is an important aspect of being a complete keeper of bees.

~ Garret Wilkinson, Nanaimo

A: That depends. Do you either have enough hives or enough bee neighbours that there is a diverse pool of drones? Is it swarming season or a good nutrition flow so that those queens and drones will be well fed? How early in the season is it? (Letting a hive raise its own queen in the later summer coming into fall doesn't give them enough time to build up their population again after the queenless period.) What is the stock or how well adapted to the local climate is it? In most cases, I would think that letting the hives raise their own queens would be preferable to foreign queens because they are more likely to be adapted to and adapting to the local climate. However, if you can, I would advocate raising extra queens from your best hives in nucs so that you have extra queens available when you need them. That way you don't risk losing a whole hive from queenlessness and you are selecting from the best stock that you have. Hives only successfully requeen themselves about 50% of the time so it's a huge risk to just let the hives requeen themselves. Finding a good local supplier is also a good option.

~ Karen Pedersen, Saskatchewan

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A: No and Yes. I do not like to allow my hive to requeen with emergency cells for the main reason that bees make poor choices when in a panicked state. As long as they choose the right aged larvae and it fully develops as a viable queen it's fine, but typically when a hive is in an emergency state, they will choose a larva that might be a little too old, it will naturally be the first to emerge and it will kill off all the right aged larvae in the hive to ultimately rule. That said, without that emergency behaviour, we would have a lot of hopelessly queenless hives within our operations so the function can work well. I just like to control more of those conditions as we develop out our queens. And yes, I have my own hives develop out their queens with queen cells that I provide them.

~ Ian Steppler, Manitoba

Q: Is organic sugar bad for bees?

A: Most organic sugars regardless of origin, are also non-refined. Non-refined sugars contain plant residues and particulate matter that bees can't digest. For winter feed, the non-digestible particulates will increase the incidence of dysentery and perhaps facilitate the onset of *Nosema*. For the health and well-being of the bees, refined sugar is recommended.

~ Paul van Westendorp, Delta

A: Typically focused on winter feed, the only way a sugar will be bad for the bees is if it holds a lot of impurities in with the sugar source or the sugar has degraded due to fermentation or overheating. If the bees are actively flying while fed a poor sugar source they can handle it better than when confined during winter.

~ Ian Steppler



A: When sugar is completely refined it must be, by regulation, 99.8% or more pure sucrose. Anything left in the 0.2% or less will most likely be some molasses residue that did not get completely removed in the purification process. So once sugar is refined to that purity, it does not matter where it came from, be it cane, sugar beets, organic or not. Additionally, since this feed is used for the bees often in the winter, the more pure the sugar, the less indigestible material that will be left in the bee intestine, which is a good thing when the bees cannot leave the hive on a cleaning flight.

~ Axel Krause, Castlegar

A: Normally I would say that organically produced food is a better choice than food treated with chemicals during its

production. However when it comes to choosing sugar for supplementary feeding of bees, the opposite is true. The more refined the sugar the better. Refined white sugar has been washed, boiled and recrystallized to remove the molasses. The end result is 99.85% sucrose with an ash content of 0.03%. Ash is the residue left after combustion of sugar crystals and is an indication of the mineral content. Honey bees can tolerate a very low level of minerals. Organic sugar on the other hand has been minimally processed and it retains more minerals. It is 99.5% sucrose with an ash content seven times that of refined sugar at 0.20%. This can be harmful to the bee's digestive system, causing diarrhea and potentially killing the bee. Darker coloured sugars including organic, raw, brown, golden and molasses should not be fed to honey bees at all. Apart from the risk to the bee's health, the extra cost of organic sugar makes it a poor choice for supplementary bee feed. A summary of bee feeds can be found on the website Urban Bee Network at <http://urbanbeetwork.ca/index.php/beginning-bees/feed-for-bees>.

~ Heather Clay, Vernon

Q: In late winter/early spring, is it a good idea to give your bees a pollen patty/protein supplement if there's a good chance of really cold weather still coming?

A: I've not kept bees in really cold climates (-20 or colder) and have not experienced an issue with this. The danger may be that the bees will leave the cluster to feed and freeze but the majority seem to retreat to the cluster.

~ Bruce Little

A: I feed pollen patties or bee pollen from the previous season on top of newspaper, when opening strong colonies, normally in early April.

~ Peter Christie, Dawson Creek

A: You never want to encourage them to break their cluster if cold weather is coming.

~ Mike Campbell

A: I would advise not to. Pollen patties will generate brood rearing, and the winter bees will start into a shortened life cycle. The brood nest temperature is raised, and as the queen lays larger patterns of eggs, the bees will try to keep the brood at the optimal temperature for their survival. Typically a late winter/early spring colony may be reduced in numbers, and the bees can die trying to keep the brood cycle going.

~ Barry Clark

A: In general, no. We do our best to avoid helping the bees to establish spring brood when we know the threat of deep cold still lingers. The colony will not abandon any brood that they start, and if they're stretching to raise as much brood as they can because we provided abundant protein, they will likely not be able to cluster back up tight enough if it gets cold again, and we can lose the whole colony. Usually best to consult trusted members of your local bee club for information on timing with supplementary feed in your area.

~ Darwyn & Michalina

A: This depends on how pushed the beekeeper is for pollination contracts and how much risk you are willing to take. The bees cluster to stay warm and the brood needs to have constant heat for proper development. The larvae also need proper nutrition so, if you start feeding early make sure you keep going and that the bees are insulated is what I would suggest. Remember that in spring rain the bees can't get out to forage, so if they have low stores and many brood to tend – that is stressful and there will be consequences. And bear in mind that if you start



early with supplementing – ie. stimulating them, you will also have the mites along for the ride so keep an eye on their populations.

~ Julia Common

A: Tough question. For me it really depends on how cold and for how long. The size of the spring cluster also plays a factor. In the spring your overwintered bees are living on borrowed time. Once they start expending the energy of raising brood they really speed up the clock on that borrowed time. The worst case scenario is a hive that builds up too fast with more brood than they can keep warm in a sudden temperature drop. The brood becomes chilled and fails and the remaining winter bees have spent their energy.

Generally the hive will limit brood rearing to available resources. Resources are of course number of bees to both feed and warm the brood, carbohydrate (nectar, honey, sugar), protein (pollen or substitute). So if I know a really cold snap is coming up I will limit additional resources so they don't raise more brood than they can keep warm. That said bees do an amazing job of regulating hive temperature. If there is enough bees in the cluster come spring it is always great to get a jump on brood rearing.

~ Phil Brienesse

A: Supplementing with protein will stimulate egg laying so you will need to continue with supplements until natural protein is available. With increased egg laying the colony will need to be strong enough to keep brood warm if cold weather is coming. Also be aware of early swarming with the faster build up caused by protein supplements.

~ Frank Blom, Kamloops

A: No. We try not to stimulate our hives before winter is actually over. They raise brood as a response to stimulation. Then they try and keep that brood warm even during cold spells. They will use up the nearby stores, but not leave the brood. They can starve with feed only centimeters away. Instead, we totally (entrances and all) cover them with snow to protect them from the winter, the warm spells and from us. We then have to remove that snow before we can get in there to mess with them. It prevents us from stimulating them too early.

~ Karen Pedersen

A: Depends on what is to be achieved. In my part of the country if we feed supplement too early, we merely stress

them out, unless they get access to flight right away. In spring, if the hives have been brooding already and you see cold shitty weather on the way, give them supplement and give them syrup. It will help the hives endure a prolonged period without forage and it will keep the hive out of a protein stressed situation. If they have plenty of pollen and honey stores on hand, there will be no problem. If they are more or less booming with growth and using the incoming forage hand to mouth...focus on supplemental feeding to help sustain that growth.

~ Ian Stepler

A: When hives have sufficient stores in the fall, there is no need to stimulate them into early brood rearing which may be wiped out by bad weather later in the spring or dealing with swarms. They are cold blooded and will raise brood according to the weather. Better to leave them alone unless for some reason there are not enough stores, then you have no choice but to feed them. Also, if one intends to raise early nucs and splits, stimulate them, and take the chance.

~ Rick Plantinga, Kelowna

A: In early spring bees will start brooding as soon as the first natural pollen becomes available, which can be as early as 4th week in January here on the island when we see tassles on the hazelnuts starting. Once the bees start brooding, they need a continuous supply of protein or they will start to cannibalize developing larvae when there isn't enough protein to finish feeding that larvae. We put on supplements to make sure our bees do not run out of protein for feeding larvae through the spring when we get a stretch of weather that doesn't allow for the bees to fly for a week or more.

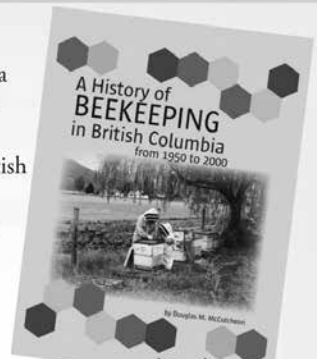
~ Gerry Rozema

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Any proceeds realized by the sale of this book above and beyond retrieving the cost of production are kindly directed by the author to the Boone Hodgson Wilkinson Trust Fund for Honey Bee Education and Research.

Q: How do you know if you should feed sugar syrup in the early spring vs. dry sugar?

A: I've found that below 12 celsius the bees won't take a liquid feed as it requires too much energy to dehydrate and process. Though I have not tried this I have heard of beekeepers placing a plastic baggy above the cluster below 12 celsius with the heat of the cluster warming the liquid to an acceptable temperature.

~ Bruce Little

A: Feeding depends on the temperature. If there are not enough bees or if it is too cold they will not touch syrup. You could give them a small amount of syrup and see if they take it down.

~ Mike Campbell

A: I feed fondant or dry sugar once the temperature goes below 5°C. That said, there are many beekeepers in my area (Prince George) who feed sugar syrup all winter long.

~ Barry Clark

A: Dry works fine in humid conditions but I think syrup is easier for the bees.

~ Steve Clifford



A: I've never fed dry sugar as it takes a source of water to liquidify it and from what I've read the bees are reluctant to do it.

~ Eric Anderson

A: A general guideline we've always used is: above 10°C we feed syrup as needed, and below 10°C the syrup can be harder for the bees to take and to evaporate; in lots of cases they simply won't take it. In the spring we tend to leave the dry sugar or fondant on as long as we can be bothered to keep it there, in case of a 'false spring' or 'second winter' it's already right where they might need it. If they don't, well no harm done.

~ Darwyn & Michalina

A: I am in the Fraser Valley. In February as I check the bees: full colonies who are eating their sugar cakes get another cake; full colonies who are struggling get a fondant patty, and same for the nucs. All my feeding is done without disturbing the cluster, it is done from the top with no lifting of inner cover. I start to feed syrup when things warm up (15°C or so) and the bees are relaxed and moving on all the frames, and also when there are no huge fluctuations between day and night temps. That is usually in March and I do not completely fill the feeder if I am worried about cold nights. I place the feeder close to the bees and keep the boxes insulated, and I feed warm syrup

if I can. In all these decisions I am assessing population, size of the brood area, colony behaviour and weather.

~ Julia Common

A: Dry sugar is an emergency measure for hives that are running out of resource in the winter. Sugar syrup is either to bulk up a hive's resources in the fall before winter or to stimulate brood rearing in the spring. For fall we use 2:1 syrup and in the spring 1:1 syrup. One thing to be careful of in early spring syrup feeding is the method you are using to feed. Large swings between nighttime and daytime temperatures can cause pressure changes in jar feeders that cause the jars to leak on the hive. Wet bees in cool temps is not what you want. The extra syrup on bottom boards also attracts ants, etc. Pail feeders tend to leak a little less as there is some give in the plastic. Frame feeders or other hive top feeders are also options.

~ Phil Brienesse

A: We don't ever feed dry sugar in our climate. We feed syrup in the fall until they won't take any more, and then we don't feed them again until it is time to stimulate them in the spring. Stimulation is done with syrup because it mimics nectar.

~ Karen Pedersen

A: Maybe dry sugar will help with emergency feeding if humidity is plaguing the hive. Syrup seems easiest to me.

~ Ian Stepler

A: When hives do not have sufficient stores in the spring, they must be fed, or they will starve or at the least have brood rearing reduced. Feeding 2:1 sugar syrup is one way but may have side effects as the bees will have the added task of drying it down. They do not need more moisture this time of the year. Early feeding will also stimulate early brood rearing which may backfire later if a cold weather spell wipes out brood and/or having to catch swarms later. Dry sugar is less of a stimulant as bees make use of the abundant moisture in the hive. Ensuring they have plenty of stores in September helps prevent this problem.

~ Rick Plantinga

A: Ambient temperature and strength of colony (number of frames covered with bees) are important considerations deciding syrup or dry sugar. Also, method of feeding syrup is a consideration as frame feeders are not effective for small clusters as bees will not move far from brood which needs a temperature of 30°C. Overhead feeders such as Ziploc baggies with a slit cutting atop for access seem to enable bees to quickly take down warm syrup to nurse bees and brood.

~ Gerry McKee, Burnaby



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Bee BC Projects

Mass Banking of Mated Queens Through the Winter

In 2019, our breeding co-operative (Heather Higo, Bradford Vinson, Michalina Hunter, Darwyn Moffatt-Mallett, Nancy Leonard, and Ian Kennard) received a Bee BC grant to help fund a project to establish a procedure to bank queens over the winter. Adoption of these queen overwintering techniques and incorporating them into normal management by queen breeders should help to alleviate the shortage of local queens in British Columbia in early spring – the time of year when local queens are in greatest demand. We bred queens from the Hygienic Behaviour-tested Marker Selection Project (MSP) stock that was developed over the past five years while working with UBC's proteomics lab run by Dr. Leonard Foster. We were able to bank a total of 165 mated queens spread around the lower Fraser Valley and Howe Sound area.

Successful storage of mated queens through the winter from mid-September through to March can be achieved by following a few simple procedures: (a) preparing large two-queen bank colonies starting in July; (b) in mid-September, removing and caging mated queens without attendant workers from small colonies that would likely not make it through the winter months and the two queens from each bank colony; (c) feeding the bank colonies enough so that they get through the winter; and (d) insulating the bank colonies to reduce worker clustering during the winter months. This methodology is based on the work of Margriet Wyborn et al.¹

A: The preparation of two-queen colonies to use as banks should be started by the beginning of July, and they will remain queenright until 24 hours before the introduction of caged mated queens for banking by mid-September. This provides the benefit of two queens producing lots of brood and a surplus of adult workers and should also aid the bank colony workers in adapting to multiple mated queen pheromones. This helps in reducing any aggressive behaviour by the workers in the bank colonies towards the introduced caged mated queens. The two-queen system can be any design made up to suit your needs. Our group used stacked chambers with queen excluders between the upper and lower queens to keep the queens separated. Management of the two-queen banks follows normal beekeeping practice: regular inspections for mites, early mite treatments, checks to see that both queens are still alive during the summer, and that the colonies are building evenly. It is good practice to rearrange the chambers as necessary so that both have open and capped brood and adequate space for the queen to lay. Sometimes the lower chamber loses workers to the upper chamber, so to help even out the population, capped brood frames from other healthy colonies can be added to help ensure that the bank colonies have sufficient populations by mid-September.

It is also important to ensure that there is enough food to keep queens producing brood. Feeding pollen patties and sugar syrup (1:1 water to sugar) will ensure that the queens will produce brood during any dearth summer periods and that the colonies have lots of winter bees. I made sure they felt

they had a nectar flow going so as to produce as much brood as possible, especially during August when the winter bees are being raised. I do believe fat winter bees are what gets you through the cold. You can use bees from any of the colonies that you removed the queens from to boost the population of the bank colonies in September as well.

We used extra chambers to install frames of bees from smaller colonies to boost the population of the bank hive, with sheets of newspaper sprayed down with syrup between the boxes to slow the mixing and help to blend the newly introduced bees; this helps keep the caged queen safe from any aggressive worker behaviour. The bank colonies need to settle down before you introduce the bank frame with all your mated caged queens. The bank frame with caged mated queens can sit below the added supers in the original two-queen colony while the workers from the multiple small colonies blend together. In our project, the added colonies' bees are also sprayed with syrup as the worker bees are introduced to the upper chambers of the bank colony to aid in the blending of the colonies. The worker bees at this time of year are very accepting once they have lost their queen, but spraying syrup lets the workers groom each other so acceptance of each other



Installing bank frame into colony while colony is blended.

occurs in a short time frame, usually within 24 hours. Left alone for 48 to 72 hours, the beekeeper can remove the excess newspaper and any frames from the extra colonies that the bees do not need.

The bank colonies were reduced down to two chambers full of food for the winter, and the bank frame was positioned in the centre of the upper chamber.

B: The two queens from the bank colonies were caged and kept in the original two-queen bank population with the queen excluder removed, along with an additional 13 queens

(15 total per bank). The queens can be sandwiched between frames so that workers can feed them through the bee proof screens on the cages. We used wooden California cages to prevent worker bee access to the securely caged queens other than for feeding purposes.



Placing caged queens into bank frame.

Plastic JZBZ cages have too large a gap between the lattice work of the cages which could possibly allow aggressive workers to damage the mated queens, and queens to possibly contact each other with deadly results. The cages were placed in the holding frame, which needs a tray system or an area cut out of the foundation to house the block of queen cages, with 15.5 cm of pulled comb (preferably honey-filled) on each side of the block of cages. This allows the bees to cluster around the queens during cold weather. Less than 15.5 cm of pulled comb to either side of the cage block can cause chilling and queen mortality on the outer edges of the block.



A new bank frame with tray system is ready for bees to pull comb in spring and summer.

The block of cages can be held together with duct tape around the edges, leaving the bee proof screen facing the workers. We marked the lineage and mating information of each queen on her cage.

C: Normal management techniques for wintering include early provisioning in the form of sugar syrup to ensure enough food supplies, and insulating the colony banks. We used sugar syrup until the weather became too cold for the bees to fly, then we used alternate methods of dry sugar provisioning - some used sugar cake as an emergency food supply and others used dry sugar.

D: For insulation, we purchased Beaver Plastics' Langstroth expanded polystyrene (EPS) brood boxes. They have an R value of 7.5 (EPS has an R value of 4.0 to 5.0 per inch of thickness), are lightweight and do not require winter wrapping in our area. In past years, we have used rigid foam insulation, building a sleeve to surround the wooden brood boxes, and insulated winter wraps. This is the first year we have used the polystyrene brood boxes and so far I at least am impressed with how much bee activity I see outside of the hive when temperatures rise above 10°C. Insulation of the queen bank colonies to preserve heat and reduce winter clustering is of paramount importance; the insulation allows for looser clustering and better thermal control within the hive chamber.



Bank ready to be closed up for the winter.

I have a small operation and not much land to build winter shelters for my hives. The two banks that I set up saved me from having to construct protection for the twenty three extra hives that were too small to get through the winter. Banking is a viable option for breeders as long as you start early enough in the year and build healthy banks.

In the spring of 2020, we will use the surviving overwintered banked queens for early season splits and for populating mating colonies well in advance of the queen rearing season. Consideration of weather and availability of forage will necessitate when early splits can be produced. Mid to late April is when we anticipate removing the queens from the overwintered bank colony and installing them into nucleus colonies or mini mating nucs which are made queenless 24 hours before queen introduction.

Normal spring feeding regimens need to continue to ensure the survival of these small colonies. Nucleus colonies should be insulated to help with thermal regulation. It may take banked queens a little longer to begin laying (some as long as two weeks) although some queens begin laying right away.

Research done by M.H. Wyborn, in her thesis “Mass Storage of Honey Bee Queens During the Winter” (1991)², indicates that overwintered banked queens show no significant difference in performance from colonies headed by queens in overwintered nucleus colonies. Adoption of these queen overwintering techniques and incorporating them into normal management by queen breeders should help to alleviate the shortage of local queens in British Columbia in early spring – the time of year when local queens are in greatest demand.

I would like to acknowledge the financial contribution to this project by the Province of British Columbia under the BC Bee Program and the support of Leonard Foster’s lab in the Department of Molecular Biology and Biochemistry at UBC.

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The Bee Awareness Society School Education Program

- Sharon Myers, Henry Hutter, Keith Stetsko, Pete Relkoff and Linda Martin

The Bee Awareness Society in the West Kootenays works to educate children and community members about the role pollinators play in the environment and in food production. Their goal is to teach good stewardship so that a healthy environment can be created. The Society also offers a “live learning tool” to local schools in the West Kootenays. Using observation beehives, the Society teaches students about the vital role that honey bees and other pollinators play, as well as the pests and diseases that cause them stress. “There are fewer honey bees, bee species and other pollinators available for pollination,” project coordinator Linda Martin explains. “We knew we needed to expand our education and outreach efforts.”

With funding through the Bee BC Program to conduct their Bee Awareness School Education project, the Society teamed up with the Mount Sentinel Secondary Woodworking Shop to



Linda Martin and Keith Stetsko with Mount Sentinel Secondary School woodworking students who helped build the new observation hives.

build ten glass observation beehives which will now be used to provide the learning module at new schools.

According to Linda, she could not have asked for more willing volunteers. “Our project was very successful, the students of Mount Sentinel woodworking shop were very knowledgeable, eager and hard working to complete the construction and finishing of the beehives,” she reports.



Planting seeds for pollinators.

To date the Society has educated approximately 2,000 children about the plight of honey bees and other pollinators, including what children and their families can do in their own backyards and community to mitigate the risks posed towards pollinators. They teach kids about honey bee biology and life cycle as well as a host of other BC pollinators and how to support them, through planting flower gardens and reducing or eliminating the use of pesticides. While there tends to be tremendous enthusiasm and support within the community, Linda is grateful that provincial funding has allowed them to enhance their outreach efforts. “Initiatives like the Bee BC Program are instrumental for helping us co-create a healthy and sustainable environment for bees, other pollinators and mankind,” she says.



Teaching honey bee facts, with an observation hive in the background.

Comparison of Nosema Treatments

- Michael Campbell and Dr. Cameron Lait

The aim of this project is to evaluate the effectiveness of various treatments for *Nosema* in honey bees. *Nosema* is a spore-producing fungus-like parasite which can have a significant impact on bee health. There is a 10,000 fold increase during its life cycle which is why the infections are so hard on the bees; it is a major concern for many beekeepers. It has been found that there is reduced digestive activity in young bees infected with *Nosema apis*¹ resulting in starvation even during a honey flow.

Over the years we had a successful treatment program for *Nosema*, treating twice in the fall with fumagillin. We waited until most of the summer bees had gone, wanting to treat just winter bees, and for many years didn't appear to have any trouble with *Nosema*, until one spring many hives were showing signs of it, some with very high spore counts.

As an aside, we participated in the National Health Survey and some bees which had been used in pollination of berries tested high for the presence of pesticides, and we wonder if there is a relationship between this situation and the high *Nosema* levels. The production of glucose oxidase, a natural enzyme bees use to sterilize colony and brood food, is significantly decreased in the presence of pesticides and *Nosema*.²

So due to the ineffectiveness of our usual treatment and the possibility of losing fumagillin altogether, we wanted to test other available treatments for *Nosema*.

Treatment Options

The treatment options we considered were:

Fumagillin, an antibiotic.

Nozevit, a 'natural herbal product' from Croatia made with bark extract, rich in plant polyphenols (likely tannins), essential oils, vitamins and citric acid. There are claims by various sources that it can effectively treat *Nosema*.

Honey B Healthy, a feeding stimulant made with spearmint and lemongrass essential oils. There are no claims on its efficacy against *Nosema*.

Experimental Design

Initial *Nosema* spore counts were done for colonies at three locations: Emma's Acres (Mission), Campbell's Gold apiary (Abbotsford) and Kwantlen Polytechnic University (Langley). Treatments were applied to bees by the drench



Collecting bee samples.

method, according to the directions for product use.

Dosage rates:

Fumagillin: 20mL (4tsp)/L 1:1 sugar syrup

Nozevit: 5mL (1tsp)/L 1:1 sugar syrup

Honey Bee Healthy: 5mL (1tsp)/L 1:1 sugar syrup

250 mL of solution was applied to each hive.

Colonies were divided into control and treatment groups so that high (1M+), moderate (500k up to 1M) and low (under 500k) spore counts were included in each treatment group.

Four treatments were done with for each of the treatment groups, in late September and early October, and final *Nosema* spore counts were done on October 14. To take samples, foraging bees were collected by vacuum directly into a vial containing ethanol.



Vacuum with vial containing ethanol.

Bee samples were crushed and homogenized in 25 ml of water. Spore counts were done with a compound microscope with 400X magnification.

Results



Homogenizing bee samples.

There were a wide variety of spore counts at the beginning of the trial, ranging from 50,000 spores to 5.5 million spores. In the control group, with no treatment for *Nosema*, overall there was a 56% overall winter survival rate. For the group treated with fumagillin, there was a 73% overall winter survival rate. For the group treated with Nozevit, there was an 88% overall

winter survival rate. For the group treated with Honey B Healthy (HBH), there was a 64% overall survival rate. Table 1 lists the winter survival in each treatment group, separated by the level of spores counted.

Spore Counts	Treatment			
	Fumagillin	Nozevit	HBH	Control
> 1 million	80	100	33	0
500,000 to 1 million	78	100	62	57
< 500,000	71	78	71	55

Table 1. Winter survival rate of hives by treatment and spore count, as percentages.

Discussion/Conclusion

From our data, there does not seem to be a strong correlation between increased spore counts and colony mortality going into winter. Fumagillin appears to be the only treatment to significantly control *Nosema* spore production in surviving colonies. We cannot predict how results will extend into the next season. However, we will continue to track spore counts and mortality of study colonies heading into spring buildup.

Further Study Required

Some issues which came up during this study which merit further study:

- the relationship between varroa and *Nosema*
- the relationship between pesticides and *Nosema*
- is there a base *Nosema cerenae* larval infection and if there is, is it important?
- is there natural resistance to *Nosema* and can we identify it and breed from it?
- at what speed does *Nosema cerenae* develop?

- are there easier and earlier detection methods?
- what is the relationship between spore counts and level of hive damage?
- variation of *N. cerenae* haplotypes?
- do yellowjackets vector *Nosema*? We did not find any evidence of *Nosema* in the guts of wasps sampled at any of the three study sites.

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funding provided by:



Evaluation of yellowjacket wasp control measures

- Michael Campbell in partnership with Kwantlen Polytechnic University, Emma's Acres, LINC Society and Bradford Vinson

This project involved first monitoring wasp populations from April onwards, determining when queens were no longer foraging, and then determining when the wasp population explodes and when they began to attack bees. The idea was to then determine which devices would be most effective in preventing colonies from being overwhelmed.

We considered several different types of entrance reducers, screened fronts which made the bees climb the front of the super before exiting, partially screened fronts which made the bees climb the front of the super before exiting, a device to divert the wasps to a trap and protective devices for nucs. Only the partially screened front which made the bees climb the front of the super before exiting showed real promise. Also, I am aware of several people who have had success with a trap only device, and we will be trying out several of them with the goal of determining whether to place them on the bottom or the top of hives.

We have been co-operating with the scientists at Intko Supply for several years in their development of a pheromone based lure to attract yellowjackets and wasps. They have developed a lure which is non-toxic and non-attractive to bees but very attractive to yellow jackets. They are always working to improve their existing lure and we continued to co-operate with them this year.

We set out traps in March at three sites and generally emptied, refilled and counted catches about every three weeks. At our home property this cycle was interrupted when the Intko scientists were doing their field studies; it was a bit of extra work but well worth it in the value that

was received from discussing results and ideas. We did find that at the beginning of the study that we were only catching queens. That was very gratifying because each queen caught then saved us from having to deal with between five and fifteen thousand yellowjackets attacking our hives later. The first workers in any number did not appear until June. I had expected the population to grow rapidly in August but it remained relatively low. At the beginning of August the scientists caught 2,500 and a week later I caught 1,378 but they were not yet attacking bees. By September 15th the number had risen to 20,031 with 8,126 attacking bees; a week later 24,563 were attacking bees, a week after that there were



September 15 - 20,031 wasps this catch. 8,126 caught directly attacking beehives. So that gives a pretty good idea what their dietary preference is for this time of year.

45,645 including 11,520 that were not directly attacking bees but who were in the neighbourhood.

All nucs were reduced to entrances of one bee space in mid-August, and all the full size hives were reduced to three bee spaces. The experimental bee trap was used as well as a number of devices that made the bees walk up the front of the hive behind a screen before they could exit. In addition, once bees were observed to be under attack, hives or nucs were reversed and traps were placed where the entrances used to be so that we could tell how many were attacking the hives.

We noticed that the behaviour of the yellowjackets changed about the time they began attacking the bees. They flew closer to the ground and then tried flying up into the hives. We tried alternative wasp catchers made with half inch holes in various plastic food containers which we set on the ground near the hives. We found that when the containers were translucent they were more effective. We also tried adding sugar to the lures and that seemed to have a limited effect and it also caught a few bees.



October 1 - So I thought the wasps were finally slowing down but I guess I was wrong. This week's catch 11,520 just generally in the neighbourhood and an additional 34,125 still directly attacking bees.

None of these strategies was effective enough to stop the wasps from marking and destroying the nucs as well as five two box hives which seemed like they should have been strong enough to withstand an attack. The wasp trap device was effective in catching the yellowjackets but not effective enough to stop the hive from being overwhelmed and destroyed. The screened fronts took the bees a couple of days to get used to and, in many but not all cases, the wasps got used to them as well. One variant I made to the screened front idea was to have a screen over most of the front of the hive but only a small area behind a solid cover that the bees could walk up, and that was more effective in that the yellowjackets did not figure out how to defeat it.

Certainly a lot of yellowjackets were taken out of the environment and that probably save a lot of bees. We gained insights into the placement of wasp traps and ideas for adaptations to entrance reducing devices that we will try this year. We also got a pretty good idea on when to deploy the devices before the problem appears. This project is ongoing and we will have more information to share once this season is over. 🐝

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BCHPA Membership Renewal Reminder

If you haven't yet renewed your membership for 2020, please do so before the semi-annual meeting in March to continue receiving the newsletters, and stay up to date on beekeeping news and information.

Visit www.bchoneyproducers.ca and click on Membership, or fill out and mail in the form on page 13.



Thank you for your support!

Save the Date!

Saturday, March 14, 2020,
is the Second Annual United Beekeepers
of Alberta AGM and Conference.
This year, it will be in Spruce Grove, Alberta,
a few minutes from Edmonton.

The one-day event includes a trade show, honey competition, and a great line-up of speakers. You will learn about organic certification, the real properties of honey, beekeeping technologies, research, and the practical side of beekeeping. Presenters include Jaime Aguilar, of Eco-Cert organic certification; Tracey Smith, who has interesting beekeeping technologies to share; Acting Provincial Apiculturist, Samantha Muirhead; commercial beekeeper Reece Chandler; Olivia de Herdt of the Alberta Ag bee team; Cassandra Docherty, apiculture technologist; large-scale side-liner Neil Bertram; and, *BeesCene* contributor Ron Miksha.

We hope you make it to the conference.
If you can't, we may be setting up livestreaming for this event, so be sure to check our website on the 14th of March!

Visit <https://unitedbeekeepers.org> for details.

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BCHPA Certified Instructor Committee Seeking New Member

The BCHPA Certified Instructor Committee is accepting applications for a third member to replace Lance Cuthill, who is retiring from the committee this year. The successful applicant will be working primarily with Ian Farber and Axel Krause and also with the current BCHPA president on the ongoing development and biannual presentation of the Certified Instructors course.

In their application, candidates should indicate the following:

1. Length of active and ongoing BCHPA membership
2. The year the applicant successfully completed the Certified Instructors Course
3. The number of Introductory Beekeeping courses they have taught as a BCHPA certified instructor
4. Their current number of beehives and the past number of years that they have kept bees including average number of colonies for these years
5. Any relevant formal teachers' training and/or experience working with students in a teacher/student or mentor/mentee relationship
6. Any other relevant information the applicant feels will support their application, which may or may not include names of references. As well applicants may also include a written summary of their reasons for wanting to be a part of the Certified Instructor program.

Upon receipt of applications, the Certified Instructor Committee will compile a short list of candidates who will be invited to an interview at the semi-annual general meeting in Kamloops, 27-28 March 2020.

Please email your application to: a.krause@telus.net by March 7, 2020.

In Tribute

Our Cariboo Chilcotin beekeeping tribe has lost a great member and friend. Thank you Otto Slavik for your years of enthusiasm. You readily volunteered at our club education booths to share your passion for honey bees, and we loved visiting your apiary for Field Days, you and Olga were always gracious hosts. The beautiful wooden observation hive that you crafted and donated for public events will be appreciated for years.

Born in Czechoslovakia, Otto passed away in Williams Lake at home after a long battle with cancer. His wife Olga and sons were by his side. Otto leaves his four children, Otto Jr, Robert (Tricia), Albert, and Olga (Scott) as well as nine grandchildren: Malcolm, Jacob, Isaac, Rachel, Elijah, Dana, Hannah, Matteo, and Judah. Otto is survived by his brother George in Slovakia.

Otto and Olga immigrated to Canada in 1968 and first settled in Prince George, and in 1991 they moved to Williams Lake. Otto worked as a Registered Professional Forester until he retired in 2003. He was a life-long naturalist, an avid beekeeper and a dedicated linguist.

Following in his father's footsteps as a beekeeper in Czechoslovakia, Otto passed on his beekeeping knowledge to his children and grandchildren. Honey extraction has become an annual family event.

In 2007, upon hearing of Dr. Eva Crane's passing, Otto shared with us that he met her at the Apimondia congress in Prague in 1963. He was there as a student with his father who was an admirer of Crane's research. Another favourite story from "the old country" was how during tough times, beekeepers made do. Otto recalled using a kitchen colander for a bee veil, a wonderful example of overcoming adversity.

Otto was also known for his various artistic abilities including woodworking, oil painting, sketching and playing the piano. He liked being at home best and

Otakar "Otto" Slavik

November 1, 1942 – January 24, 2020



enjoyed it when people visited for chats and a home-brew. Before succumbing to a debilitating stroke in 2015, Otto was very active, frequenting the local recreational center, the Catholic Church and Scout Island nature reserve.

Otto will be sadly missed. The Slavik family is planning a Celebration of Life memorial for July. 🍀

~ Diane Dunaway



Otto and two of his grandkids extracting honey.

Photo Rob Slavik



The hives in the background are Otto's set up for wintering, which he built from scrap wood he had put to use. These shelters allowed him to put insulation around the hives, a modification of the way his father and grandfather kept bees.

Photo Rob Slavik



Eileen McCutcheon

March 24, 1943 – December 3, 2019

Eileen McCutcheon, wife of Doug McCutcheon, died on Dec. 3, 2019. Doug is a former Provincial Apiculturist and author of *A History of Beekeeping in British Columbia* from 1950 to 2000. A Celebration of Life for Eileen was held on January 25, 2020. She was born Eileen Wilson in 1943, the oldest of 3 girls, and was brought up on a farm in South Langley. She worked on the farm with her dad, and delighted in driving the tractor while haying and working with the cows. She belonged to a choir at school and played the accordion, and she liked fashion and learned to sew and made clothes for herself. She had been stricken with polio as a child for which she required surgeries, and to her annoyance it left her unable to wear the high heeled shoes she longed for!

During her first marriage she resumed farm life and was in her element with huge vegetable gardens, corn fields, chickens and cows. She canned and preserved food as many farming people do. She had 2 children, a daughter and a son, and she eventually took up beekeeping as did her dad who lived nearby.

Beekeeping became a passion. She worked for F.W. Jones & Son Ltd. in Langley with Ted Hancock and the late Ray Salt. She seems to have immersed herself in beekeeping and won Langley Bee Club Trophies for her honey. She was still Eileen Rooney when she served as secretary of the Langley Bee Club. She is remembered as a tireless volunteer and the following is a recollection of her by Rick Kreisch:

Eileen was an integral part of the Langley Bee Club back in the late 80's and early 90's. As the club was being governed by a group of mainly men, who were great at providing beekeeping advice, this left it up to a couple of ladies (Eileen), to make sure the meeting didn't get too sterile and provided time for a coffee and some refreshing "non-manly" conversation.

During this time, the gentlemen decided that putting displays at fall fairs would be great for promoting the club, with the task of setting up the displays falling on Eileen's capable abilities. Eileen would spend many hours the evening before events preparing, and spent the following days manning the booths.

During these early days, the club had a few beehives which were moved to pollination, with honey extraction, bottling and the sale of the honey on the club's behalf being done, in part, by Eileen in her basement. Eileen was always the first in line to volunteer for any of the club's endeavours, from helping set up the club's 500 pound honey display



at the PNE to taking the observation hive to schools for a show and tell, which usually extended from one classroom to the entire school.

Eileen and I spent many hours together manning booths at the fairs, with conversations always turning to bees, and as I was just a beginner I listened with great fascination as she explained her calm and gentle approach to them. I think these early conversations have lasted with me in my daily approach to beekeeping.

In the early 1990s she met and married Doug McCutcheon. After a short period living in Brookwood, they moved to Armstrong and together they started a beekeeping business producing liquid and especially comb honey, other hive products, and nucs. They also began a sideline business of selling bee books and beekeeping supplies.

In the early 2000s they settled back in Langley where Eileen was closer to her grandchildren. She loved being a grandmother and had a close relationship while sharing cooking and sewing projects. It was then that Doug began in earnest his history book. It is not overstating it to say



Eileen and Doug at work on the history book.

that Eileen was his right hand person in this enormous undertaking. I recall visiting them more than once and each time she would be typing the manuscript and sourcing information. Later she also helped with editing, and Doug credits her for the attractive cover design with hexagons filled in by various pollen colours.

In closing I wish to acknowledge the help of her daughter Shannon Rooney in preparing this memory of Eileen.

~ John Boone



Barbara Lee Gent

February 15, 1959 - January 9, 2020

It is with broken hearts and a deep sadness we announce that Barb passed away peacefully in the arms of her family at the palliative ward in NRGH after a courageous and determined battle with cancer. Barb is survived by her husband and best friend Andrew, her sons Mike (Nadine) and Lorne (Heather) and the true blessings in her life - her grandchildren, Lorne Jr and Emmeline.

Barb was born the oldest of her 3 surviving siblings Ronald (Ron), Dawn and Dale. As a young girl she lived in Alberta, where many happy days were spent at her grandfather's farm discovering her love for horses that would last throughout her life. Barb started her adult life as a stay at home mom, raising her sons in Black Creek where she developed her passion of gardening. This led to her starting as a part-time clerk at Buckerfields in Courtenay where she advanced to become Store Manager in 1996.

She married Andrew in August 1997 and so Andrew, Barb, Mike and Lorne became a close and loving family -



continuing to this day. Barb was an amazing cook and truly enjoyed yet another of her passions - baking. She loved nothing more than providing family, friends and coworkers with a steady stream of delicious pies and tasty treats.

Barb was indeed a remarkable woman. As well as being a dedicated wife, mother, grandmother, sister and aunt she was also known as an inspiring mentor, a "bad-ass" businesswoman (she later became Buckerfields Store Manager in Parksville and part owner of the business in 2005) and a loving, dear friend to so many.

The Oceanside Hive lost a great friend last week. Barb Gent, friend to many, businesswoman, beekeeper and a wonderful human being. She gave it everything she had, losing her battle on January 9 with her soulmate and husband Andrew and two sons at her side. Barb helped found and was a creative influence behind the Oceanside Hive: A Beekeepers Collective in the fall of 2017. We are left to wonder why someone so beautiful and so young has been taken from us. Barb loved her family, especially the grandkids, her horses and honey bees. Ride far and ride fast, friend, on the wings of bees while we mourn your loss. There is a whole universe to explore. We love you Barb.

~ Don Fowler and all the beekeepers of the OH.



Barb and her husband Andrew. Photo Don Fowler



Heather Klassen and Barb Gent of the Oceanside Hive. Photo Don Fowler

For those who wish, donations may be made to Nanaimo Hospital Foundation (palliative care) or any charity of their choice in her name.

Canadian Honey Council



**Stan Reist,
Canadian
Honey Council Rep**

I am sitting in Sacramento at the AHPA meeting, it's warmer in Nanaimo than it is here, rain, fog, snow and only 3 degrees (old school in the Fahrenheit scale).

We have had a meeting with the executive of the AHPA and it appears that we both have the same but slightly different problems. They have issues with adulterated honey and have identified it but do not have the enforcement with which to remove it from the shelf. They

were also somewhat surprised that the CFIA is testing with NMR and actually removing product from the shelf with a destruction order. When asked about testing methods, we told them that we are using NMR and Peter Awram is working with Leonard Foster on Mass Spectrometry also, for testing – we are not just using one test to try and catch the problem, so it appears we are a little ahead of the US with a solution. There is a scenario that some honey was tagged on the west coast of the US and was to be destroyed, however it somehow ended up on the east coast, the destruction order was removed and it was being sold for \$300 a barrel. Whether this is an urban myth or not, I can't say for sure.

We have also had a meeting with a few representatives from the California queen breeders, located north of Sacramento. We voiced our concerns about the encroachment of the Africanization of the breeding stock. They were surprised that we didn't already have it. What they cited was the proximity of the US hives to our Canadian hives along the Canada/US border from the eastern provinces along to Quebec and Ontario and then to the prairies, and BC in the Fraser Valley. If you think about it, most of the hives on the US side are on the pollination circuit and they pollinate from all over the US, completely north to south and then all the way out west for almond pollination where they mis with everything, and then they disperse to start all over again. If there is a chance of getting something, they figure it's a far greater risk than where they make queens in their area.

They went on to say that they are working with their local and regional governments to keep the area clear of migrating hives. If the pollinators get caught in this area, they are subject to severe penalties as queen production is a huge source of revenue. They have extra funding to police this area and they also write some substantial cheques to help in policing, so as an industry, they support enforcement.

The CHC has been asked to write a letter to the Organics Certification board to allow for the feeding of bees. Right now if beekeepers feed their bees sugar for winter supplement then their organic certification will be revoked. There is a request from both Alberta and Quebec for help.

One of the topics on indoor wintering was cancelled due to a speaker not being able to make it to the conference, however they did have a panel discussion on this subject and

they showed some new facilities that are being set up or are in operation. They have gathered technology from Canada and the US to do this. The two goals that they have are to create brood breaks so that the bees can be treated for varroa, and of course wintering. Some are put into the buildings before almond pollination, and then when the pollination is finished, they are returned to the sheds for the brood break, treated, and then sent on their way.

There is some interesting research happening – the influence of propolis deposition on insecticide sensitivity, detoxification activity in the honey bee and effects of sterol biosynthesis inhibiting (SBI) fungicides on honey bee health and pollen phytosterol composition. There is also work going on in Michigan with the slow release of oxalic and formic acids. I was also interested to see that there is work being done evaluating and comparing Amitraz resistance in varroa mite populations in the US and Canada. These are but a few of the ongoing projects.



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An Old Beekeeper Goes Back to School.

Part 6: A Research Project

by Ron Miksha

A grad student needs a project. For the Masters, the new candidate usually depends on a kind-hearted professor to suggest something. Actually, the kindly professor (equally likely to be a tyrant) may have some research goal in mind and is looking for someone to do some work. In this situation, the candidate is usually finishing a first degree and will use his/her network to find a researcher who is accepting grad students. They apply, interview, produce marks and resumes, and maybe get an offer. Another approach is to find a professor with whom you'd like to work. You bring an outline of your own project and see if your interests align.

My outline was of interest to Dr Lawrence Harder, a bumblebee and pollination researcher. My proposal was to try to determine whether honey bees – a non-native introduced species in Calgary – has a negative effect on native bees in Calgary. Native bees had been pollinating native plants here in Alberta for thousands of years before our western honey bees arrived from Europe, a mere 150 years ago. Alberta has over 300 species of native bees, some as different from each other as mice and elephants. Most will happily work any flower they can access with their proboscis. These are generalists. In contrast, a minority of native bees are specialists which focus on a single type (or very small group) of flower species. Specialists can be especially vulnerable – a change in landscape might reduce their supporting flowers, making their bee population crash. This usually results in extinction (or local disappearance, called extirpation).

Investigating the effects of honey bees on native bees is complicated. As you well know, too many colonies of honey bees in an area reduces a honey crop. Increasing the hive count above what the landscape can support (the area's carrying capacity) will cause honey bee colonies to lose weight, eventually starve, or at least have a miserable time surviving long dearth spells. Beekeepers feed their bees in such situations, but no one is feeding bumblebees, leafcutters, ground-dwelling andrenids, halictids (sweat bees), colletids, and others. When two species compete for the same resources, their exploitation competition often produces winners and losers. This is how some invasive species (including purple loosestrife, Canada thistle, Russian olive, Atlantic salmon, the Norway rat and grey squirrel) have replaced their counterparts in many parts of the world.

In addition to exploitation competition, some newly arrived species fight for physical living space or attack competitors while foraging. This is interference competition. You can think about the two types of competition this way: place a bowl of delicious table scraps between four healthy dogs. If one of them gobbles like a turkey, it will eat most of the food (successful exploitation competition). If one simply blocks the others by growling and nipping, it gets more food through interference competition. Bees rarely display such rude behaviour out in the flower patch. Most of us have seen different species of bees working side-by-side on the same

flowers without interference.

When new species arrive, they have other ways of affecting the environment besides out-competing the domestics. In the case of honey bees, they can spread viruses – deformed wing virus (DWV) has been spotted recently among bumblebees in BC, for example. In England, 11% of bumblebees picked up DWV, which has shortened their lifespan by one-third (Fürst et al. 2014). The spread of *Nosema ceranae* has likewise jumped from honey bees to other bees with serious results.

Finally, honey bees' favourite flowers (including dandelion, Russian olive, Canada thistle (originally from southern Europe), purple loosestrife, canola, alfalfa and all types of clover) are not native to North America (Columbia University, 2020). If honey bees help these plants spread, the plants take up resources and space that once belonged to native wildflowers.

For my research, I am focusing on exploitation competition – do honey bees collect so much pollen and nectar that other bees can't thrive? To understand this, I mapped nearly all the kept honey bees in Calgary. I found that honey bees are not evenly distributed – in places there are a hundred times as many honey bee foragers. This is good for my research because I can compare how well native bees do in areas where there are lots of honey bees compared to areas where honey bees are scarce. I've also mapped out the flowers in Calgary to get an idea of how many bees different neighbourhoods could support. There's so much more involved – 400 bumblebee boxes and leafcutter trapnests, 240 biodiversity sample bags, one hundred citizen scientists, pollen analysis, dozens of maps...and so much more. That's where we'll pick up next time here in *BeesCene*. ☘

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Ron Miksha is an MSc candidate researching bee ecology at the University of Calgary. He has been a commercial beekeeper but now keeps two hives behind his house in Calgary. He can be contacted through his blog, badbeekeepingblog.com.

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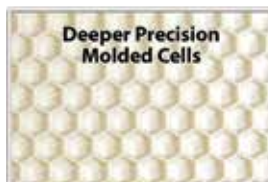


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Best Practices in Bear Fencing

by Gillian Sanders

Gillian Sanders works to help people protect livestock, apiaries and crops from bear predation through her program, Grizzly Bear Coexistence Solutions. She presented information on her work at our fall 2018 AGM in Victoria and will be presenting at the semi-annual meeting in March.

I learned about using electric fencing to protect beehives when I first started beekeeping in 1996 at a remote farm near Kaslo BC. When I moved to a homestead the following year and started my own hives, I installed electric fencing to protect them from bears as we had black and grizzly bears in the area. As my dogs got older, I expanded the fence around my chickens and goat night pen to also keep them safe from bears.

I began my bear education work in 2005 and was first called out by the Conservation Officer Service in 2007 to install electric fencing around a chicken coop in North Kootenay Lake where a mother grizzly bear and three cubs were sighted. The fence was effective and the chickens were kept safe. I began an electric fencing cost share program the following year in the Meadow Creek area and expanded to the Kootenay Region in 2013.

Since 2013 I've helped to install 310 electric fences to protect all kinds of agricultural attractants (beehives, poultry coops, small livestock, fruit trees, and crops) from both grizzly and black bears. I was able to provide a cost share on electric fencing equipment in the Kootenays with funding from Columbia Basin Trust, Transborder Grizzly Bear Project, and Kootenay Lake Local Conservation Fund. There are no other electric fence cost share programs at this time in BC, but I would be interested in working with beekeeper groups to initiate other such programs in all areas of the province. With funding from Habitat Conservation Trust Foundation, I am now providing electric fencing and grizzly bear safety workshops in other areas of BC.

I specialize in preventing grizzly bear conflicts but all the fences I help to install also prevent black bears from entering the area. In most areas of BC there are many more black bears on the landscape so they generally create more conflicts than grizzly bears. Grizzly bears generally have a more fearsome reputation and a greater conservation concern and can act as a useful 'umbrella species' to indicate a healthy ecosystem.

Because of bears' life cycle they are more prone to come into conflicts in their search for food in the spring and fall, especially right before hibernation when they must gain enough fat to survive their long sleep. In years when there are shortages of natural foods (native berry failures, fish population crashes) bears are driven to anthropocentric (human based) food sources to survive and reproduce. Overall I focus my efforts in linkage areas between core populations of grizzly bears to ensure long term healthy populations of bears while human populations and development expand.

A linkage area is where bears and other wildlife may live and move through to provide connectivity to core populations in more remote areas. Linkage areas are often in human settled valleys associated with roads, highways, and rural properties.



A young grizzly that Gillian worked on with the Conservation Officer Service, who was released after they collared her to track movements. The property owner who had trouble with her now uses electric fencing for their livestock, fruit, and beehives and they have had no further bear conflicts in recent years, despite the collapse of the local kokanee salmon run.

Maintaining linkage between core populations is necessary for large ranging animals to have long term healthy populations in the face of expanding human populations and associated development. Linkage areas are more effective to allow grizzly bears to move through safely if the bears do not find human based food sources and avoid conflicts and associated bear mortalities. I have also found that when bears move through private properties but do not cause damage, people's level of tolerance for bears is increased and they may appreciate rare sightings of these iconic symbols of wilderness.

I have helped to install 85 electric fences to protect bee yards throughout the Kootenays. I don't think that bee yards need a stronger energizer than other agricultural attractants for bears, but because of the financial risk if a bear gets into hives,



An 8-wire alternating hot/cold electric fence protecting a permanent bee yard.

I usually recommend at least 6 hot wires around a bee yard (wire and insulators are relatively cheap, so going for more opportunities for the bear to receive an effective nose or face shock with additional wires makes sense).

I have regularly seen that one or two hot wires are not enough to deter bears. They may work some of the time, but bears' thick fur can insulate them from the shock. If the lowest wire is more than 8" from the ground on a stand-alone electric fence, a bear may be able to slip under the wire and even though the wire slides down the bear's back it does not deliver a shock. I have found that a nose or face shock is very effective to deter bears, even those who may have previously caused damage before electric fencing was installed. Six hot wires are usually good for a small area with a high voltage energizer of at least 1 or preferably 2 Joules and 7,000-volt output. The wires are placed 8" apart so to deter digging (the bottom wire at this height is hot) and to provide a shock at nose height to all bears, from a black bear cub to an adult male grizzly bear. The fence does not have to be more than 4' high as while bears dig, climb, or rip thru fencing, they don't jump!



Bear damage to hives prior to installing electric fencing.

For a larger area and/or in dry soil conditions, it is recommended to alternate hot wires with grounded cold wires that are connected to the ground system of the fence, and to have additional ground rods or plates to ensure a good ground with the fence. For more details on this, please see my YouTube video: <https://www.youtube.com/watch?v=lqIRMavnahE>

In terms of fenceposts, I like some of the new very durable fibreglass posts that are available; make sure they are hard and not too bendy. The benefit to fibreglass over metal posts is that fibreglass does not conduct electricity so that if a wire slips from an insulator and touches the post it will not ground out the fence.

Placement of bee yards should be considered with a good flight path for bees (usually facing south or southeast) and ideally away from people, walking paths or traffic. Placing yards in open areas will help to lessen their attractiveness to bears as bears usually want to sneak in under the cover of trees or bushes. Also, if a tree branch falls on the hive it can obviously damage the hive but also ground out the fence.

When I've placed my bottom hot wire at 8" from the earth I have not experienced bears successfully digging under the wire. If there was digging present before installing the fence, I

have spliced onto my bottom hot wire and placed a stake with insulator in the dig spot, so to fill in the gap with hot wire(s) to ensure nose contact the next time the bear tries to dig under. Alternatively, one can also use a heavy metal mesh fence lying horizontally on the ground around the outside of the fenced area to deter digging. If this metal mesh is connected to the ground system of the fence it will ensure that a bear standing on the mesh who also touches a hot wire(s) will receive a strong and effective shock.

There are some who bait wires in order to encourage a bear to touch the wire with their mouth or nose. It is illegal to bait dangerous wildlife in BC, and if one installs a decent electric fence with 6 hot wires, good grounding, and decent energizer there is no need to bait a fence. However, I have baited fences when I am teaching a bear that has already learned the unacceptable behaviour of wrecking hives or killing livestock to be sure the bear gets a very effective nose shock. In this way we can reverse the learned behaviour and keep the bear alive. If anyone baits a fence, they need to realize that they may also bring in a bear that may otherwise have minded its own business or a neighbour's dog, resulting in potential conflict with that neighbour. Build a good fence and be diligent in maintaining the fence, and there is no need to bait.

There used to be fence energizers on the market that were advertised to "burn through weeds and brush" so to avoid maintaining the fence. Apparently, there were some fires started with these energizers, and they are no longer available for the most part. I do not recommend using such an energizer! Remember that there are 3 things needed to start a fire: O₂, fuel, and spark. We can't control O₂ in the air, but we can control fuel and spark through diligent fence maintenance. A fence only sparks if it is shorting out, so be sure to maintain the fence to avoid this. One simple way of identifying shorts is to look carefully at the fence line in the dark (you can see a spark) and to listen for the 'tick...tick' sound associated with a short.

It is always prudent to maintain a clean bee yard to minimize attractants to all potential pests such as yellow jackets, mice, or skunks. For bears, they will be attracted to other foods such as garbage, bird seed, compost, fruit trees, pet foods, livestock and feed, etc, and we can prevent the vast majority of bear conflicts by managing these potential food sources. Electric fencing can also be used around fruit trees, chicken coops, or livestock pens to protect them from bear damage.

I am happy to provide troubleshooting advice for beekeepers that need help upgrading their fence to ensure it is effective to keep bears out. I can be reached via email at grizzlybearsolutions@gmail.com or through my Facebook page, Grizzly Bear Solutions. I don't have funding to provide this on a large scale, but I'd like to support our beekeepers in this way. ☼

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Semi Annual Speakers

Miriam Bixby Research Associate at UBC and Lead Socio-Economic Researcher on the Bee CSI Project

My dad kept bees on our apple farm in Nova Scotia when I was very young and so when I had the opportunity to work on a honey bee project with Leonard Foster's team it felt like coming back to my roots. I was so thrilled to be able to learn more about bees as an adult and share what I was learning from my colleagues about bee science with my dad. I spent time studying environmental sustainability in University and have always been inspired to contribute to mitigating our current environmental challenges. My background is in environmental economics and resource sustainability so I am relatively new to the world of bees and have learned a great deal about their incredible queen-led colonies. I am inspired by the work ethic and social systems of the honey bees as well as the creativity and wisdom of my scientific colleagues. Honey bees are the only insect that produce food eaten by humans as well as pollinating so many of our food crops; it is our responsibility to give back to this generous species who we are indebted to.

My background in applying economics to address and better understand environmental issues such as climate change allowed for a pretty smooth transition into looking at the ways in which economics and society play a role in colony health management, particularly the costs and potential opportuni-

ties associated with new IPM technologies. Leonard's team has been such a wonderful inspiration to me as I navigate the wild world of honey bees and learn from these incredible scientists.

My role in our research is to better understand the needs of beekeepers with respect to how they manage their bee health in Canada, both economically and socially, and to communicate these needs to our science teams. Armed with a clearer vision of how we can use genomic science to improve beekeeping and bee breeding, our scientists have been developing tools to assist beekeepers in ameliorating colony health.

I love talking to beekeepers and learning about their challenges with honey bee health and their innovative management strategies. I am currently looking for interested beekeepers to participate in our most recent project, BeeCSI. If you're interested in spending some time chatting with me about your bees, please get in touch: Miriambixby@gmail.com or (604) 808-1472.



Brandon Kingsley Hopkins

Assistant Research Professor at Washington State University in the Department of Entomology. His research efforts have been focused on developing practical solutions for the beekeeping industry ranging from bee breeding to varroa control.

My interest in bees started in the lab as a master's student working on cryopreservation of honey bee semen. I then got a chance to work on my PhD in a bee lab and there was able to learn a

lot through field work. I have been hooked on bees ever since.

My initial mentor/PhD advisor was Dr. Steve Sheppard. I learned a lot from our beekeeper technician at the time, Beth Kahkonen. Through his publications, a lot of my cryopreservation work was based on research by Dr. John Harbo. I have been influenced and have learned a lot from commercial beekeeper collaborators: Eric Olson, Nick Noyes, Tim Hiatt and many others.

I ended up studying cryopreservation because of a senior capstone course I took – Human Embryology. In the lab section of the course we worked with mice - we collected embryos, performed IVF, etc. During my masters degree, I worked on mice to start, but there are million researchers

working with mice. At the time there was a lot of news about endangered frogs, and the current method of preserving semen in frogs required the frog to be killed, which didn't seem like a good way to help an endangered species. I worked on cryopreservation of frog semen collected by non-lethal methods.

There were no bees at the university where I did my masters degree, but about that same time Dr. Sheppard and Sue Cobey were beginning the importation of semen from the Old World. Dr. Sheppard sent us a tube of bee semen to work on methods for freezing. With promising results in the lab, I was offered an opportunity to pursue a PhD in Sheppard's lab at WSU. I didn't have a specific interest in honey bees to begin with, but the fascinating social structure, the fact that you can manage an innately frightening insect colony with tens of thousands of stinging individuals without getting stung (most of the time), and the welcoming and friendly beekeeping community quickly hooked me on the study area.

We collaborate with commercial beekeepers in a few different ways. Right now we are working with commercial beekeepers in almond orchards in California. We are assessing

colonies for health and strength, and mite and virus samples are taken. We also work with the beekeepers to apply certain treatments, and beekeepers help us with colony transport and tracking management actions. We also work with commercial queen producers by providing breeder queens with genetics from our semen importation program, and they provide feedback and daughters from those queens for further testing.

Leonard Foster

Professor in the Department of Biochemistry
and Molecular Biology at UBC



My parents were hobby beekeepers and some of my earliest childhood memories were of getting really sticky helping them extract honey. I also remember LOVING to eat the cappings with honey dripping from them! My dad was also a high school science teacher so my

parents got me involved in school science fairs from Grade 4 onwards. From grades 9 through 12, I did a series of projects looking at the antibacterial properties of propolis. I remember my great aunt telling me that this was something that First Nations people used to treat sore throats. Then, when I got older and realized that honey bees are not native to North America, I realized that this was probably not true! In any case, the summer between grades 11 and 12, I contacted Mark Winston at SFU and went to work for a month in his lab. It was there that I first met Heather Higo. After starting undergraduate studies at SFU, I worked each summer as an undergraduate research assistant for Keith Slessor and Mark Winston; this was my first introduction to bee research.

The thing I enjoy most about working on honey bees is the people I get to interact with. This starts with the grad students in my lab, who are incredibly dedicated, passionate scientists who make it fun to come to work every day. It also includes all of the beekeepers around the province that we have worked with on many projects. In my line of work (biochemistry), no one gets to do field trips. But I get to do field trips every year and have met all kinds of interesting people who are passionate about bees. And the third group of people is the general public. There are very few disciplines of science that attract as much attention as honey bees - I have really loved being able to engage so many members of the general public on bee science.

When I started my own lab at UBC, my research was focused on understanding how *Paenibacillus* larvae causes American Foulbrood. Shortly after I started, bee die-offs spiked and all of a sudden bees were really sexy! Over that time, I have continued to do a lot of basic research on how pathogens affect bees and how bees defend against pathogens. For the last 12 years or so, we have started using the proteomics technology that we are good at to try to do some applied research that will improve bee health. We have shown, for the first time anywhere, that molecular markers can be used to selectively breed for disease resistant traits in honey bees. We are now moving into two new areas where we can apply our technology: to better diagnose what is causing bees stress and to detect fraudulent honey.

Heather Higo

BC Bee Breeder

and Honey Bee Research Scientist



Heather's talk will be focused on practical queen management, including handling queens, requeening, queen quality and more. She has been involved in honey bee research for over 30 years and has also been running her own queen rearing operation since 2007.

In my most recent research, I worked on queen selection tools with the proteomic marker selection project for hygienic behaviour from 2015 to 2018, making these marker selection tools available to local bee breeders and helping them to incorporate this new selection tool into their own queen rearing operations. I was also involved with the BeeOmics project and the Bee Health in Blueberries research.

In 2019 I worked for Erika Plettner at SFU, field testing a potential new varroacidal compound. I set up and ran the first field test for a promising new compound coming out of Erika's Chemistry lab. Previously, the compound had appeared effective in the lab, but this was the first set of field trials on full size colonies. After we had built up mite levels in the colonies, we inserted either control applicators, or those impregnated with the test compound and compared mite drop in both control and test colonies over several weeks. The results appear promising, but it is in the early stages, and much more field testing is required.

In 2020 I am returning to the Foster Lab at UBC, managing the BC field work portion for the multi-province BeeCSI project to identify stress markers in bees in response to blueberry and cranberry pollination and other factors.

I am intrigued by how much we still don't know about honey bees, and the wealth of new knowledge that continues to bombard us - both what is learned by observant, careful beekeepers and scientific researchers! It continues to surprise me how resilient our bees can be at a time when they are often faced with deteriorating forage and increased pests, pathogens, and chemicals in their environment. We talk about high losses, but we need to appreciate (and continue to breed from) the really successful colonies that survive well despite the environmental challenges they face.

In my own operation, for years I have been aiming to

produce queens from mothers whose workers display not only good overwintering, strong spring build-up, and gentleness but also high hygienic behaviour (HB) in an effort to increase their resistance to both mites and diseases such as chalkbrood and foulbroods. This last year, I had one queen line that not only field-tested 100% in HB via the freeze test and was at the top of the proteomics selection for HB, but this line also had 0-1% mite levels when other colonies in the same apiary had mite levels that were skyrocketing. I realized that the practical litmus test of low mite and disease levels can be related back to hygienic behaviour even within my own operation. I have always preached regular mite monitoring, following recommendations from the Ministry and Paul van Westendorp, but going forward, repeated monitoring of mite levels for me will be more than a tool to assess when to treat - I will use mite levels in conjunction with my HB results and other selection criteria to select my next generations of queens.

Albert Robertson
Saskatraz Founder, Bee Breeder
and Molecular Biologist



Albert currently operates approximately 1400 colonies for honey production, raises 600 to 700 nucs as well as about 2000 Saskatraz queens for sale each year. He will present talks on the research behind the Saskatraz project as well as on the practical side of queen rearing in Saskatchewan.

I started keeping honey bees in 1975 with 4 packages and by 1981 we had about 800 colonies, and I began honey bee breeding in 1992. I became interested in bee biology after keeping bees for a few years. I read a lot of books and scientific articles on bees and learned to work with bees by experience; honey bee colonies were my mentors. Our main focus in Saskatchewan is honey production, however we also run an intensive breeding program, and we produce queens and nucs for stock replacement and for sale. Our Saskatraz breeding program has been supported by stock sales, but I have collaborated with University of Saskatchewan researchers to perform molecular work on honey bees since about 2007.

I started breeding honey bees because of my background in genetics and molecular genetics and the interesting life cycle and the honey bee. I started by selecting for honey production, wintering ability, and chalkbrood resistance as well as other brood diseases in 1992. The selections were performed annually from as many as 30 to 40 apiaries. The selected colonies were moved to an isolated area for close population mating with two or three of the best breeders from the group. The resulting progeny were used for restocking our commercial operation and expanding colony numbers. The

objective behind this approach was to improve economic traits in our colonies.

The challenges changed with the arrival of tracheal and varroa mites in the late nineties. I focused my breeding strategy on natural selection for tracheal and varroa mite resistance, using stock previously selected for economic traits. No miticide treatments are used in our natural selection apiaries. We also added stock previously shown to have tracheal (Buckfast) and varroa tolerance (Russian, VSH). Our breeding efforts continue using recurrent natural selection. This procedure involves a continual selection of progeny by cycling through natural selection in apiaries in an effort to enrich for genes with resistance to mites while maintaining economic traits.

Joe Lomond
Ashcroft Apiaries
Joe's talk will be on the importation of queens

Joe was born in 1940 and raised in the Codroy Valley, 30 miles inland from Port Aux Basque, NFL, and is the eldest of 13. He joined the Air Force in 1961 and was transferred out West in 1963 to Puntzi Mountain 120 miles inland towards the coast from Williams Lake. Joe met and married Marg in 1966 and got a job at Highland Valley Copper where he worked as an electrician for 32 years. He has been retired from the mine for 20 years now.



After asking a fellow electrician a million questions about bees, he decided to buy a couple of packages from Campbell Jones. Campbell became his mentor, and Joe also took his beekeeping course through Cariboo College. We had those first hives set up in our backyard in Ashcroft; someone sprayed their garden nearby and a month later, one hive died, and the other one died over the winter. We bought more packages in the spring, 60 hives from Bill McCormack and 150 from Bob Meredith in the years following. We got up to 499 hives but lost 70% when the mites arrived.

The city lot in Ashcroft wasn't big enough for storage and extracting in a school bus attracted many bees from the surrounding area. Good thing our neighbours liked honey. Consequently, we moved out of town to the Walhachin area where we have been ever since. We had one good year, probably 1996, when the bees filled all the supers and anything else that you put on top of them with honey.

We became involved with the Kamloops Beekeepers Club and have attended many conventions of the BCHA, Alberta Beekeepers, Saskatchewan Beekeepers, American Beekeepers Federation and also a few WAS meetings. Beekeeping is fascinating, you are always learning something new and meeting new people, and it's surprising to realize how little you really know. In our experience importing queens, we've

found that Cordovan queens are some of our favourites. The thorax of these queens is an orange color. They are easier to find on the frame and their worker bees are milder.

Joe's favourite parts of beekeeping are being his own boss in the outdoors and talking to other beekeepers. He enjoys helping new beekeepers and older ones if they have problems, it is an interesting hobby and gives him something to do in his retirement.

James Macdonald

BC Bee Breeder and Honey Producer

James will give a talk about his honey and bee breeding operation in the Okanagan



I was drawn into the bee world after abandoning my career path in the printing industry in Toronto. Subsequently I audited

the Apiculture Program at the University of Guelph in 1978, taking advantage of the best beekeeping library in Canada!

Bees have introduced me to all the most wonderful people in my life all around the world. I have been keeping bees for the past 41 years and currently operate Armstrong Apiaries Honey Company in Armstrong, BC. My early experience working on commercial honey operations taught me how not to keep bees. In Saskatchewan in the 1970s, the standard for producing honey commercially was to import packages of honey bees in April and then dispatch the full colonies with a puff of cyanide in September. Thankfully, times have changed!

In the 1980s, I became part of a team that implemented the Honey Bee Stock Improvement Project in Vernon, BC. Local BC queens were a result of this landmark breeding program, and they are now raised by a number of queen producers throughout the province.

I have been raising queens here on Grandview Flats and producing honey and nucleus colonies in the Okanagan Valley for the past 30 years, and every year is a new challenge. My focus has been on selecting stock for honey production and overwintering and will continue to be for the next 30 years.

Working in Africa and Asia over the past 30 years has also provided me with a wide range of beekeeping experience with a number of species of honey producing bees. I am extremely pleased to see the interest and concern from society at large for the survival of honey bees and the importance of their role in the health of the planet. 🐝



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

CLIPS FROM THE PAST

100 Years of Beekeeping in BC History Project: An homage to introduced bee forage plants and the development of beekeeping in BC

by Ted Hancock

Early Agriculture in BC

White Clover (*Trifolium repens*) is a long lived, shallow rooted perennial native to Europe and Asia. The first record of it being cultivated as a forage crop was about 1759 in Holland. Hence, it is sometimes referred to as White Dutch Clover. A European tourist named Strickland who visited the United States in 1794 noted that white clover was prolific:

...growing frequently with a luxuriance and perfection that art can rarely equal in Europe. I am told it is never met with far back in the woods, but immediately on their being cleared away, either by fire or otherwise, it takes possession of the ground; which should prove that it was natural to it; that the seed lies there, but cannot vegetate till the ground is cleared; but again I have been told that by some tribes of Indians it is called 'white man's foot grass' from the idea that wherever he has trodden it grows; which should prove at least that it had not been known longer in the country than the white man.

It seems likely that White Clover was first introduced to British Columbia by Hudson Bay Company (HBC) packers in the 1800s. We know from HBC reports that it was the company's practice to sow a variety of imported seeds along Brigade Trails to improve forage for pack animals. In July of 1851, James Douglas, chief factor of HBC in Victoria, wrote a letter to Archibald Barclay, HBC secretary in London to report: "There are now about eight acres of Timothy Grass at Fort Hope, and that or other kinds of grass, at every encampment on the mountains, in sufficient quantities for one or two nights consumption." Apparently Douglas needed more grass seeds as he had written Barclay in April of 1851:

I forward herewith a small Requisition for various kinds of grass seeds which I beg may be forwarded by the first ship bound to this Island — We entreat that the seeds may be fresh and of the best Kinds — I am informed that seeds put up for abroad are often mixed with inferior and damaged sorts — which would be serious disappointment in our case. These seeds should be put up in bags of convenient size, packing in tight casks and frequently aired in fine weather only, by a careful person, during the voyage to this country. That plan was followed by Mr. Harvey, with the seeds under his care, and succeeded better than any other that has been tried.

Douglas wrote Barclay again in October of 1851 to request garden seeds:

I have to request your attention to an order for Garden seeds herewith, which I beg may be forwarded by the way of York Factory, in the Bay Ship of 1852, as the sea voyage to this country by Cape Horn generally proves destructive to seeds. The weight of the whole order will not exceed two pounds, and if forwarded immediately from York Factory by the Saskatchewan Fall Boat, and afterwards as stated on the order they will reach this place in April 1853 early enough for sowing.

HBC records also include an invoice for a shipment of seeds from Fort Victoria to Fort Langley. The date of this shipment is unknown but it was likely sometime during the 1850s.

Invoice of Grass Seeds Forwarded per Canoe to Fort Langley, and consigned to James M. Yale Esquire
1 Bush. perennial Rye Grass
1/2 Bush. Cockefort Grass
1 bushel Italian Rye do
8 lbs. Red top Clover
6 lbs. White top Clover
2 lbs. Foxtail Grass
2 lbs. Rib Grass
2 lbs. Cow Grass
4 lbs. Trefoil Grass
2 Bush. Italian Rye Grass

Although British Columbia has many native plants that produce nectar and pollen, the beekeeping industry in BC has benefited from the cultivation and spread of imported plants. These include white clover, red clover, alsike clover, alfalfa, sainfoin, sweet clover, thistles and dandelions. Most of these are deep rooted and drought tolerant, so have 'volunteered' in many pockets of our landscape.



Alfalfa invades rangeland near Dog Creek where old railroad track killed sensitive native grasses.



Volunteer sweet clover growing in Dog Creek valley.



Canada Thistle, *Cirsium arvense* is not native to Canada. In its native home (Europe and Asia) it was called 'Cursed Thistle' or 'lettuce from hell thistle'. It was likely introduced into BC accidentally via imported grass/forage seeds.

Early Beekeeping in BC

The BC Ministry of Agriculture published its first annual report in 1891 when the number of farmers was estimated to be 5000. During the 1890s, deputy minister of agriculture James Anderson routinely sent out a list of questions to farmers or “correspondents” scattered around the province. One of the questions he asked was, “Bees – Has apiculture been tried, and with what results?”

The responses to Anderson’s survey were included in the annual reports, giving us some idea of the level of beekeeping at that time. Many respondents completely ignored the question about bees. Others simply stated “No”, or “Have been tried without success”. In his first report (1891), Anderson summed up the state of beekeeping in the province:

The production of honey has, until lately, received little attention, having been attempted only in a desultory sort of way, generally resulting in disappointment. It is now being successfully produced, and found to be a profitable industry.

It appears beekeeping was most successful in the Lower Mainland at that time because:

industry. White clover grows very abundantly, and the moisture in the soil keeps it in bloom until late in the summer, after which a plant locally called prairie queen (*Eupatorium purpureum*) affords a plentiful flow of honey of rather dark colour, but of excellent quality.

One of the more successful beekeepers during the 1890s was J. S. Smith of Chilliwack. His report from 1894:

“J. R. Anderson.

“DEAR SIR,—In reply to your enquiry how bees do in this country, I beg to give you a statement of my success, etc. I came here in the fall of 1889. I was told that bees did not do well here, owing to the wet weather. I bought 8 hives; 7 came through the winter in good condition; these increased to 43; summer of 1890 took about 300 lbs. honey in, and came through the following winter with 39, which increased to 83, and took about 6,000 lbs. honey; these wintered well; came out with 78 the following spring of 1892, but, owing to rain for about 3 weeks, lost most of the white clover, the mainstay for honey here; increased this year to 150 hives, and got about 6,500 lbs. honey, but the following severe winter of 1893 lost over one-third, and a great many came through weak; then followed a very late and backward spring, with no honey until after the 1st of July, when we had 6 weeks of the finest honey flow I ever saw, when we got about 7,000 lbs. of comb and extracted honey. We went into winter quarters last fall with 125 hives; to date about 97 per cent. have wintered well, and we look forward to a good season. To make a success of bee-keeping here, to commence with, a man wants to understand the business, like every other calling, and have a liking for it. It requires a good tight hive to keep out the wet, but very little protection, as the winters are generally mild.

“Yours respectfully,

“J. S. SMITH.”

In the interior of the province, ranchers found alfalfa, sainfoin, alsike and red clover grew well when irrigated. These hayfields allowed plants to escape into the wild. The 1896 report from the manager of Gang Ranch:

Mr. J. D. Prentice, Manager Canada Western Ranching Company, reports:—Wheat, barley, oats, rye, etc., successfully grown; frost never hurts grain; agricultural lands are so scattered, and transportation so difficult, it is not profitable to run flour mills; roots and vegetables grow well; timothy is the chief fodder; other grasses are red clover, alsike, sainfoin, alfalfa, rye-grass, Australian brome grass; no hay sold; timothy is not recommended for this district; consider alfalfa the best forage plant; cattle-raising is more or less successful; am of the opinion that sheep cannot be raised profitably here; the raising of good heavy team horses has been profitable; no sheep raised in this district; hog-raising not attempted systematically; irrigation necessary. I don't know of any Government land in the district for pre-emption; land seldom changes hands.

Some other reports from correspondents during that decade were

REV. D. HOLMES, DUNCAN'S.—All of swamp land (180 acres) is reclaimable. Wheat, oats, barley, corn, and all kinds of roots are well adapted. Fall wheat is best, but spring wheat will do well; must be sown early. The Canadian Banner oats I find, by testing, the most free from smut, and ripen earliest. Cory corn ripens well. I have had timothy 16 years, and good yet; does not run out on my land. Clover grows luxuriantly, alsike very heavy, but timothy runs it out; orchard grass best for pasture and high land. Bees do not thrive—flowers deficient of honey. Durham cattle for beef; good selected grades for milk. Leicester sheep best for wool and mutton.

From Edmund T Wade, Surrey Center:

7. Bees.—Two or three persons have gone into this business with good results. One especially, rather extensively, he having about 50 hives with every convenience; he informs me with very good results, pays him well.

Mt Lehman correspondent:

* BEES.—Some nine or ten hives of bees, which were doing well, were all killed by the excessive cold of the winter of 1892-93.

Nicomine Island:

Everyone that has bees has a good word for them; they are becoming almost universal, the honey being chiefly used for home use.

Finally a Mr. Hoey of Lillooet wrote in his 1893 report:

12. Thirty-two years ago I brought in a hive of bees; they did well. I did not understand their management, and they either died or left. The clover blossoms and wild flowers are covered with wild bees.

The UBC library has published these and other early government reports which you can find online at <https://open.library.ubc.ca>.

The source of the HBC letters was a blog by Nancy Anderson, <http://nancymargueriteanderson.com/>.





A Unique Opportunity

Unique books on beekeeping from Doug McCutcheon's library; Doug has retired from beekeeping and has offered his collection to the BCHPA. Below is a list of the books and their market value. They are for sale now at the fair market price and any remaining will be placed in the silent auction at the 2020 Semi-Annual meeting on March 27 in Kamloops. If the target market price is not met, some may be held over to the October AGM. Please contact Ian Farber to purchase (shipping not included): ian_farber@telus.net.

Bees and Beekeeping by Roger A. Morse, 1980, hardcover, **\$10**
 Honey Plants Manual, Practical Field Guide for Identifying Honey Flora
 by H. B. Lovell, 1966, **\$10** (2)
 Honeybees and Wax, an Experimental Natural History
 by H.R. Hepburn, 1986, hardcover, **\$50**
 Some Important Operations in Bee Management by Johansson and
 Johansson, 1978, **\$10**
 One Hundred Years of Beekeeping in BC, by W.H Turnbull, **\$25**
 American Honey Plants by Frank C. Pellet, 1977, hardcover, **\$15**
 Honey and Pollen Flora (Australina) by Alan Clemson, 1985, **\$150**
 ABC & XYZ of Bee Culture by A.I. Root, 1975, hardcover, **\$15**
 Bee Chats, Tips and Gadgets by P.F. Thurber, 1986, **\$10**
 Manual of Beekeeping by E. B. Wedmore, 1979, hardcover, **\$10**
 The Biology of the Honey Bee by Mark Winston, 1987,
 hardcover, signed, **\$20**
 The Varroa Handbook, Biology and Control by Mobus, B and
 Connor, L, 1988, **\$5**
 The Hive and the Honey Bee by R.A. Grout, 1963, hardcover,.... **\$10** (2)
 The Life of the Honey Bee by M. Maeterlinck, 1954, **\$15** (2)
 A Living from Bees by F.C. Pellet, 1st ed. 1947, **\$15**
 Beekeeping by E.F. Phillips, 1947, **\$10**
 The Behaviour and Social Life of Honeybees by R. Ribbands,
 1st ed. 1953, **\$25**

Amateur Beekeeping by E.L. Seachrist, 1st ed. 1955, hardcover, ... **\$15**
 The Introduction of Queen Honey Bees by L.E. Snelgrove, 1st ed.
 1940, hardcover, **\$40**
 Swarming, It's Control and Prevention by L.E. Snelgrove,
 1956, hardcover, **\$50**
 Queen Rearing by L.E. Snelgrove, 1966, hardcover, **\$25**
 Honey: A Comprehensive Survey by E. Crane, 1st ed. signed,
 1979, hardcover, **\$300**
 Bees and Beekeeping by E. Crane, 1st ed. 1990, **\$300**
 First Lessons in Beekeeping by C.P. Dadant, 1994, **\$10**
 Anatomy and Dissection of the Honey Bee
 by H.A. Dade, 1977, **\$25** (2)
 Crop Pollination by Bees by K. Delaplane, 1st ed.
 2000, hardcover, **\$150**
 Pheromones of Social Bees by J.B. Free, 1st ed. 1987, **\$25**
 Revised Honey Plants (Lovell) by L.R. Goltz, 1977, **\$10**
 Dadant System of Beekeeping by C.P. Dadant, 1st ed. 1920, **\$50**
 The Hive and the Honey Bee by C.P. Dadant, 1927, **\$15**
 A Thousand Answers to Beekeeping Questions
 by C.C. Miller, 1st ed. 1917, **\$20**
 Beekeeping by E.F. Phillips, 1st ed. 1915, hardcover, **\$25**
 Bees and How to Keep Them by F.L. Sladen, 1st ed. 1916, **\$25**

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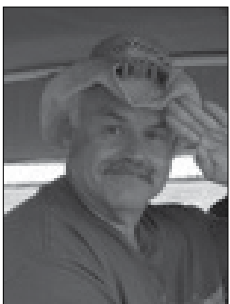


Terrace/Smithers
~ Christine McDonald

This winter has not been one for the faint of heart here in the Northwest. We've seen every type of weather that a beekeeper might stress about over the past few months. Over 2 metres of snow fell on Terrace area hives in December and January, leaving

nothing but little snowy pyramids on the landscape. We've been through one extended deep freeze that buffeted us with frigid northern winds, and now the warm spell is threatening us with moisture while also lulling us into believing that spring might be on the way. Like most northern beekeepers, we have spent the winter clearing entrances, crossing our fingers, and watching Ian Steppeler videos on repeat just to hear the comforting buzz of bees in flight.

Beekeeping continues to grow in the northwest region, with some exciting things happening within the younger demographic. The 4H club in Smithers is expanding its bee program, Kitimat City High is setting up their first hive, and Farm to School BC has purchased an observation hive to make the rounds of local schools. Many new beekeepers have signed up for the Beginner Beekeeping Course being hosted by Skeena Valley Apiaries this spring and/or for Rushing River Apiaries beginners' mentorship program. For now, we wait for the snow to melt and for the sun to bring the bees out on a long-awaited cleansing flight to truly ignite our excitement for the season to come.



Prince George
~ Barry Clark

It is January 28th as I prepare this report. We have had what I would call a normal winter. At the farm the mercury tested the lower limits of its range in mid-January with a few record lows being recorded. It got to -45 early one morning, and there were plenty of days where the wind got us to those ranges

even when the thermometer read -30 +/-.

It has warmed up now. We've had a few days in the +5 range, and folks have been checking their colonies for survival first, then food stores. I am cautiously optimistic, although it is way to early to be counting winter survival.

Beekeeping news from around the area: The Robson Valley Beekeepers are now finalizing their registration as a new association and they are working on grant applications and building their membership base and programs. This spring they are putting on a 2 day Introduction to Beekeeping workshop in Dunster. Plans are underway for a celebration of the Day of the Honey Bee this coming year; last year's was a big community success. The Robson Valley wasn't spared the severe winter cold, I am told they got to -44 and up to +5 in

a 4 day span.

For readers in the Robson Valley, their group usually meets on the last Friday of the month at the McBride library.

Vanderhoof and area beekeepers are meeting on February 5th for their AGM. A beginner beekeeping course is underway there starting today.

Projects and Events planned for 2020 in the Prince George area include Seedy Saturday on March 7th at the Lutheran Church, Club Field Days in June and September, Day of The Honey Bee near the end of May at the PG Farmers' Market, The BC Northern Exhibition in mid-August and the Fall Fair in downtown PG in September.

The Prince George Branch of the BCHPA meets on the 2nd Monday of each month at the College of New Caledonia, right here in Prince George. The meeting starts at 7pm (current room number is 1-311). If you're in town, drop on by and meet the local beekeepers. Also check out the club's Facebook page, you will find all kinds of info there, including upcoming courses, meetings, movies, sales, opinions - you name it. You won't be disappointed.

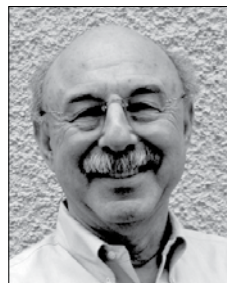
Best beekeeping wishes to everyone in 2020 from central BC.



North Okanagan
~ Richard Plantinga

The first part of winter had steady temperatures at just above freezing which prevented any flights and hopefully kept the bees from consuming too much of their stores. So, to the end of January, we have not had any warm days that allowed cleansing flights. Recently we actually

had some -15 temperatures and even snow, but now back to steady, about freezing. Not much to do now but plan for spring and make sure the entrances are open.



Metro Vancouver
~ Allen Garr

My back is still sore. I think I must have pulled a muscle shoveling snow 10 days ago. We had an extraordinary dump, over a foot, which is nothing for Prince George, but for down here it was Snowmageddon. Ice was falling off of Lower Mainland bridge

structures and smashing windshields. Eighteen wheelers were jackknifing on the Trans Canada. ICBC was doing a record business.

The Richmond Beekeepers Club postponed their annual general meeting for a month due to the weather. But when it melted away we had torrents of rain that just wouldn't quit. A small lake formed in my backyard. The Richmond club did manage to meet a week later and in an exercise of hope

defeating experience, had a lecture on bees and pollination while handing out packets of seed from West Coast Seeds for spring planting. That is the same company, by the way, that took over Urban Bee Supplies in Tsawwassen a short time ago.

Now as I write this the sun has popped out momentarily; steam is rising off my back fence. I observe that tulips, daffodils and snow drops are poking their noses up. And, wouldn't you know it, my bees are flying.

Bee clubs across the region are scrambling ever since Iotron, (the only company that offers electronic beam sterilization west of Lakehead) would not be repeating last year's policy of inviting all comers no matter what their load to drop off their hives. You may recall the line of vehicles last year which was endless. To make matters worse, Iotron's equipment kept breaking down. Instead of shutting down at 4pm, they kindly ran until 8pm so folks coming from up country and the Gulf Islands could get home and not have to return the following day. Now, while beekeepers have yet to figure out what they have for dead outs, hobbyists mostly will be required, as they have been in the past, to collectively bring in their equipment with an increased minimum order of \$750, or about 125 boxes.

Meanwhile the Richmond club is all abuzz (I can't believe I actually wrote that) because they have landed one of the superstars of the bee world, Cornell University's prolific author and world renowned neurobiologist Dr. Thomas Seeley, for the whole day on October 17th.

And just one more indication that this cycle of life continues to hold us in its thrall, notices have gone out advising people to place their orders NOW! along with payment in advance for New Zealand packages. And by the way, I just checked, and the forecast here is for more rain.



Cariboo
~ Carole Mahood

It's been a lovely mild winter in the Cariboo area, with the exception of a single week mid-January with highs below -30. In some areas we're seeing double-digit temperatures during the last week of January, and the snow is quickly receding. The mild weather has meant lots of activity around the

hives, and supplemental feeding (potentially several times) is needed to get them through to the first spring nectar. While some losses have been reported, club members are cautiously optimistic that the mild and drier winter will result in high overwintering success.

The Central Cariboo Branch AGM was held January 25th with a great turnout from both new and returning members. John Hoyrup and Alf Cassidy were re-elected by acclamation for President and Treasurer, respectively, and all other officers will continue for another year.

Kat Koppe and Jen Stirling will be sharing the role of Education Coordinator for the coming year, and the club is looking forward to several field days planned for locations across the region in Hanceville, Fox Mountain, 150 Mile House, and Horse Lake. The club calendar of events for 2020 is jam-packed, with the aforementioned field days, a Seedy Saturday/Day of the Honey Bee combined event, value-added craft night, and more.



North Vancouver Island
~ Darwyn Moffatt-Mallett

I'm honoured to be taking over reporting for the North Island from Gerry Rozema. My partner and I have recently moved to Errington on Vancouver Island from Squamish, a move we have been trying to make for a few years. We have been reading Gerry's reports to prepare ourselves

and our bees for the move. Thanks for the years of great contributions in this role, Gerry.

After a mild start to winter, January has been an interesting month here on the North Island. We saw a heavy snowfall with almost 2 feet in 48 hours, and it almost all melted again in the next 48 hours. There were temperatures below -10 earlier this month with harsh winds and some power outages, while today (January 25th) was very nearly +10 in the early afternoon sun, and I was able to open some of our colonies to check food reserves and clean bottom boards.

As it will be our first spring in this neighbourhood we are carefully watching the season begin to change and taking some notes. The bulbs are breaking the soil now, and I saw the first snowdrop of the year in bloom. The hazelnut across the street is laden with catkins that look like they may soon offer pollen, and our witch hazel cuttings are blooming. It is an excellent time of year to take stock to see what the first meals of the season could be in our areas, and plan to increase that early forage as the days continue to lengthen.

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"How are your bees doing?" or "How many hives have you got left?" were questions being bounced around at the Oceanside Hive's first meeting of the year. We are often optimistic this time of year, but "it ain't over 'till it's over" seems to be the harsh truth about winter survival.

Some beekeepers mentioned the yellowjacket predation that weakened many colonies which may otherwise have made it through winter (if they didn't succumb in the fall). Some potential solutions to the yellowjackets we discussed were hive entrance design and effective trapping baits and methods. It's a good time of year to dream up and build such things.

If you live in an area that experiences substantial yellowjacket pressure, I want to remind you that as our bees and other pollinators begin to come out of hibernation, so too do the yellowjacket queens. These queens will have mated in the late summer or fall and hibernated alone, waiting for warmer temperatures to begin new colonies. We can be proactive in setting traps or hunting for yellowjacket queens - catching just one can save you from thousands later in the season. Make sure to check in stored bee equipment as it seems to be a favourite hibernation spot. I'm told that yellowjackets don't forage too far from their nests, so queens you kill in the next few months should substantially reduce your yard's worker population later in the year. I personally take great satisfaction ensuring that each one I find fails the hive tool test, but I will use my bare hands if no other tool is available. Let's hope it's just the yellowjackets we have to contend with this season, thanks to the heroics of the Nanaimo beekeepers that dispatched the Giant Asian Hornet nest last year.



East Kootenays
~ Lance Cuthill

What a strange winter we have had here in the East Kootenays. Temperatures in the early part of the winter were just about right for the bees at -6°C and only a few centimetres of snow. This was not to last. Mid-January saw temperatures plunging down to -25°C for several days. Today, the end of January has

us worried with a temperature of +7°C. While +7 is giving the bees an opportunity for a cleansing flight, there is a potential for disaster should a sudden temperature drop to our not unusual -25°C occur.

We have been out changing the shavings bags and putting some fondant on light colonies. The bags were heavy with absorbed moisture and many of them were frozen. Also, a lot of frost was on the lid and walls of the super. The good news was that all the colonies were alive, so with hope and our fingers crossed, the bees will continue to survive through the usual death month of February.

Again this year, we have plans to teach a BCPA certified Introductory Beekeeping class in Cranbrook, to be held at the end of February, with the field day in May. Several enquiries have come from the local elementary schools wanting us to give a talk to their students on honey bees. For over 20 years it has never been a problem bringing live bees in an observation hive into the classroom. However, all the talk and literature about liability, risk, and insurance has us thinking of not

taking the bees in with us this year.

We plan on being part of an order for queens this spring but a final decision on how many we want or need will have to be the usual guess and gamble game. At over \$40 a queen it's always nice to not be short, or to have extra queens hoping someone else needs them.



South Vancouver Island
~ Paul Petersen

I'm not going to whinge about the weather but suffice it to say it's more normal. Jan 1st was about 12°C here in Cowichan and I got to check the bees. Got a sting too, so the withdrawal symptoms have abated. We did get a bit of snow and some cold temperatures for a few days but on the coast that

doesn't last very long, as the rain comes and washes it away. This year saw record rainfall here on the coast, 900 mm in one day recently. Overcast rainy weather brings with it very mild temperatures. Good for the bees as they consume less stores.

This time of year is just grand. The bees are flying, the new beeks are enquiring. I've spoken with a large portion of clubs here on the island and they are in tune to provide some advice for new and old members through meetings, field days and the like. There have been winter losses but for the most part these losses have not been very severe. I hope this is the case throughout BC.

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West Kootenays

~ Tom Bell

The club had a candle making social at Christmas which was greatly enjoyed and well attended. We followed that up in January and the first of February with presentations and discussions with Kate and Ryan of Elk Root Conservation Farm. They are managing their farm with intensive plantings of pollinator friendly plants and planting systems including a focus on increasing pollen and nectar sources later in the summer and early fall. They have also completed the construction of a bee barn and will use it for practical research and management for winter survival, disease management, and early spring start up among other objectives. Great discussions and we will follow up this summer with a field day – lots for all of us to think about.

The winter has overall been mild, wetter than usual, with a 10 day cold snap in early January – it seems like a good winter for the bees so far. We should start seeing some flights in February, and the anticipation is beginning to build for the spring season. The snow pack for the West Kootenays was 136% of normal in mid January - good news for bees as we had a dry fall and can use the extra moisture for next spring and summer. Axel Krause and Selkirk College in Castlegar are once again offering a beginner's beekeeper course and it has 30 students booked into the first classroom session, nice to see.

Castle Theatre in Castlegar has been running a once a

month "bee" movie event – the next one will be Honeyland which was nominated for an Oscar recently and takes place in Northern Macedonia - we have bee culture happening here!



South Okanagan

- Blair Tarves

It's February 5 and we just experienced a severe and unusual January cold snap in Keremeos, -20 for a week with high winds. The rest of the Okanagan was cold, but not that low. Then it warmed up to normal temperatures. (I can see the eyes rolling of beekeepers who live where it actually is cold every winter, and for a longer time.) Anyway for us it was cold, and I was very worried about some nucs and singles. When the bees were checked we had only lost 1.2% of 375 colonies. There is still the rest of February and early March to get through, but so far I'm happy (and surprised a bit) by the overwintering results. When bees die we can usually figure out the reasons, but when they survive it's almost more mysterious. What did we do right? How much luck was involved?

Others in our area have so far also had pretty good results. One fellow lost a lot of nucs in November, but he knew that they were a gamble in September and wasn't surprised. Another couple did something I would never have thought of doing. In January, before the cold snap, they fed light hives a thick syrup using hive top pail feeders - with excellent results. Cold weather in January is much less malign than in February. Let's hope we've seen the last of it.



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While I write this there is an *Apis trigona* hovering over my tea cup. I'm spending 3 months in Chile and Mexico this winter. In Chile in December I was looking for queens to import into Canada this coming April. I met many queen producers, and I'll be experimentally bringing in 500 queens from one of them. In Mexico I'm mostly in the Yucatán helping with 2 bee projects involving Africanized bees and the Mayan stingless bees - a species of *Trigona* is one of them.

Here's a few observations and experiences that may be interesting: Most of the arable land of Chile is intensively farmed, and it is in the 10th year of a severe drought. The drought has been exacerbated by the privatization of water rights. Some small farms and vineyards are being wiped out. Some rural communities are without drinking water and must truck it in. Millions of gallons of water running off the Andes is being diverted to huge, thirsty avocado orchards, and there is resentment felt towards the green gold. Thousands of cattle and horses have died, and the condors (basically a giant vulture) are waxing fat.

This is in the north of the central valley. Beekeepers there, if they can, are moving their bees south for a honey flow and to keep them alive. One queen breeding friend has been feeding her bees since October. Of course this is all happening against a background of a simmering revolution and a dropping peso.

The bees in Chile are mostly what they call carnica. I don't know enough about bee races to judge. There's certainly a lot of black queens. Colony defensive behaviour ranges from extremely docile to aggressive. Beekeeper behaviour is similarly varied. Smoke is used sparingly and sometimes not at all. At one operation I asked for a smoker, and the beekeeper obliged and went into his house to find one. When he returned he handed me a relic that had been his grandfather's, and hadn't been lit for years.

This is nothing like working Africanized bees in southern Mexico. Actually you don't work them, you force your will

on them. Usually there are two people: one uses the smoker almost continuously while the other does the beekeeping. One day I had 2 people smoking while I worked one hive - a single. This hive was on an island in a mangrove swamp that we had to kayak to, past crocodiles and thousands of migratory birds. The Africanized hives here are isolated as much as possible from people.

Later over lunch and a beer with my friend Oracio, we started talking about what a cool idea this experience would be for a tour. Africanized Bees! Kayaking! Crocodiles! I mentioned the idea to a few friends, one of whom is a tour operator, for their opinion. They all thought the idea was nuts, even the cave diving guide.

Some people just don't know what fun is.

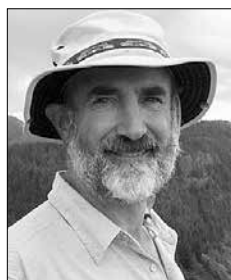


Fraser Valley
~ Courtney White

Happy New Year! I hope everyone and their bees have been staying cozy this winter. Down in the Fraser Valley the first signs of spring (crocuses popping up in late January) were squashed by another bit of snow. So far, winter mortality rates seem to be low and beekeepers are feeling much more

optimistic than they did at this time last year.

As you may have heard, Iotron recently changed the way it processes bee equipment. They will no longer have a "bee day" for small beekeepers, and now require a minimum order of \$750 or 125 boxes for treatment. This has left the local clubs scrambling to provide access to Iotron for hobbyists. In other news the Langley Bee Club is busy preparing for the 2020 AGM in October and is super excited to be the hosting club for the 100th year anniversary of the BCHPA!

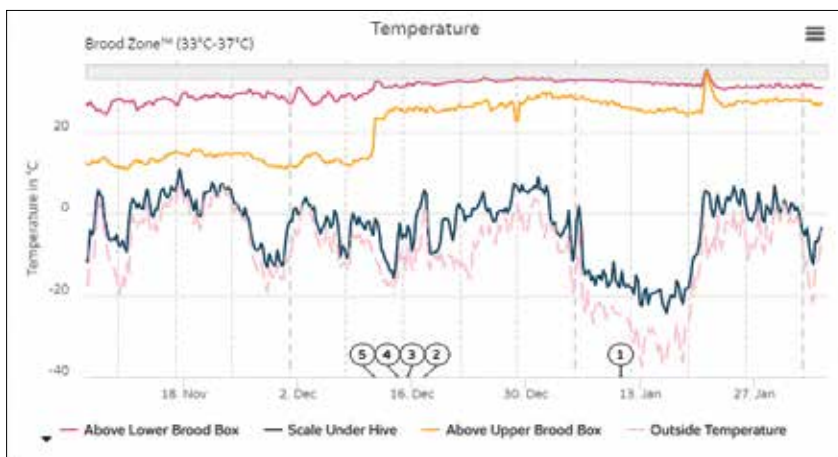


Peace Region
~ Kerry Clark

OK! No generalization, speculation or griping about the winter: at last I have a concise, quantitative description of the season since our

AGM in Prince George.

Temperatures here in the Peace have been unremarkably mostly below freezing, with a 2 week cold spell down to -40 in mid January. The graph shows that my location up on the ridge above Dawson Creek (and partly inside a winter wrap) is warmer by 5 to 15°C than the valley bottom where the cold air pools. The top 2 lines show the astounding (to me) ability of a bee colony to generate heat (+33°C even when outside it is bitterly cold). The cost of course is fuel: some hives lose weight at 5 kg a week in such conditions. Knowing the weight day to day can make a beekeeper fret: "at this rate, will they run out of food before I can supplement them? Maybe I should have given them an extra 10 kg in September." We still have 2 months



or more when we could get bitter cold. Do they still have 10 weeks of food, or 6? It's still too soon to know how colony winter survival has been, and a "polar vortex" swoop of arctic temperatures could still happen. We'll hope for the best, take what we get and do what we can to have a successful year. I look forward to our BCHPA March meeting in Kamloops. Best Wishes to all and I hope to see many of you then. Keep warm. ❁

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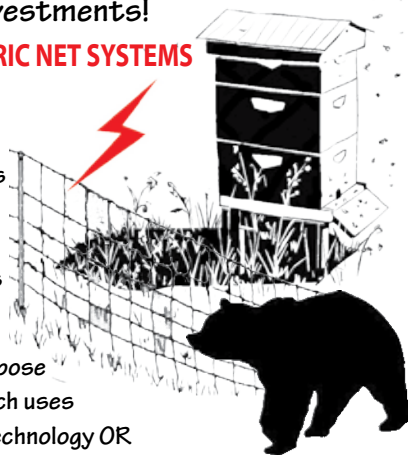


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