Fall 2019 | Vol 32 # 4

Hive Lights

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The Official Magazine of the Canadian Honey Council, The Canadian Beekeeper and The Canadian Honey Packer

Looking Back at our Apimondia Montréal 2019!

CAPA Statement on Honey Bee Wintering Loses in Canada (2019)

Timothy Wendell Brings Home Gold for Canada

International Honey Market

$4.95

Hivelights: The official magazine of the Canadian Honey Council, The Canadian Beekeeper and The Canadian Honey Packer.

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Hivelights is published quarterly (Spring, Summer, Fall, Winter). Deadline for submissions and adverts are 6 weeks prior to publication (i.e. Dec 15th for the Winter issue). The opinions expressed in the articles printed in Hivelights are those of the authors and do not imply endorsement of the Canadian Honey Council for the promotion of any product, goods or services mentioned unless specifically stated.

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Publication Mail Agreement number
43070512
ISSN 1489-730X
Return undeliverable Canadian addresses to
Hivelights
PO Box 914, Station T Calgary,
Alberta T2H 2H4
geoff@honeycouncil.ca
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HiveIrghts

Fall 2019 Vol 32 #4

Funded by the Government of Canada | Canada

Cover picture - Pierre, the Canadian Honey Council 's mascot welcomes everyone to the 46th APIMONDIA

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Design and Production ..... **Cristian Campean**
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>
> **Nick S. (1,000 colonies, New York)**

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Canadian Honey Council Report

Rod Scarlett, Executive Director, CHC

Despite an awful summer throughout most of Canada, particularly for honey production, it was a busy summer for the CHC. Two major events were happening concurrently; Apimondia 2019 in Montreal and the reintroduction of fumagilin -b. I am pleased to say that both occurred without a major interruption. To begin with, I would like to extent a congratulations to Vita Bee Health, Max Watkins, and Sebastian Owen for facilitating the production of fumagilin–b in Canada and getting it out to Canadian beekeepers in a very tight timeline. It was their hard work and investment that ensured Canadian beekeepers have access to a product that was desperately needed. I would be remiss in also not thanking Medhat Nasr for seeing this project through to its conclusion. The officials at Health Canada were exceedingly helpful and saw fit to fast-track some of the necessary regulatory requirements recognizing the emergency type situation that was facing the industry. Finally, I think the Board of the Canadian Honey Council should be congratulated for having the foresight and willingness to go the extra mile to ensure fumagilin -b remained a Canadian product in the toolkit of beekeepers.

The Apimondia Congress in Montreal in early September was a success as about 5500 participants attended. After four years of preparatory work, workshops, scientific sessions, tours, contests, and a world class trade show went off without any major complications. While there are numerous volunteers who contributed to the success, but I need to point out a few. A special thanks goes out to my friend and working colleague for the last four years, Pierre Giovenazzo whose optimism and work ethic was inspirational. To Dr. Stephen Pernal for successfully managing a scientific program that was second to none. To Dr. Cynthia Scott-Dupree for taking on the management of all the workshops, to Melissa Gerard for coordinating all the honey contest entries and to Julie Ferland for volunteering to look after volunteers. I know that there are many more who need to be thanked and I assure you I will get around to it.

Perhaps the most controversial component of Apimondia was the World Bee Awards and in particular, the honey contests. There were 157 honey samples sent for lab and Nuclear Magnetic Resonance (NMR) testing and of those 71 failed. Apimondia officials, who managed the contest, decided not to publicly announce either the reasons for disqualification nor identify who was disqualified. While adulterated honey is a world wide problem, it has had significant impact on Canadian producers as it has downgraded pricing and has thrown doubt on the authenticity and quality of Canadian honey. Withholding information does not help in addressing the issue. What I can tell you is that nearly 15% of the samples were found to be adulterated, 6% failed as a result of antimicrobial residues and 10% because of physiochemistry (HMF, moisture, diastase). The remaining were a combination of the three with multiple infractions. It should be noted that no continent was exemplary and negative results were widespread. What does all this mean? To me it says there are a multitude of problems out there and there is no quick fix that addresses all the problems. NMR testing is just another tool, but it also needs other testing to remain effective. Beekeepers worldwide need to understand the use of antibiotics and residues and they need to understand the implications of the environment, production, and manufacturing of their product. Lots of issues and not a lot of answers ---yet.

For many Canadian beekeepers, this year has been disastrous. The CHC will be working on ways to help. It is a complicated issue that probably requires a multi-pronged approach. Your suggestions and input will help, so please do not hesitate to contact your respective Director or give me a call. ■


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Regional Reports

Maritimes

Mario Swinkels

Apimondia 2019 was a success, it was wonderful to see a good contingent from Atlantic Canada especially Newfoundland. It was good to see new and friendly faces. As well I enjoyed the many conversations with people from other parts of the world on how their beekeeping differed from ours. Everyone left tired but happy after so many days of new experiences. It was a very hard time of year for anyone in Atlantic Canada (or any part of Canada) to be leaving their bees behind with so much work to be done, but those of us that did so, will have lasting memories once the backlog of work is done.

Most of Atlantic Canada has had a below average honey crop for 2019 but final numbers will not be seen until the New Year. Even with the lower honey crop bees look good going into winter and a late honey flow will add to their strength. Hopefully everyone has done their mite checks and we will see strong hives in the spring.

As the winter sets in it's a good time to check for your local AGM dates, Atlantic Canadian beekeeping associations have most of the AGM's scheduled for the late winter months but this is a good time to contact your local associations to have some input into what is being planned.

Québec

Scott Plante

As this is being written we are October 3rd and most beekeepers are into feeding their hives for winter. With heavy losses being felt again this spring, and all the splitting done to recuperate those losses there seems to be very little varroa mites in the hives this fall.

It seems that Canada as a whole has seen a small honey crop this year. I would like to invite you all to fill in any survey sent out by your provincial apiarists. Those surveys will give us concrete numbers on what is going on. It's the only way we can move forward as an industry when addressing this issue.

I would like to thank all involved in Apimondia 2019. Especially Rod, Pierre and Steve without which this event would not have been a success. We will cover the event in our future issue.

In April 2018 the Honey Council had entered into talks with Medivet's owners to ensure that the continued supply of Fumagillin be re-established. I am pleased to announce that after a lot of negotiations, Fumagillin is available for use this fall. The product is available through the BeeMaid Bee supply store.

Canadian honey, as I have no doubt you are already aware, is a quality product and it should fetch a quality price. To this effect, we are looking to expand the presence of Canadian honey on the world market. We have applied for an Agrimarketing grant to participate in the following food shows for 2020;

- March 10-13 2020 FoodEx, Chiba, Japan
- April 15 -17 2020 SIAL Montreal, Canada at the Palais des Congres
- May 13-15 2020 SIAL Shanghai China Shanghai
- December 2020 SIAL Middle East Abu Dhabi UAE.

……..

Au moment d'écrire ces lignes, nous sommes le 3 octobre et la plupart des apiculteurs du Québec nourrissent leurs ruches pour l'hiver. Avec de lourdes pertes qui se sont de nouveau fait sentir ce printemps, et toute les divisions faites pour récupérer ces pertes, il semble y avoir très peu de varroas dans les ruches cet automne.

A première vue on dirait que le Canada dans son ensemble ait connu une petite récolte de miel cette année. J'aimerais vous inviter tous à remplir tout sondage envoyé par vos apiculteurs provinciaux. Ces sondages nous donneront des chiffres concrets sur ce qui se passe. C'est la seule façon pour l'industrie d'aller de l'avant dans ce dossier.

Je tiens à remercier tous ceux qui ont participé à Apimondia 2019. Surtout Rod, Pierre et Steve sans qui cet événement n'aurait pas été un succès. Nous couvrirons l'événement dans notre prochain numéro.

En avril 2018, le Conseil du miel avait entamé des pourparlers avec les propriétaires de Medivet pour s'assurer que l'approvisionnement continu du Fumagillin soit rétabli. Je suis heureux d'annoncer qu'après de nombreuses négociations, le Fumagillin est disponible pour utilisation cet automne. Le produit est disponible dans le magasin de matériel apicole BeeMaid.

Le miel canadien, comme vous le savez sans doute déjà, est un produit de qualité et il devrait rapporter un bon prix. À cet effet, nous cherchons à accroître la présence du miel canadien sur le marché mondial. Nous avons fait une demande de subvention Agrimarketing pour participer aux salons alimentaires suivants pour 2020 ;

- 10-13 mars 2020 FoodEx, Chiba, Japon
- 15 -17 avril 2020 SIAL Montréal, Canada au Palais des Congrès
- 13-15 mai 2020 SIAL Shanghai Chine Shanghai Shanghai
- Décembre 2020 SIAL Moyen-Orient Abu Dhabi EAU.

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Ontario

Albert Devries

Apimondia Montreal 2019 is over. It was a great success. Over 5000 beekeepers from around the world gathered together for five days in Montreal. So many people gave their time and worked hard to make Apimondia a success. I would like to highlight the work of Steve, Pierre and Rod. They planned a world-class event and made Canada look good. Another notable contribution was made by the spouses of delegates that were able to attend. Cheryl, Cindi, Cheryl and Janine pitched in where needed and accomplished so much. I am thankful that I was able to meet these wonderful people. Apimondia 2021 in Russia is an event to consider for Canadian beekeepers.

Looking at the current season in Ontario, some beekeepers have a near average crop while most are below. Many beekeepers are still extracting the last boxes as I write this report. The Niagara region, however, has had an exceptionally good year. It is nice to hear this when you understand they had hives starving in May because it was still so cold. There was very little for bees to forage and limited time the bees could fly. High yields demonstrate a remarkable turnaround.

Ontario beekeepers received good news when the Ontario Government announced aid available for beekeepers with ten or more registered hives. The amount of $500 000 has been allocated for this program. The conditions for receiving funding are fairly broad and I expect the demand will be greater than the funds made available.

Finally, the OBA is having its fall meeting and AGM in Burlington on November 15 and 16. This is sure to be a well-attended event with great content for beekeepers. I look forward to seeing many of you there. It is a privilege to represent Ontario and be a part of the Canadian Honey Council.

Saskatchewan

Jake Berg

Apimondia was a great success!! Even though Rod has been avoiding taking any credit for the huge success of Apimondia 2019, it wouldn't have been possible without his dedication and tireless effort. Thanks Rod!!

Saskatchewan's booth, in the APExpo, was very busy and when our friendly pet bear, Pierre, came out to visit, many attendees wanted to see him. Young and old, men, woman and children all wanted hugs and photos with our friendly mascot. Pierre was well received at the Expo which was a wonderful surprise for the Saskatchewan volunteers/beekeepers as it gave them an opportunity to hand out the honey sample with the SBDC information card.

Congratulations to Timothy Wendell, Wendell Estate Honey, for bringing home a gold metal from the World Beekeeping Awards. Tim won gold for his entry of Class 20 Soft Set Honey. There were 11 entries total and two Canadians won in this category, with bronze going to a beekeeper in B.C. Congratulations again Tim!!

Apimondia was an excellent experience. It allowed us to meet beekeepers from around the globe, exchange ideas and beekeeping practises, and learn how beekeepers from other parts of the world operate their colonies. I hope to see Apimondia come back to Canada at some point in my beekeeping career.

Alberta

Neil Specht

APIMONDIA was a successful from all reports. The contests were challenging and will grow from the experience. My take home is that APIMONDIA will need to move to an improved relationship with Agriculture. Thanks and kudos to Rod, Pierre and Steve. There should be more in this issue. My take home was winter queen banking experiments look promising. But I didn't get to see much of anything as we were kept busy.

Sweetheart Pollinators was happy to make our average crop with strong pollination in a less than average year. I'm hearing 80% of avenger in Saskatchewan and many less than 60% in honey belt of Alberta. We did a Pettis test on a few high mite load Colonies. We are starting to see resistance to Apivar, still good but keep an eye out. Last I'm hearing strong bees going into winter. Hope to see many of you and hear more at conventions and IPM.

British Columbia

Stan Reist

Apimondia has come and gone, it was an amazing 7 days. The world beekeeping awards was quite amazing, the amount of work needed to display the products, and protect the displays once they were displayed was a challenge. Look but don't touch. I would think that is an easy concept but evidently not. We stayed at the Weston right across from the event. While the hotel was quite nice, they could have at least put a happy face on the brick wall of the adjoining building. Every day same bricks, boring, probably a few other gestures as well anything, to break up the blank wall.

There is a report from AIM, the professional group responsible for the production of Apimondia, which can be viewed on the computer and elsewhere but here are some of the details.

Over 5,000 registered participants, 100 Speakers from 25 countries, 4 Keynote Lectures, 940 submitted Abstracts, 9 Workshops with more than 1000 participants, 4,500 apiexpo SQM – 241 Exhibiting companies 7 Technical tours with more than 500 participants, more than 400 WBA entries. These are some of the stats being released now and final numbers will be made available at a later date.

The honey crop in B.C. is somewhat all over the show this year from 400 lbs. in the Peace River region on the B.C. side to nothing on various other spots like the sunshine coast, and on Vancouver Island. The pacific side did really well and some western inland regions. Above Campbell River out at Sayward it was a very early crop but good and the east side of the island was really poor. Now if you were a townie you did not too bad as there was lots of watering in the cities and towns.

Our AGM is this weekend in Prince George, and we have a great lineup of speakers, and sponsors for the event. Karen Pederson, Pederson apiaries Cut Knife Sask. About her families beekeeping operation. Ian Steppler Manitoba commercial beekeeper. Talks on running single brood boxes, and what he wished he knew when he stared beekeeping. Medhat Nasr, retired Alberta provincial Apiculturist, Presentation on 50 years of beekeeping bee pest and disease management. Kathleen Suddes Roberts's creek Honey. Beekeeping on the sunshine coast. Sarah Red-Laird, founder and executive Director Bee Girl Organization. Regenerative bee pasture and teach kids about bees. Ami-

na Harris, Director, Honey and pollination Center UC DVIS Tasting and evaluating Honey flavors. Dr. Stephen Pernal Research Scientist apiculture and office in charge Beaverlodge research Farm. Julia Common chief beekeeper, Hives for Humanity. Colony stress and successful overwintering 4 frame Nucs. Kirsten Traynor Bee researcher university of Maryland. Fungicides and Queen Fertility, and European intensive hive management. We have a great line up of presenters and it will prove to be a resounding success. In the heart of B.C.

Bernie Rousseau

BeeMaid

Apimondia 2019 - Shannon Bowden

The Palais du Congress Montreal was abuzz with beekeepers during Apimondia 2019 that took place from September 8-12. Bee Maid Honey was a proud Gold Sponsor and the organization was thrilled to be part of such a world-class event. Beekeepers from across the world converged to network, attend workshops, technical tours and symposiums and to visit vendors at the Expo.

The program was bursting with an endless array of symposiums presented by experts in their fields, covering key areas like economy, biology, bee health, pollination, technology, apitherapy, beekeeping development and cross cutting. It must have been difficult for delegates to plan their day with all the interesting topics of discussion.

The ApiExpo was where the Bee Maid staff spent the majority of their time. With a prime booth space, they were well situated to visit with beekeeping friends from all corners of the earth. The Bee Supplies Managers were certainly busy as Bee Supplies customers, suppliers, Members and potential suppliers were eager to meet them in person.

Their eye-catching booth was also a pit stop for many of Bee Maid Cooperative Members who were attending the congress. It was great to see so many Canadian beekeepers attending Apimondia.

All Bee Maid staff in attendance were very grateful to be part of such a unique and exciting event!

Timothy Wendell brings home gold for Canada

Jake Berg

Congratulations to Timothy Wendell, Wendell Estate Honey, for bringing home a gold metal from the World Beekeeping Awards. Tim won gold for his entry of Class 20 Soft Set Honey. There were 11 entries total and two Canadians won in this category, with bronze going to a beekeeper in B.C. Congratulations again Tim!!

Looking back at our Apimondia Montréal 2019

Pierre Giovenazzo

What a great experience! It all started in 2015 when we made our bid in Daejon, South Korea to host the 46th Apimondia in Montréal. I sincerely hope that all Canadian and international attendees appreciated travelling to beautiful Montréal and participating in the various activities of our Apimondia Montréal 2019.

From Sunday, September 8 to Friday, September 13, the City of Montréal and its wonderful Palais des congrès was "buzzing" with beekeepers and beekeeping stakeholders from around the world. There were near 6000 participants from 134 countries. Our spectacular 5,250 SQM ApiExpo staged 241 companies and the World Bee Awards. Our outstanding scientific program lasted 4 days, in 4 main rooms with simultaneous translation French/English/Spanish in the main room. Our educational workshops and the technical tours were very popular with over 2000 participants. We can be very proud: our Canadian beekeeping industry hosted a very successful Apimondia Montréal 2019!

There were so many highlights during the Apimondia week and I wish to outline just a few. The opening ceremony presented a mixture of Canadian beekeeping with a twist of history from our indigenous culture. The "Jerry Cans" from Nunavut marked the beginning of our congress with traditional Inuit throat signing that touched our imagination and showed the vastness of Canada. ApiExpo 2019 was, without any doubt, the greatest ever seen at any Apimondia. It was very colourful, fun to walk though, and a great opportunity to see the immense diversity of the world beekeeping industry. Dr. Steve Pernal organized a spectacular scientific program. The variety of topics, the high quality of the keynote speakers, the oral presentations (320) and the posters (363) were exceptional. The Canadian beekeeping symposia where the highlight for beekeepers from around the world who came to learn about our industry. Our novel educational program was remarkable, each course was at maximum capacity and all received laudatory comments from students. We are sure that educational programs will become part of future Apimondia congresses. Each morning, 1500 participants entered the main room, to listen attentively to the keynote speaker. This set the tone of each day: a continuous "buzz" of scientific activity at the Palais des congrès from 8 am to 9 pm! "Too many good presentations at the same time" was the usual comment!

This great world beekeeping celebration that we hosted in Montréal, Canada, was the result of many years of hard work and a tremendous team effort. The Canadian Honey Council (CHC) was the official host of Apimondia Montréal 2019 and the CHC board members were the soul of the event. They were provided kind and strong support to the backbone of the local organizing committee composed of Rod Scarlett, Steve Pernal and me. One of our best decisions was to hire a professional congress organizer, AIM group from Rome, Italy. With their expertise, we built the foundations of our congress and AIM was instrumental in managing all the logistics. As the congress approached many people helped us generously: Melissa Girard managed the World Bee Awards honey samples, Cynthia Scott-Dupree coordinated the workshops, Marilène Paillard coordinated the technical tours and Julie Ferland coordinated the volunteers. Their help was precious and I thank them for their excellent work. I also wish to point out that Steve Pernal recruited 28 scientific specialists to evaluate the submitted abstracts. Many of these scientists are members of the Canadian Association of Professional Apiculturists (CAPA). CAPA has supported the CHC since the beginning of our Apimondia Montréal 2019 venture and special thanks goes to all CAPA members.

Finally, I wish to thank Marienza Margulio (AIM group) for her kindness and her unlimited availability to help us in all aspects of the congress. Many thanks to Steve Pernal, a bright mind and a very kind and generous person. And special thanks to Rod Scarlett, an outstanding organizer who worked his heart out to make everything perfect.

The next Apimondia will be in Ufa Russia, so put this now in your agenda! I wish our Russian friends great success with their 47th Apimondia Ufa 2021. ■

Canadian Association of Professional Apiculturists

Statement on Honey Bee Wintering Losses in Canada (2019)

Prepared by CAPA National Survey Committee and Provincial Apiculturists: Julie Ferland (chair), Melanie Kempers, Karen Kennedy, Paul Kozak, Rhéal Lafrenière, Chris Maund, Cameron Menzies, Samantha Muirhead, Medhat Nasr, Steve Pernal, Jason Sproule, Paul van Westendorp and Geoff Wilson

Summary

The Canadian Association of Professional Apiculturists (CAPA) coordinated the annual honey bee wintering loss report for 2018-2019. As in previous years, the survey consisted of harmonized questions based on the national beekeeping industry and the Provincial Apiculturists collected the survey data. All provinces were included in the national survey. The respondents operated 398,728 honey bee colonies across Canada. This represents 50% of all colonies operated and wintered in the country in 2018-2019. The national winter loss, including non-viable bee colonies was 25.7% with provincial losses ranging from 19.8% to 54.1%. The overall national colony loss reported in 2019 is in the middle range of reported losses since 2007. Through the hard work of beekeepers replacing loses and making increases, Statistics Canada reports show that the total colony count has increased by 35.2% during the period between 2007 and 2018.

Respondents reported some variation in identifying and ranking the top four possible causes of colony losses across the country. The most frequently cited causes in order from high to low were: weather, starvation, poor queens, and weak colonies in the fall.

Beekeepers also responded to questions on the management of three serious parasites and pathogens to beekeeping: Varroa mites, Nosema spp. and Peanibacillus larvae (the causal bacteria of American foulbrood disease). The majority of beekeepers in most provinces reported that they monitored for Varroa mites. The most commonly reported Varroa treatments were Apivar® and formic acid (Mite Away Quick Strip® (MAQS), repeated 40 ml of 65% formic acid treatments or flash treatments) in spring, Apivar® or formic acid (MAQS or flash treatments) in the summer or fall and oxalic acid in late fall. Many beekeepers reported using spring and fall applications of Apivar® or Apivar® plus formic or oxalic acid to keep mites under control in 2018. Nosemosis and American foulbrood were treated by many Canadian beekeepers. Across the country registered antibiotics were the commonly used treatments; but methods and timing of application varied from province to province.

Provincial Apiculturists, Tech-transfer agents and researchers have been working with beekeepers across Canada to encourage them to monitor honey bee pests, especially Varroa mites and nosema, and adopt recommended integrated pest management practices to keep these pests under control. Through various working groups, that include various stakeholders, CAPA members continue to work on development and improving management options for beekeepers to keep healthy bees. CAPA members are also actively involved in the Federal Bee Health Roundtable to develop strategies that work toward addressing risks and opportunities for developing a sustainable, healthy beekeeping industry.

Disclaimer: Survey data were supplied by the provincial apiarist of each province. The data were then compiled and further analyzed by the CAPA National Survey Committee.

Introduction

For over a decade, many countries, including Canada, have surveyed beekeepers and reported overwintering mortality of honey bee colonies and management practices used for Varroa mites, nosema and American foulbrood. The Canadian Association of Professional Apiculturists (CAPA) has worked with the Provincial Apiculturists to report on wintering losses of honey bee colonies and possible causes of bee mortality in Canada since 2007. The objective of this national report is to consolidate provincial honey bee losses across the country based on data collected through harmonized survey questions. The possible causes of winter loss, as reported by beekeepers and information on pest surveillance and control are surveyed and included in this report. The survey results aid in identifying gaps in current management systems, developing strategies to mitigate colony losses and improving bee health, biosecurity practices, and industry sustainability.

Methodology

In 2019, the Provincial Apiculturists and the CAPA National Survey Committee members reviewed the questions used in the 2018 survey and made necessary revisions. Examples of these revisions include new treatments or new strategies for beekeepers to manage pests and diseases as they are developed over the years. The result was an updated harmonized set of questions that was used in the 2019 survey (Appendix A). These questions took into account the large diversity of beekeeping industry profiles, management practices and seasonal activities within each province. Some provinces also included supplementary regional questions in their provincial questionnaire. Results of these regional questions are not included in this report but it can be accessed by contacting the Provincial Apiculturist of the province in question (Appendix B).

Commercial beekeepers and sideliners that owned and operated a specified minimum number of colonies (Table 1) were included in the survey. The survey reported data from full-sized producing honey bee colonies that were wintered in Canada, but not nucleus colonies. Thus, the information gathered provides a valid assessment of honey bee losses and management practices.

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The common definitions of a honey bee colony and a commercially viable honey bee colony in spring were standardized as follows:

• Honey Bee Colony: A full-sized honey bee colony either in a single or double brood chamber, not including nucleus colonies (splits).

• Viable Honey Bee Colony in Spring: A honey bee colony that survived winter, with a minimum of 4 frames with 75% of the comb area covered with bees on both sides on May 1st (British Columbia), May 15th (New Brunswick, Nova Scotia, Ontario, Prince-Edward-Island and Quebec) or May 21st (Alberta, Manitoba, and Saskatchewan).

The colony loss and management questionnaire was provided to producers using various methods of delivery including mail, email, an online and a telephone survey; the method of delivery varied by jurisdiction (Table 1). In each province, data were collected and analyzed by the Provincial Apiculturist. All reported provincial results were then analyzed and summarized at the national level. The national percent of winter loss was calculated as follows:

$$\text{Percentage Winter Loss} = \left(\frac{\text{Sum of the estimated total colony losses per province in spring 2019}}{\text{Sum of total colonies in operation in each province for 2018}}\right) \times 100$$

Results

Throughout Canada, a total of 536 sideline and commercial beekeepers responded to the 2019 survey. These respondents represented 44% of the all surveyed targeted beekeepers. They operated nearly 50% of all registered colonies that were put into winter in 2018. Although the number of reported colonies is down from 46.6% of beekeepers responding representing 63.9% of bees in Canada in the 2018 survey, the participation rate and representation of the industry can still be considered to be good.

The survey delivery methods, operation size of surveyed beekeepers, and response rate of beekeepers in each province are presented in Table 1. It is important to note that the total number of colonies operated in a province reported in this survey may vary from the Statistics Canada official numbers. In some provinces the data collection periods for the provincial database and the Statistics Canada numbers are at different times of the year. This can result in minor discrepancies between the official Statistics Canada total number of colonies and this surveys total reported colonies per province.

Survey results showed that the national level of wintering loss including nonviable colonies was 25.7% with individual provincial percentage ranging from 19.8% to 54.1%. The overall winter loss percentage for 2018-2019 was lower than 2017-2018 which had a loss rate of 32.6%. The level of winter loss varied from province to province, and among beekeeping operations within each province. In general, most provinces reported lower mortality in 2018-2019 than the previous year, the exception being Nova Scotia reporting similar mortality to last year and Prince Edward Island and Newfoundland/Labrador reporting higher mortality than last year. Prince Edward Island reported the highest winter losses of 54.1% in 2019 with weather cited as being the most frequent cause contributing to colony mortality. The lowest winter loss (19.8%) was reported by Nova Scotia again this year.

Overall 72% of the colonies owned by respondents were wintered outdoors in fall 2018. The rest of the colonies (28%) were wintered

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Table 1: Survey parameters and honey bee colony mortality by province

Province	Total number of colonies operated in 2018	Estimated number of colony lost based on the estimated provincial winter loss	Type of data collection	Number of beekeepers targeted by survey	Number of respondents (% of participation)	Size of beekeeping operations targeted by survey	Number of respondents' colonies that were wintered in fall 2018	Number of respondents' colonies that were alive and viable in spring 2019	Percentage of surveyed colonies to the total number of colonies in the province	Provincial Winter Loss including Non-viable Colonies
Newfoundland and Labrador	425	127	Email, Telephone, Text message	9	9 (100%)	20 col. and more	426	299	100%	**29.8%**
Prince Edward Island	6 000	3 246	Email, Telephone	50	17 (34%)	All sizes	5 330	2 448	89%	**54.1%**
Nova Scotia	25 210	4 992	Email	41	20 (49%)	50 col. and more	16 058	12 877	64%	**19.8%**
New Brunswick	11 998	3 155	Email, Telephone, Postal	30	16 (53%)	50 col. and more	8 628	6 360	72%	**26.3%**
Quebec	65 128	16 282	Email, Telephone, Postal	137	108 (79%)	50 col. and more	50 198	37 669	77%	**25.0%**
Ontario	100 413	22 693	Email, Telephone, Postal, Online	218	87 (40%)	50 col. and more	48 418	37 469	48%	**22.6%**
Manitoba	114 098	24 417	Email	112	34 (30%)	100 col. and more	46 091	36 249	40%	**21.4%**
Saskatchewan	114 000	24 396	Online	120	47 (39%)	100 col. and more	47 087	36 999	41%	**21.4%**
Alberta	311 374	89 676	Online	111	43 (39%)	400 col. and more	121 786	86 680	39%	**28.8%**
British Columbia	54 706	17 451	Online	403	155 (39%)	10 col. and more	54 706	37 242	100%	**31.9%**
Canada	**803 352**	**206 435**		**1231**	**536 (44%)**		**398 728**	**294 292**	**50%**	**25.7%**

indoors (Table 2). The highest percentage of bee colonies wintered indoors was in Nova Scotia (75%), followed by Quebec (66%) and New-Brunswick (60%). The mortality rate for colonies wintered outdoors and indoors for each province is presented in Table 3. The mortality rate is calculated only for provinces where enough colonies are wintered indoors to have a fair representation of this wintering technique.

For detailed information about the winter losses in each province, please contact each province directly for a copy of its provincial report where available.

Table 2: Overwintering method by province

Province	Bee colonies owned by responding beekeepers wintered outdoors in fall 2018		Bee colonies owned by responding beekeepers wintered indoors in fall 2018	
	Number of colonies	Percent (%)	Number of colonies	Percent (%)
NFL	423	99	3	1
PEI	5 328	100	2	0
NS	3 958	25	12 100	75
NB	3 468	40	5 160	60
QC	16 916	34	32 982	66
ON	38 485	79	9 933	21
MB	28 139	61	17 952	39
SK	30 209	64	16 878	36
AB	105 771	87	16 015	13
BC	54 387	99	410	1
Canada	**287 084**	**72**	**111 435**	**28**

Table 3: Indoor and outdoor wintering mortality as reported by responding beekeepers

Province	Total number of colonies wintered **outdoors** in fall 2018	Total number of viable colonies wintered **outdoors** in spring 2019	Percent of losses of colonies wintered **outdoors** (%)	Total number of colonies wintered **indoors** in fall 2018	Total number of viable colonies wintered **indoors** in spring 2019	Percent losses of colonies wintered **indoors** (%)
NFL	423	295	30.3	3	3	N/A
PEI	5 328	2 447	54.1	2	1	N/A
NS	3 958	3 310	16.4	12 100	9 567	20.9
NB	3 468	2 590	25.3	5 160	3 770	26.9
QC	16 916	11 670	31,0	32 982	25 762	21.9
ON	38 485	29 598	23.1	9 933	7 871	20.8
MB	28 139	22 115	21.4	17 952	14 134	21.3
SK	30 209	24 200	19.9	16 878	12 799	24.2
AB	105 771	76 969	27.2	16 015	9 711	39.4
BC	54 387	36 928	32.1	410	314	N/A
Canada	287 084	210 122	26.8	111 435	83 932	24.7

Contributing factors as cited by beekeepers

Beekeepers were asked to rank possible contributing factors to colony losses. These responses are summarized in Table 4. Weather was considered an important factor for winter loss across the country, likely reflecting the very long and cold winter in addition to the cold periods of weather well into April and May through many beekeeping areas. In six provinces, weather was considered the number one (five provinces) or number two (one province) factor contributing to reported winter losses. Similar to the previous year, beekeepers reported that a lot of bee colonies died in April and into early May.

Starvation was the second most reported cause of winterkill by beekeepers in several regions across Canada. Starvation can be the result from the inability of bees in weak colonies to store enough stored food during the fall, the inability of bees to move to new resources within the hive during winter, the rapid consumption of stored food because of early brood production, or insufficient feed provided by the beekeeper in the fall or spring. During the winter of 2018-2019, starvation may be associated with increased consumption of stored food during the long cold winter and extended cold through the spring.

Poor or failing queens were also another commonly cited as a cause of winter loss across Canada. Poor queens can result in weakened colonies entering the winter; this causes an insufficient number of bees in the colony to survive. If a queen fails or dies over the winter, the colony will die as well because there is no opportunity for the beekeeper to replace the queen and the bees cannot rear a new queen during the winter season. The poor and failing queens can be caused by many factors, including, inadequate rearing conditions, poor mating weather, age of the queen or exposure to pesticides in hive and in the environment. The recent increase of queens as a reported cause for winter mortality is a concern that should be investigated further.

Another contributing factor identified across Canada was weak colonies in the fall. This can be caused by a variety reasons including: making late splits (nuclei), underlying pest and disease issues, exposure to pesticides, or poor foraging and nutrition.

Ineffective Varroa control was reported as the third or fourth possible contributing factor to winter colony loss in only three provinces. While the Varroa mites and their impacts on the honey bee health are still a serious issue for Canadian beekeepers, reported survey results may indicate that most beekeepers are treating in a timely manner to keep mite populations under control. Many beekeepers across the country are relying on multiple Varroa treatments in a year as it better enables beekeepers to protect their bees in the winter. Unfortunately, some individual producers treated Varroa too late, which results in wintering bees being less healthy from the impacts of Varroa and associated viruses. These beekeepers often report winter mortality greater than 30% and frequently reported mites as a primary concern.

Several beekeepers in different provinces reported that they did not know why their colonies perished. Inability to identify a possible cause for colony mortality may be associated with lack of applying best management practices including monitoring for pests, diseases and other general colony health parameters during the season, or a multitude of underlying problems that cannot be identified without specialists.

Operations that reported higher than 25% winter loss were asked to rank the top four possible causes of bee colony mortality in the 2018-2019 survey. These data are summarized in Table 5. Weather, starvation and poor queens are still the 3 most cited causes of winter loss for these operations. Overall, there were no striking differences between reported causes of winter losses across the provinces and operations that reported 25% or more winter losses.

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Table 4: Top four ranked possible causes of honey bee colony mortality by province, as cited by beekeepers who responded to the 2018-2019 winter loss survey

Province	1st.	2nd.	3rd.	4th.
NL	Other (rodents)	Weak colonies in the fall	Weather	Starvation
PEI	Weather	Starvation	Ineffective Varroa control	Poor queens and Other (shrew predation)
NS	Weak colonies in the fall	Weather	Poor queens	Starvation
NB	Weather	Don't know	Poor queens	Starvation
QC	Weather	Starvation and Poor queens	Weak colonies in the fall	Ineffective Varroa control
ON	Starvation	Poor queens	Weather	Weak colonies in the fall
MB	Poor queens	Starvation	Weather	Weak colonies in the fall
SK	Starvation	Poor queens	Weather	Weak colonies in the fall
AB	Weather	Poor queens and Starvation	Ineffective Varroa control	N/A
BC	Weather	Weak colonies in the fall	Starvation	Poor queens

Table 5: Top four ranked possible causes of bee colony mortality by province, as cited by beekeepers who reported higher than 25% losses in the 2018-2019 winter loss survey

Province	1st.	2nd.	3rd.	4th.
NL	Other (rodents)	Other (trial experiment)	Weather	N/A
PEI	Weather	Starvation	Ineffective Varroa control	Other (shrew predation)
NS	Other (pygmy shrews) and Starvation	Weak colonies in the fall	Weather	Poor queens
NB	Poor queens	Don't know	Weather	Ineffective Varroa control
QC	Weather	Starvation	Ineffective Varroa control	Poor queens
ON	Weather	Starvation and Poor queens	Ineffective Varroa control and Nosema and Weak colonies in the fall	N/A
MB	Starvation	Weather	Poor queens	Don't know
SK	Starvation	Poor queens	Weather	Weak colonies in the fall
AB	Weather	Poor queens	Starvation and Ineffective Varroa control and Weak colonies in the fall	N/A
BC	Weather	Weak colonies in the fall	Starvation	Poor queens

Bee Pest Management Practices

In recent years, Integrated Pest Management (IPM) has become the most important practice to maintain healthy honey bees. To successfully manage bee health, beekeepers must identify and monitor pests and diseases to take timely action in accordance with approved methods. This survey focused on asking beekeepers questions about their management of three serious threats that may impact bee health, survivorship and productivity (Appendix A).

A. Varroa monitoring and control[1]

The Varroa mite continues to be considered by beekeepers and apiculture specialists as one of the main causes of honey bee colony mortality.

During the 2018 production season, a large majority of surveyed beekeepers monitored for Varroa mite infestations (Table 6). The alcohol wash of a sample of 300 bees per colony was the most preferred technique in all provinces, except Quebec where beekeepers favoured the use of sticky boards and British Columbia where beekeepers preferred the technique using icing sugar. The frequency of use for the alcohol wash technique in various provinces ranged from 22% to 81%. The frequency of use of the sticky board method ranged from 0% to 37%. Some beekeepers used both sticky boards and alcohol wash methods to evaluate the levels of mites. These results demonstrate that most Canadian beekeepers recognize the value of monitoring Varroa mites. The education and extension programs delivered to beekeepers in Canada have helped in adoption of recommended management practices for Varroa mites. The goal is to have all beekeepers actively monitoring Varroa mite populations to improve timing and selection of the best treatment options for Varroa mite control.

In Canada there are a variety of registered miticides available to beekeepers for mite control. Beekeepers are encouraged to use the most effective miticide that fits their region, season and operation. Beekeepers are encouraged to rotate miticides to prevent the development of resistance to these products. In the current survey of bee winter losses, beekeepers were asked "what chemical treatment was used for Varroa control during the 2018 season". The beekeepers' response is summarized in Table 6. In the spring of 2018, the percentage of beekeepers that treated with chemical methods ranged from 38% in New Brunswick to 100% in Saskatchewan. The main miticide used for spring Varroa control was Apivar® (a synthetic miticide with the active ingredient amitraz). The second most common treatment is formic acid in late spring, followed by oxalic acid. In fall of 2018, most Canadian beekeepers ranging from 67% in Alberta to 98% in Quebec treated their colonies for Varroa. The main miticides used at this time of the year were oxalic acid, Apivar® and formic acid. It was noted that some beekeepers used Apivar® twice in the same year in 2018, once in spring and again in fall. More and more beekeepers have started to combine Apivar® with formic or oxalic acid in the fall for keeping control of the mite population.

Few beekeepers used Apistan® (a synthetic miticide with the active ingredient fluvalinate) and Checkmite+® (a synthetic miticide with the active ingredient coumaphos). Beekeepers may be leery of these products because of previously reported resistance to these active ingredients in Canada.

Once again, these surveys show that Apivar® (amitraz) is one of the most commonly used miticides for treating Varroa in Canada. Through the repeated use of Apivar®, it is only a matter of time before we see the development of resistance to this miticide. Initial findings of decreased

[1] *No varroa mites are found in Newfoundland so data were only analyzed for provinces with this pest.*

Table 6: Varroa monitoring and chemical control methods as cited by the respondents of the 2018-2019 winter loss survey. Chemical treatment is in order from most to least commonly used.

Province	Beekeepers screening for varroa mites		Varroa control: treatment and methods			
			Spring 2018		Summer/Fall 2018	
	Sticky boards (%)	Alcohol wash (%)	% of beekeepers	Methods of treatment	% of beekeepers	Methods of treatment
NL	0	22	N/A	N/A	N/A	N/A
PEI	6	29	47	Mite Away Quick Strips®, 65% Formic acid – 40 mL multiple application, Apivar®	88	Oxalic acid, Mite Away Quick Strips®, 65% Formic acid - 40 mL multiple application
NS	30	40	70	Apivar®, Oxalic acid, Apistan®	90	Apivar®, Mite Away Quick Strips®, Oxalic acid
NB	19	50	38	Apivar®	88	Oxalic acid, Apivar®
QC	37	24	53	65% Formic acid - 40 mL multiple application, Apivar®, Apistan® and Oxalic acid and 65% Formic acid - 250 ml single application	98	65% Formic acid - 40 mL multiple application, Oxalic acid, Thymovar®
ON	20	59	75	Apivar®, 65% Formic acid – 40 ml multiple application, Mite Away Quick Strips®	95	Apivar®, Oxalic acid, Mite Away Quick Strips®
MB	9	71	82	Apivar®, Oxalic acid, Bayvarol®	94	Oxalic acid, Apivar®, Mite Away Quick Strips®
SK	12	81	100	Apivar®, Oxalic acid, Apistan®	87	Oxalic acid, Apivar®
AB	21	74	65	Apivar®, Oxalic acid, 65% Formic acid – 40 ml multiple application	67	Apivar®, Oxalic acid, 65% Formic acid – 40 ml multiple application
BC	N/A	28	61	Formic acid, Apivar®, Oxalic acid	85	Formic acid, Oxalic acid, Apivar®

efficacy have been observed in some provinces. It is becoming increasingly important that beekeepers become aware of the principles behind resistance development and the importance of monitoring the efficacy of all treatments, in particular Apivar®. This will help to mitigate unforeseen failures of treatments. Beekeepers are encouraged to incorporate resistance management practices such as using appropriate thresholds for treatment, and alternating miticides with different modes of action in their Varroa treatment programs. Good biosecurity and food safety practices will also go a long way to ensure healthy bees and a safe, quality product while reducing the disease pressure.

B. Nosemosis management practices

Nosema is a fungal pathogen that infects honey bees. Nosema ceranae gradually replaced Nosema apis to become the most frequently found nosema species in Canada. The real role of N. ceranae in honey bee colony survival during winter and spring build-up is still unclear. It could, in certain regions or under some circumstances have an impact and play a role in spring build up (Guzman et al., 2010). It was not cited by all surveyed beekeepers as a possible cause of colony mortality during the 2018-2019 winter loss survey, except in Ontario within operations with more than 25% losses.

In the survey, beekeepers reported the use of fumagillin for the treatment of nosemosis in spring and/or in fall of 2018 (Table 7). The percent of beekeepers that reported using this drug varied widely from province to province.

This year, beekeepers were also asked to report all alternative treatments that they use during the spring or the fall for helping in the control of nosemosis. It's important to know that Fumagilin–B is the only product registered by Health Canada for nosema treatment. Any other products mentioned by beekeepers are not currently registered for the treatment of this disease. These products are marketed and used as a general promotor of honey bee health.

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Table 7: Antibiotic (fumagillin) and alternative treatments for nosemosis as cited by the respondents of the 2018-2019 winter loss survey

Province	Use of antibiotic and alternative treatments for nosemosis (% of respondents)					
	Spring treatment			Fall treatment		
	Fumagillin	Other product	main alternative products	Fumagillin	Other product	main alternative products
NL	0	0	N/A	0	0	N/A
PEI	12	0	N/A	12	0	N/A
NS	20	0	N/A	30	0	N/A
NB	19	0	N/A	25	0	N/A
QC	2	8	CompleteBee®, Apple cider vinegar	4	15	Apple cider vinegar, CompleteBee®
ON	9	0	N/A	9	2	Hive Alive®, Thymol in syrup in fall when feeding
MB	9	3	Honey B Healthy®	3	9	Honey B Healthy®, Nozevit®, Thymol
SK	30	19	Thymol based feed supplement	30	30	Thymol based feed supplement
AB	42	0	N/A	41	7	Honey B Healthy®, Bee vital®
BC	16	N/A	N/A	13	N/A	N/A

C. American foulbrood management practices

American foulbrood (AFB) is a bacterial disease of brood caused by Paenibacillus larvae. AFB is considered endemic in Canada, and it has been of great concern to beekeepers. Oxytetracycline and more recently tylosin and lincomycin are antibiotics registered for treating AFB in Canada. The pattern of use for these antibiotics, as reported by beekeepers is presented in Table 8. Oxytetracycline was more frequently used by beekeepers in spring and fall than the others.

Table 8: Antibiotic treatments for American foulbrood (oxytetracycline, tylosin and lincomycin) as cited by the respondents of the 2018-2019 winter loss survey

Province	Use of American Foulbrood treatments (% of respondents)					
	Spring treatment			Summer/Fall treatment		
	Oxytetra-cycline	Tylo-sin	Lynco-mycin	Oxytetra-cycline	Tylo-sin	Lynco-mycin
NL	0	0	0	0	0	0
PEI	6	0	0	12	0	0
NS	65	0	0	50	0	0
NB	63	0	0	25	0	0
QC	8	0	0	2	0	0
ON	70	1	1	66	0	1
MB	62	0	0	44	6	0
SK	60	0	0	62	5	0
AB	23	0	0	28	0	0
BC	11	<1	0	6	4	0

Honey Bee Winter Loss and Population in Canada Since 2007

Reported winter loss has been variable from year to year in Canada since 2007. This year, the reported Canadian winter mortality averaged 25.7%. This is better than last year but it's still higher than the long term suggested baseline/ threshold for winter losses of 15%. In fact, since the beginning of this survey in 2007, this suggested acceptable threshold has never been reached. The national winter losses were highest in 2008, 2009 and 2018 which ranged from 32.6% to 35.0%. From 2010 to 2019, the national winter losses ranged from 15.3% to 32.6%, averaging 23.6%. During the period between 2007 and 2018 Statistics Canada reports showed that the total colony count increased by 35.2%.

Each lost colony costs beekeepers time and money to replace. Individual beekeepers experiencing high winter mortalities face large expenses replacing those lost bees. These increased expenses greatly affect profitability for individual beekeepers and can put some beekeeping operations at risk; however, on the Canadian industry scale, the overall increase in bee colonies over the years demonstrates that despite difficulties keeping healthy, viable bee colonies through winter the Canadian beekeeping industry is resilient and able to grow.

Since the inception of this harmonized survey in 2007, beekeepers have faced challenges keeping healthy bees. Causes for bee health concerns include pest management, climatic condition, bee nutrition, and bee exposure to pesticides in hives and the environment. Another added challenge facing beekeepers is the economics of beekeeping this includes variable honey prices versus the cost of production. Even though responses from this annual survey have provided evidence that beekeepers from various regions are using recommended practices for monitoring and managing honey bee pests and diseases; there are always the opportunities to make further improvements.

It appears that stresses caused by parasites and a combination of other stressors warrants further studies to provide alternative management practices to maintain honey bee health. At this time, beekeepers have few products to control Varroa. New options are important to mitigate the risk of developing resistances. Additionally, the only product registered to treatment of nosema (fumagillin) is currently unavailable. If there is resistance developed to the primary treatment for Varroa (Apivar®) and no available treatment for Nosema spp., beekeepers could suffer even greater difficulties keeping their bees alive. Ultimately, beekeepers will need more effective and additional options (miticides, antibiotics and non-chemicals) in their "tool box" if they are to continue effective integrated pest management to maintain healthy bees.

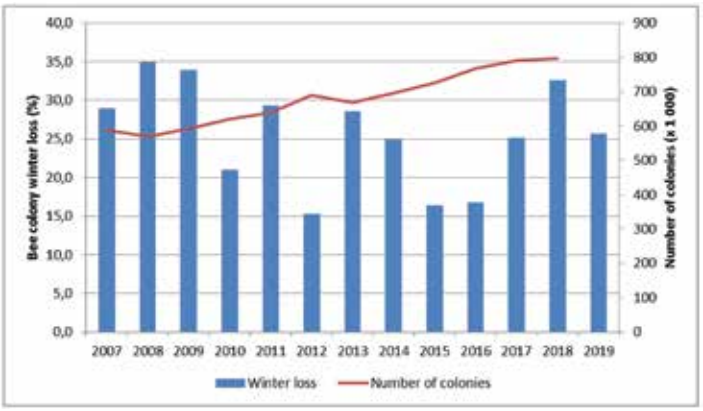

Figure 1. Summary of bee colony numbers and bee losses in Canada from 2007-2019

Further Work

CAPA members continue to work closely with industry stakeholders, the Bee Health Roundtable and provincial working groups to address bee health and industry economics. Members of CAPA and Provincial Apiculturists have also been actively involved in conducting surveillance programs at the provincial levels and across the country to monitor the status of bee health including emerging pest, and the small hive beetle. CAPA and the Provincial Apiculturists are also involved in conducting outreach and extension programs to promote IPM and biosecurity practices to beekeepers. Researchers within CAPA are active in evaluating alternative control options for Varroa mites and nosema and developing genetic stocks more tolerant to pests which will hopefully enhance the integrated pest management (IPM) practices and address honey bee health sustainability. ■

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Speech of the closing ceremony

Peter Kozmus (Acting President of Apimondia)

Dear beekeepers, scientists, exhibitors and friends of bees!

In the last few days we enjoyed attending this 46th Apimondia Congress. Over all there were here around 5.500 participants, from 134 countries. We listened to more than 320 lectures and we saw more than 360 posters. In the WBA we awarded more than 140 medals…

All this gives Apimondia Congress a special dimension. The scientific part of the Congress was very well attended and the ApiEXPO was also so interesting.

I believe you enjoyed the Congress and found many new friends, ideas, business opportunities and knowledge you will surely use in the future.

I believe that one of the important outputs from this Congress is Apimondia's position to step in the way to protect beekeepers and consumers. We surely only want high-quality bee-products in the market, and therefore we will increase testing and even greater efforts will be dedicated to this issue in the future.

Of course, such a big event in this very nice venue, would not have been so successful without a good, so professional, and numerous team. Many thanks to the Canadian Honey Council for all the work you did, and to AIM company, the PCO of this Congress.

I would also like to express my special thanks to all the volunteers, who helped us not getting lost in this big and beautiful building and also for helping us to deal with important information during the congress. Big thank you also to the translators.

And thank you Enid Brown, for having organized the WBA, which is

not an easy work indeed, and to John Hendrie who helped her. Thank you also to all the judges. Without your help it would not have been possible to organize the WBA.

I would like to congratulate all who joined the Apimondia EC. I believe that now we are stronger and that in front of us we have a bright future.

Concerning the future of beekeeping sector, the conclusion of our dedicated Round Table on this issue is to use the last developments in terms of technologies and entrants BUT with the vision of a kind of "Natural Beekeeping" preserving bees, bee products and environment.

Finally, my warmest recognition and thanks to the Executive Council members who now finish their mandates. I hope you will not forget us… We much appreciate all you have done for Apimondia and you can be sure that we will not forget you !!!!.

Today I am leaving position as acting President of Apimondia Federation to the new President Jeff Pettis. I must say that I was enjoying leading the Apimondia very much and I am even more happy to go back to my old position of Vice President. To you Jeff I wish you good luck at the new function and know that I will support you as much as possible. ■

International Honey Market

by RON PHIPPS

If the bees disappear off the face of the earth, man will only have four years left to live." -Attributed to Nobel Laureate Maurice Maeterlinck from Belgium ("Life of the Bee").

While the above statement, often attributed to Einstein, may be debatable, the fundamental fact of life on our planet is that the interactions between zoological and botanical life forms are both omnipresent and essential to the survival and evolution of all life. The planet is thoroughly organic and interdependent, demanding care for the global bee population and those whose labor and skills are essential to the survival of pollinators.

The Fundamental Anomaly

When one peruses the international honey market, certain abstractions suggest that beekeepers have entered a state of Nirvana. But the deeper and more comprehensive reality is they have entered a State of Crisis. On the one hand, honey consumption has increased. Prices for honey on the retail level have also increased. Honey is being utilized in a greater diversity of products and applications including manufacture of foods, pharmaceuticals, beverages, cosmetics, etc. In addition, the appreciation of natural and organic foods has reached unprecedented levels. Awareness of the vital role of bees to global food security and ecological sustainability has never been more acute among the general population, especially among young consumers.

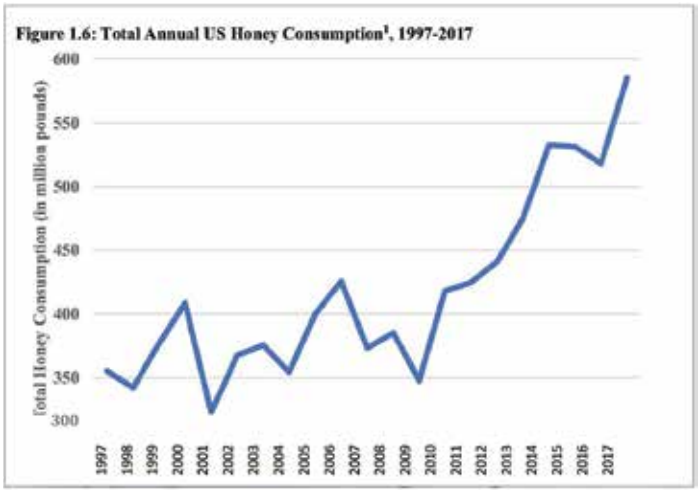

Chart 1 Source: USDA ERS Sugar and Sweeteners Yearbook

Consumption of honey in the U.S. has increased by over 40% in the past 20 years from about 400 million pounds to about 575 million pounds in 2018 (Chart 1). There are reasons to believe that honey consumption is higher because certain arenas of sales are not fully captured in the data.

But the reality also includes the facts that the global population of bees has been stable and in America it has for decades declined. The productivity of beehives has dramatically plunged according to numerous analyses, including the U.S. Department of Agriculture's report on U.S. colonies. Bee losses have increased due to a variety of environmental factors, demographic changes and modern industrial modes of agriculture which include heavy use of pesticides. The cost of keeping bees and producing honey has substantially risen.

As Professor Norberto Garcia, Dr. Stan Daberkow, Emeritus Economist of the US Department of Agriculture, and I have discussed, the above circumstances and the laws of economics suggest that international honey prices would increase dramatically. An economic anomaly, however, persists in that there is a steady erosion, indeed a collapse, of the prices for raw honey paid to beekeepers by packers, importers and exporters.

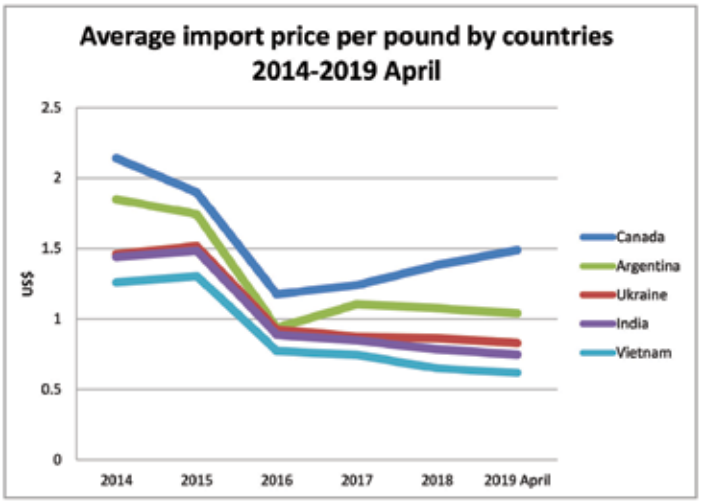

Chart 2 Data Source: U.S. Department of Commerce

The only explanation for this vexing anomaly is found in the prevalence of adulterated honey in the international market, which artificially increases supply of products which are fraudulently marketed as honey, and with which authentic high quality honey cannot compete. The modes of adulteration create an overall situation in which there are no ceilings to quantities, nor floors to prices of "honey." It is this crisis which haunts the American honey industry and demands a resolute so-

	2014	2019 April
Canada	2.14	1.49
Argentina	1.85	1.04
Ukraine	1.46	0.83
India	1.44	0.75
Vietnam	1.26	0.62

lution. The high quality, numerous positive attributes and charm of authentic honey are absent in its imitators. In light of increases in cost of production, and increases in demand for natural foods, it is totally shocking that honey prices would decline.

The crisis is not merely that honey adulteration has led to a collapse in honey prices, but it has also created "dead inventory" of authentic honey in the hands of beekeepers in North America and the international beekeeping community. Collapsed prices and dead inventories represent a duality of problems caused by adulteration and fraud. It is this duality which endangers beekeepers.

1) The Exposé

In July 2019, the Canadian government released results of a study indicating that 22% of the 244 honey samples pulled from retail, wholesale and bulk stocks were adulterated. The traditional Carbon Isotope test for cane and corn sugars and the Nuclear Magnetic Resonance (NMR) testing for authenticity were both used. The countries of origin of the adulterated products were outside Canada. It is important to note that exports from five of these countries constitute about half of the imports to the USA. This was the first official report in which NMR testing, based on the Bruker database of 19,000 samples, was used. The sources of adulterated samples included India, Pakistan, Vietnam, Turkey, Myanmar, Australia, USA, Germany, Thailand, Israel, Greece, Taiwan and others. The full report is available at http://inspection. gc.ca/about-the-cfia/science/ourresearch-and-publications/report/eng/1557531883418/1557531883647

It is important to note that there are other advanced scientific tests which were not employed for adulteration testing in the Canadian study. It is our understanding that the NMR testing parameters utilized identify only some forms of adulteration, but leave out other forms. Even though a more thorough investigation of adulteration, as is now possible and advocated, could have increased by two or three multiples the amount of adulteration found, this report has sent shockwaves which are still reverberating.

It is not the only international example of NMR exposing adulteration of honey. The scandal in Australia was reported in 2018. After the allegations of adulteration in honey sold by Capilano, the Australian press reported that Chinese interests purchased Capilano for $250M, a part of China's direct outside investment (DOI) to acquire strategic resources and create the new Silk Road. As Dr. Gudrun Beckh commented, the adulteration found in Australia was not due to the Australian produced honey but to a Chinese component blended with the Australian honey.

NMR is currently being used for exposure of adulteration found in the U.K. Samples of major brands were tested in early 2019 using several traditional methods and 55% of the samples contained a marker for bioengineered sweeteners. Later, NMR and HRMS testing at FoodQS laboratory in Germany found adulteration with rice, beet and corn syrup in about 70% of the samples. The U.K. government announced their intention to take action on food fraud in March 2019. Similar exposes are reported in France, Spain and Hungary. A recent report showed that 100% of the samples tested on the Indian retail market were found to be adulterated, and violated Indian government standards, even though the test utilized was the older carbon Sira test for C4 cane and corn sugars. As the Chinese media reported several years ago, 70-100% adulteration was found in honey samples pulled from retailers in major cities. As with the Indian study, the Chinese analysis did not employ advanced test methodology such as NMR, HRMS or others.

In both China and India, mass protests have been reported by the media against threats of food safety, food authenticity and food security. Governments have hired international experts to establish regimes to ensure food safety and security within domestic markets. Indeed, the concerns within their domestic markets are even stronger than those in the export markets.

Some major honey exporters have indicated that 100% of their products are extracted immaturely. Inspectors have reported finding resin technology and extraneous sweeteners. Walter Haefecker has aptly called the Chinese honey factories with their sophisticated technology "beehive factories." Members of the honey industry, including beekeepers, have witnessed in many countries multiple modes of honey adulteration which have been confirmed through modern testing using technologies which are relevant rather than obsolete, comprehensive rather than narrow, strong rather than weak. The U.S. Pharmacopeia reported, as the new Roberts White Paper confirms, that honey is the third highest category of food fraud/adulteration.

2) Global Bee Colonies and Honey Exports

We note that in 1947 the number of U.S. beehives was around 6 million; in 1970, 4 million; in 1990, 3 million; and in 2018, 2.8 million — finally trending upward over the last decade after falling to a low of 2.3

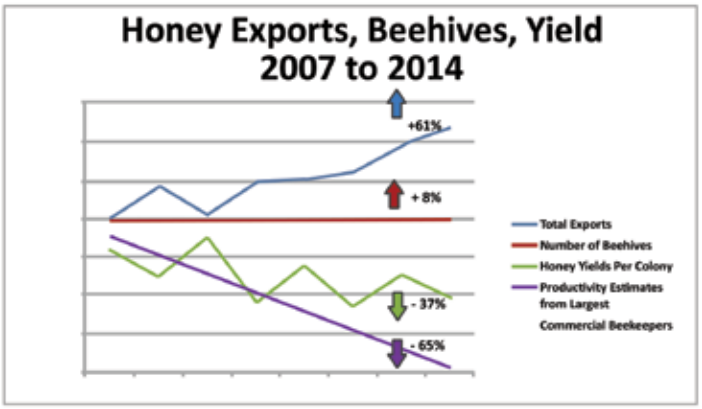

Chart 3

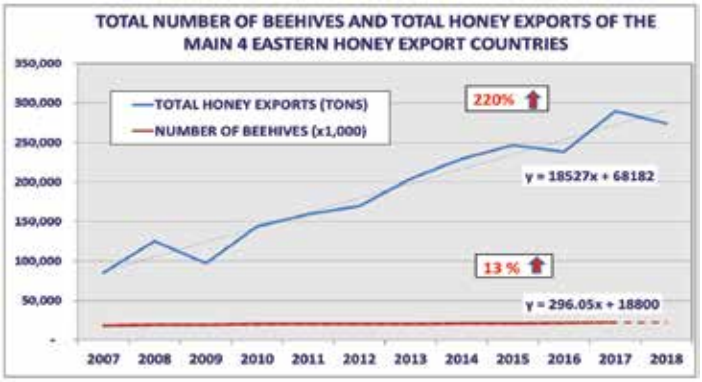

Chart 4 Source: FAO Data

million in 2008. Wintering losses have steadily increased in the U.S. A few years ago, Norberto Garcia and I introduced what I call the "Four variables" chart. This chart (chart 3 at right) illustrates the international anomaly of a huge increase in world "honey" exports, relatively stable numbers of bee colonies in the world and a significant decline in productivity per hive.

This synthesis of the facts demonstrates that "something is rotten in the state of Denmark." The phenomenon of the global adulteration of honey has taken on increasingly sophisticated modalities. Chart 4 illustrates the total number of beehives and total honey exports during 2007-2017 from the countries China, India, Vietnam and Ukraine. The generic anomaly pointed out several years ago persists and is poignantly

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expressed in countries that have played a major role in providing imported honey to Europe and the U.S. markets. Concerns of the global beekeeping community will be addressed by many experts during the next Apimondia meetings.

When we consider that the decline in honey production in North and South America and Europe is influenced by environmental degradation and the use of industrial forms of agriculture plus the loss of arable land, one would expect to see similar trends in India and China. The combined populations of those two countries is about 3 billion, if not more, and they are suffering environmental degradation, so we would expect the bee population declines would be even greater. Degradation of the water, soil and atmosphere in both India and China represent the most environmentally stressed regions in history. The studies have correlated a decline in productivity of honey with the reduction of forageable land. If environmental degradation dramatically affects the health of humans, it is highly probable that it also affects the health and productivity of bees which are producing authentic honey.

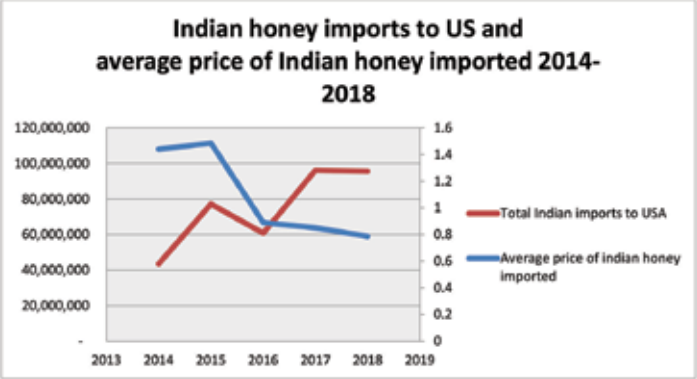

Chart 5 Data Source: USDA National Honey Report

Declines in productivity often mirror declines in bee populations as bees are stressed throughout the world. And yet the honey exports of these two countries have exploded, to the world from China, and to the U.S. from India, now the largest exporter to the U.S.

Leading medical research institutions and health organizations have noted the increase of human diseases as a consequence of environmental degradation. India tops the world in pollution-related deaths, accounting for 2.5 million of the total 9 million deaths attributed to pollution worldwide in 2015, according to a recent report by the Lancet Commission on Pollution and Health. China was second on the list, with 1.8 million total fatalities due to pollution. These numbers are modest since understanding the links between environmental toxicity and diseases is just emerging.

We see a clear crisscross trend as Indian honey prices dropped by nearly half in four years. Looking back to 2003, the average price of imported honey from India was $0.91/lb. This was higher than it was in 2018 at $0.85/lb., despite increased costs of production and inflation over a period of 15 years!!!

As expressed in the introduction, these anomalies have their explanation in adulteration which has been both witnessed and demonstrated by advanced modes of detection (NMR, HRMS, etc.). The decline in productivity has its obverse effect in the increase in the modes of illicit production and sophisticated adulteration of products fraudulently described as "honey."

The creation of pure, high quality, properly produced honey should be expected to conform to rather than contradict these scientifically established methods of confirming the authenticity of honey.

3) Honey Markets in Several Countries

This report is not the place for a detailed analysis, country by country. Understanding the macro-phenomenon, and the dynamics underlying that phenomenon, rather than elaborating its myriad effects, is the focus of this report. Nonetheless it is important, especially for the North American market, to make a few salient points regarding certain countries' markets. We will limit this section to Argentina, Canada, Vietnam, Brazil and the market for American local honey.

Argentina

There is no country which has been the focus of Masters at Market Manipulation more than Argentina. Argentina's authentic high quality honey has had to compete with adulterated honey. Export honey prices were lower than either expected or needed in 2018-2019. Although domestic prices have increased slowly, Argentine beekeepers are discouraged. The cost of production is very high.

This is an election year in Argentina, and the honey industry hopes are that there will be a reduction in the current honey export fee of about 12%. Currency devaluation and inflation have been internal factors affecting commodity markets in Argentina. The EU announced a significant honey tariff reduction in June 2019, which may generate a higher demand from European buyers for Argentine honey.

The current crop is about 55,000 metric tons. It is expected that 55% will go to the U.S., and most of the balance to Europe. New standards for drums and a traceability system have been successfully implemented by government authorities.

The number of beekeepers in Argentina has declined over the years from 25,000 to 8,500, and the number of beehives from 2.5 million to 1.5 million. Hive conditions are good at present, despite excessive summer rains. Argentine beekeepers and exporters see the current developments as consequences of the global battle against fake honey. It was expressed that "cheap honey will be much more expensive than it is today."

Brazil

Brazil remains the center of production and export of organic honey for the world. Brazil's exports to the world of organic and conventional honey increased from 24,000 metric tons (52.9 million pounds) in 2016 to 28,500 (58.3 million pounds) in 2018, with the U.S. taking about 80-90% of their exports. Brazil organic occupies 90% of the U.S. organic market. Over the past 2 years, export quantities to the U.S. declined, and increased to Canada and Germany.

Prices for Brazilian organic honey declined 45% between June 2017 and June 2019, and reached near parity with Argentine conventional honey in mid-2019. The trend must be upward from this point forward if the Brazilian organic project is to continue.

The condition of beehives is healthy and strong. As of July, the

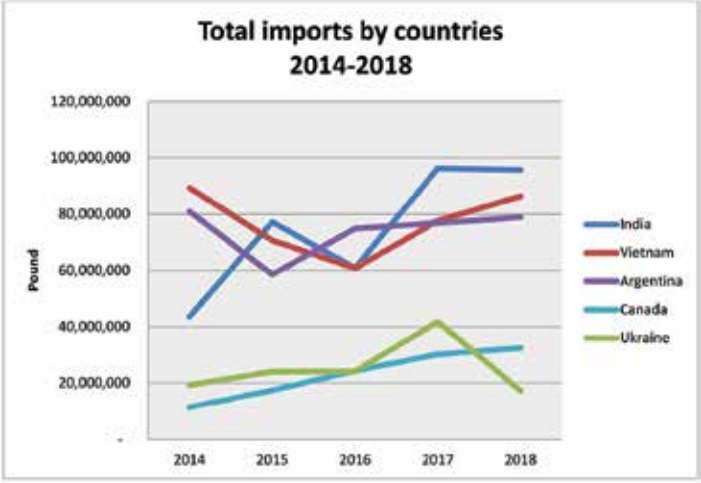

Chart 6

main crops in Southern Brazil were finished, and prized light colored honeys were being sold to Europe. Beekeeper revenues were in some cases below costs, with fuel costs high. Reports from the field indicate that some beekeepers are selling beehives, and that will cause a big drop in future honey production. The challenges for Brazil's organic projects are increasing, and the incentives to maintain and develop them are reduced by the current low price levels. Brazil's honey industry is asking, "Where are the fair market programs and labels, the concern about the environment, the product, respect for the social and environmental importance of pollination and honey production?"

Scientists consider that the health of the Amazon is directly tied to the health of the planet. Access to the European market is conditional on Brazil's compliance with the Paris Climate Agreement.

Vietnam

Reports from exporters in Vietnam indicate a loss of 20-40% in the number of bee colonies last year, and fewer beekeepers. U.S. honey imports from Vietnam reached a 3-year high of 86,323,234 pounds in 2018. However, the low market prices resulted in losses for beekeepers. Stress on beekeepers who are unable to repay loans for equipment and their homes is immense.

Some Vietnamese beekeepers have asserted that there is no problem for them to produce mature honey. However, it takes longer, reduces quantities and the costs are higher than the prices that most importers are willing to accept.

Canada

Canada is one of the world's great breadbaskets, producing some of the highest quality honey in the world. The Canadian beekeepers contribute to the pollination of foods which are rich in antioxidants and phytochemicals. The Canadian honey crop combines both high quality and special health benefits. In 2019 U.S. average import prices rose to U.S. $1.49/lb.

U.S. import prices for all colors of Canadian honey were up about 15% in 2018 compared to the preceding two years. The U.S. import quantity was 32,421,931 pounds in 2018, the most in three years, and the average price paid per pound was higher than for other imported honey. Canadian honey is generally white or extra light amber, properly produced and not adulterated. The Canadian government's study of honey samples confirmed the authenticity of Canadian honey for sale in the domestic Canadian market.

Canadian exports to all countries for 11 months of 2018 reached 17,784,871 kilos (39,206,000 pounds). Since prices remain substantially below the 2014 levels, which for many beekeepers are below the cost of production, the deep anguish of Canadian beekeepers is well known. Some are facing financial problems, like those reported in Argentina and Vietnam. Vivid and intense frustration at the current market conditions in the U.S. has been frequently expressed by Canada's beekeepers.

U.S. Local Honey

In the U.S. honey market, the interest in local honey has grown dramatically. This growth has been encouraged by a desire to support local agriculture and also a belief in the health benefits of locally produced honey, especially to prevent allergies by consuming honey with local pollen present in the region of the consumer.

The intention is good but executing a genuine and large local honey program may be demographically difficult. We note that the vast majority of American honey is produced in regions with very low population density. The consumption of honey is quantitatively higher in those large, urban and suburban areas in which honey production is very limited.

Problems have been reported with the current crop of citrus honey.

Chart 7

than narrow, 3) strong rather than weak. Those modes of detection of contemporary adulteration of honey include:

1. Nuclear Magnetic Resonance (NMR), with the Bruker database of the widest collection of 19,000 global honey samples, which detects illicit modes of production and sophisticated modes of adulteration, country of origin, immature honey, resin technology
2. High Resolution Mass Spectrometry (HRMS) which can detect bio-engineered and extraneous sweeteners, illicit modes of production, and resin technology
3. Water Analysis, which can distinguish moisture content from nectar that bees gather from the industrial water used by resin technology, which literally "washes" honey
4. Carbon Isotope for C4/C3 sugars (LC-IRMS)
5. Pollen analysis

The world honey industry owes a debt to Professor Vaughn Bryant's many years of meticulous technical study of the world's pollen sources. Professor Bryant is a hero to all those interested in the purity and authenticity of honey, both of which he has championed with dignity and expertise. It must be noted that pollen by its removal or addition can serve as an adulterant. Professor Bryant helped discover and expose this when he helped expose the circumvention of Chinese honey through third countries.

International collaboration between academic scientists, private laboratories, legal authorities, beekeepers, and international organizations is leading to a convergence in the definition of honey and the detection of adulterants which is needed to ensure honey's authenticity and quality.

Leaders of Apimondia issued a statement on what constitutes honey adulteration in December 2018, stating "The definition of Codex Alimentarius further rules out any additions to, nor any treatment intended to change honey's essential composition or impair its quality, for example: the use of ion-exchange resins for removing residues and lightening the color of honey, and the active removal of water from extracted honey with vacuum chambers or other devices." A convergence of efforts by organizations such as Codex Alimentarius, the USP, ISO, beekeeping associations, and various state and federal governments to create such a definition for honey that can cover sales between honey producers and their clients, is now occurring. Definitions made by Apimondia we believe will be consistent with Codex, the UNFAO, international law, the European Commission and the U.S. Pharmacopeia.

Since science does not stand still, new technologies are continually being developed. The toolbox must have multiple tools. Those tools

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must also be utilized to detect the multiple modes of adulteration and illicit production, not just to focus on one mode. This is particularly true of NMR which can analyze 38 variables. We also note that recent research efforts are rapidly advancing to detect many forms and combinations of adulteration.

It is imperative to note several things including the fact that those who gain economic advantage from Economically Motivated Adulteration have consistently tried to deny, disparage, delay and/or delimit the use of modern modes of detection. It is well known that the foxes who enter the henhouse are not capable of policing themselves because self-interest and hypocrisy lie behind their actions. This is one reason that Codex, Apimondia, the USP, the UN FAO and national governments are all looking at the phenomena of food fraud and economically motivated adulteration. In fact, there has never been such a wide, integrated effort involving the governmental authorities, academic, private and government laboratories, the media, the judicial systems and the world beekeeping community to expose and fight the plague of adulteration. This fight demands absolute integrity and absolute independence.

Anyone facing a serious illness will want to assure that the physicians will utilize the most advanced set of diagnostic tools. If surgery is required, the patient will want the surgeon to have the fullest kit of advanced surgical tools and the most advanced treatment for healing and prevention of recurrence of the disease. Contemporary surgical interventions often use teams of expertise. In modern academic research, whether in astrophysics, high energy particle physics, or genetics, collaboration is often international in its scope. These same principles which we use in treating illnesses and making advances in scientific and medical research must be applied to the battle against economically motivated adulteration of honey. Even those economically benefitting from the adulteration of honey and food fraud would apply these principles in dealing with their own health.

Resin technology is particularly insidious. During a public meeting of the U.S. honey industry, it was erroneously asserted in January 2016 that the U.S. FDA approved the use of resin technology on honey. In February 2016, the FDA contradicted the erroneous statements. This conclusion was reported in the April 2016, issue of the American Bee Journal. Indeed, in 2019, officials from the U.S. government indicated that the use of resin technology is being questioned with respect to any food. In Europe, food safety issues have been raised for the consumption of any food which has been subjected to resin technology.

Laboratories and inspectors for accreditation are in very sensitive positions, whether in North America, Europe or Oceania. Scientists in laboratories which are involved in certification and independent inspection have pointed out it will not do if they incorrectly certify a company and its products based upon answering only the questions which the party engaging the certifiers ask them to investigate. The certifying agencies must take their own initiative to ensure that all relevant questions are asked, correctly answered, and fully and openly reported. If relevant questions are not asked, and/or results of inspections are suppressed, those certifiers are subject to fines according to the European judicial system.

There are new forms of contracts being formulated between buyers and sellers of honey and other products, at all levels including retailers, manufacturers, food service, cosmetic and pharmaceutical companies, that are marketing a product or an ingredient. Blockchain traceability is helpful, but still more intrusive traceability regimes are needed and other requirements are imperative since traceability itself is inadequate to insure the authenticity and purity of honey. Truly independent inspectors are also essential to assure authenticity, integrity and compliance.

Foxes are certainly a clever and cunning species of animal. In recent months, there have been photos of foxes brazenly, blithely walking past 10 Downing Street in London, England. Nonetheless, foxes are not the most intelligent species within the zoological kingdom.

5) The Roberts White Paper

Professor Michael Roberts of the UCLA Resnick Center for Food Law and Policy has made a major contribution in his new White Paper entitled "A Food System Thinking Road Map for Policy Makers and Retailers to Save the Ecosystem by saving the endangered honey producers from the devastating consequences of honey fraud."

Professor Roberts, one of the world's most eminent experts on Food Fraud, has pointed out that beekeepers have become "an endangered species." According to Professor Roberts, "The endangered honey producer is a victim of honey fraud, a stubborn problem that threatens the very existence of a commercial supply of honey in the United States," continuing "in other words, cheap honey being imported into the U.S., which displaces domestic authentic honey, is the result of not only cheap labor costs and low cost of production, but also and most notably, fraudulent honey." Professor Roberts has also pointed out the vital role of the retailers in exercising their social responsibility to prevent honey fraud, food fraud and adulteration in the sphere of honey: "In the modern, global food supply chain, there has in recent years been a sharp escalation in the social roles that large food retailers and food enterprises are expected to play ... retailers are certainly well situated to address the honey problems." Meanwhile, "Consumers are increasingly demanding methods of production and processing that are environmentally sustainable, animal friendly, and compliant with labor practices."

For example, Professor Roberts points out that "Whole Foods has engaged in some creative presentations to demonstrate the consequences of the declining honey bee population. … Whole Foods, showcased in its Lynnfield store in Massachusetts how many of their dairy department products would cease to exist without bees. Items that would disappear included fruit-flavored yogurts, and chocolate milk, a 50 percent reduction in milk products, and a reduction in cheese products, almond milk, fruit juices. Continuing this theme, Whole Foods has also developed visuals as part of a Share the Buzz campaign to show how empty a grocery store looks like without bees."

Whole Foods is by no means alone among major retailers taking an increasingly interventionist approach. Costco has waged a high-profile campaign to protect the role of bees as pollinators, during which "Costco sent a letter to suppliers encouraging them to phase out the use of neonicotinoids for the protection of pollinators." Costco's website features a section dedicated to their involvement in protecting bees through $3.3 million in charitable donations since 2012 that also involves a traceability system to ensure the authenticity of honey. Walmart is also stepping up in creative and powerful ways to ensure food authenticity.

6) Geopolitics, Macroeconomics and Global Climate

Every industry exists and functions within a broader context, including the honey industry. The geopolitical context includes a global economic slowdown which is correlated with a huge increase in both national and international debt levels. It is as if debt has become irrelevant for governments. Debt has been and is plaguing countries like Argentina, the U.S., China and the international lending organizations like the World Bank, the IMF and the Chinese Development Bank. Debt creates chaos in international currency relations, which in turn creates volatility and unpredictability in the prices of honey. A recent article entitled "The Global Debt Binge Begins Anew" notes, "The world's debt rose by $3 trillion in the first quarter of 2019 — an almost unprecedented borrowing binge that brought total global debt to $246.5

trillion. … Q1's major uptick brought it to nearly 320% of the world's GDP, also near the alltime high, according to IIF's data." Domestically, "Total U.S. debt rose to a new all-time high of more than $69 trillion — led by federal government debt, which is now over 101% of GDP." - Institute of International Finance.

During the current trade wars we have seen the disintegration of international trade agreements with the U.S. and the increase of tariff and non-tariff trade barriers which have brought unpredictability into many markets. Increasing and decreasing tariffs are countertrends creating confusion and chaos in traditional supply-purchase relations, including in agricultural commodities like soybeans. In June 2019, President Trump announced increases in tariffs on Mexican imports of 10-25%. These tariffs are not being implemented, but the threat affects many companies making decisions about purchases.

The laws of chemistry and physics keep asserting themselves in dramatic climate changes, many of which are driven by self-feeding processes. As glaciers and the permafrost melt and retreat, and light colors are replaced by darker colors, vast quantities of solar energy are absorbed by the planet rather than reflected back into outer space. The increases in the quantities of heat-trapping gases such as carbon dioxide and methane further warm the planet.

Thus far in 2019, we have witnessed global weather changes that include:

a) Major weather events, flooding in particular, have hit the heartland of the United States: "In the past year, torrential rains have dumped water on U.S. farmlands, destroying acreage and delaying crops from getting planted on time. … This year, there are farmers who are the first in their family for three generations to not grow crops on their fields" *-'It never stops': US farmers now face extreme heat wave after floods and trade war"-CNBC*

b) The world continues to experience increases in the frequency, severity and volatility of severe weather events. El Nino and La Nina are included in these. While meteorology lacks the knowledge for precise predictions of severe events, enough is known about general trends that we anticipate that honey production will continue to be subject to unpredictable changes.

c) "The National Oceanic and Atmospheric Administration (NOAA) reports the average global temperature for June [2019] was 1.71 degrees Fahrenheit above the 20th century average of 59.9 degrees. NOAA also reported recordbreaking decreases in sea ice coverage in the Arctic and Antarctica."-Time Magazine

d) France and Anchorage, Alaska, experienced their highest temperatures in the historic records. By the end of July, the Netherlands, Belgium and parts of the U.K. joined the trend toward record breaking heat waves.

7) Conclusion

The Quest for Justice in the International Honey Industry has proved to be a long and complicated journey. A book is being prepared to provide a broader perspective regarding this Quest.

This Summer Professor Norberto Garcia and his wife, along with friends, journeyed by car from Argentina to Chile to speak to the Chilean Beekeeping Association. The journey was almost 20 hours each way. It involved traversing passes high in the spectacular Andes.

I told Norberto that their journey reminds me of an ancient Chinese fable from the Tang Dynasty. The Tang Dynasty was considered the apex of Chinese culture and a period in which China was open to absorbing and learning the wisdom of other nations. A monk and a troupe of interesting characters journey to India over the great Himalayan Mountains dividing India and China with its perilous, sheer peaks and cliffs. The goal is to bring back to China the sacred texts of Buddhism with their respect and advocacy of tenderness toward all forms of life.

The journey involves two antagonists, the White Boned Demon who can assume all kinds of disguises and masks and The Monkey King. The Monkey King is an impish figure from heaven, sent to accompany the monk and his troupe. During the journey, the White Boned Demon assumes the form of an old beggar begging for alms or a sweet, beautiful young damsel, in her silk gown. Whatever the disguise, the goal is to divert the monk and troupe and to destroy their quest for Wisdom. The Monkey King has magical powers to see through the disguises and therewith protect the monk so that his sacred journey can be completed.

An ancient Chinese saying goes: "Though the Monkey King can move at the speed of light, he can never leave the palm of Buddha." That means he can never leave the palm of truth, wisdom, justice, mercy and integrity.

After telling Norberto this ancient tale, Norberto replied: We need many new Monkey Kings! If the international honey industry is to integrate and balance the incentives to produce with the incentives to consume honey, product integrity must be achieved.

If the industry is to enter an Era of Creative Marketing, then adulterated honey must be excluded from the playing field and only authentic honey allowed to enter and compete in the international arena where beekeepers, exporters, importers and packers are on the same team competing for Honey's Golden World Cup. ■

Ron Phipps is Vice President of the Apimondia Scientific Commission on Beekeeping Economy and President of CPNA International, Ltd. He is Co-Chairman of the International Committee for Honey and Health. His academic work centers on "The Process Ontology and Cosmology of the Infinite" and he is President of the Long Island Concert Orchestra.

New elected president of Apimondia

Dr. Jeff Pettis has been elected President of Apimondia by the delegates of the Federation Members for a four-year mandate. Jeff has served as President of the Apimondia Scientific Commission for Bee Health from September 2015 to September 2019.

Dr. Pettis comes from a farming background and fell in love with honey bees while taking a course in Beekeeping at the University of Georgia. He completed MS and PhD degrees in Entomology while researching parasitic mites of honey bees.

He worked for the U.S. Department of Agriculture as a research scientist for over 20 years and now consults on bee health globally since leaving USDA. He has been a beekeeper for over 35 years and now manages 75 hives with his youngest son Kevin in Salisbury, Maryland USA.

He continues to work on queen health, parasitic mites and pollinator health. In his acceptance speech in Montreal he outlined his vision for Apimondia in three words, Communication, Diversity and Respect. He sees increased communication as vital to the growth of Apimondia, a need to capture the diversity of beekeepers and the different bees that are managed globally and finally, that we work to respect the bees. ■

HiveIrghts Help Wanted

Help Wanted: Fisher Branch (MB)
Interlake Honey Producers Ltd. P0 Box 328, Fisher Branch, MB R0C 0Z0 has the following positions:
Apiary Technician 5 Positions Available
Required for the 2020 Honey season. Seasonal ,full time, days, evenings and some Saturdays. Work is mostly outdoors, so must be able to work under hot conditions. The job starts April 1st – July 1st. End date: Sept 10th- October 31st. Wages: $13.00 - $16.00/hour. Minimum 2 years experience preferred. Performance and /or production bonus may be available.
Duties: include but not limited to, feed and care for bees, replacement of hives and production of nucs; moving hives, supering hives, detect and report hive health and apply correct disease cures and/or controls; keep field and/or production records; harvest honey; work on extracting line; cleaning extracting equipment and honey house; raise queens, assemble and maintenance of bee equipment; drive and maintain vehicles; other duties as assigned. Work is very physically demanding, with long days and heavy lifting.
The job is located 2 hours north of Winnipeg in the RM of Fisher NE 33-23-1W in Fisher Branch, MB.
Send resume by mail to Box 328 Fisher Branch, MB R0C 0Z0 or email anita@interlakeforageseeds.com

EMPLOYMENT OPPORTUNITIES, New Zealand
Are you looking for your next beekeeping adventure?
We're looking for Beekeepers
New Zealand offers an idyllic outdoor lifestyle. If you are looking for adventure, or want to enjoy the scenery, New Zealand offers it all.
Steens Honey NZ has been in business for over 30 years. We specialise in cropping manuka, in some of the most picturesque parts of New Zealand.
Are you a Beekeeper with at least 3 years' commercial experience? We can offer you experience in the exciting world of Manuka Honey, personal development, competitive remuneration & leadership opportunities.
If this sounds like you, please send a cover letter and CV to HRmasterton@steenshoney.com

Help Wanted: Kinistino, (SK)
Position 1
Bacon Apiaries Ltd, located in Kinistino, Saskatchewan, is looking for an Apiary worker for the 2020 honey crop season. The job will commence approximately on March 15, 2020 to Oct 31, 2020. Primary duties (but may not be limited to) includes moving hives, feeding and medicating colonies, evaluating colonies, supering hives and harvesting honey, extracting and storing of honey and repairing bee equipment. Availability to work long hours, including week-ends and evenings is required. Salary starting from $12.30/hr to $ 14.00/hr depending on experience.
Position 2
Bacon Apiaries Ltd, located in Kinistino, Saskatchewan, is looking for 5 Honey harvester labourers for the upcoming 2020 honey season. Job duties include using an automatic lift to place full honey supers on a conveyor, running honey frames through an uncapper, moving frames into an extractor, removing empty frames and putting them into supers, stacking them away, making new honey equipment and repairing existing honey equipment. Employees hours will be 40-60 hours/week (5-6 days) with wages starting at 12.30/hr to $14.00/hr depending on experience. Employment from July to September 24th 2020. Send resume to rbacon@sasktel.net

Help Wanted: Sexsmith, AB
Location: COUNTY GRANDE PRAIRIE No.1, Alberta
Moondance Honey Inc. located at 55063 TWP RD 750, Sexsmith, AB T0H3C0 has the following positions for the 2020 season. Beekeeper Technician (NOC 8431)-3 seasonal positions, wages $17 -18/hour, depending on experience. Duties include hive management, queen introduction, nuc production, pest/disease recognition and control, hive supering, honey removal and extraction,equipment construction and repair, and winter hive preparation. Requires 2-5 years of commercial beekeeping experience. Apiary Worker-4 seasonal positions, wages $15-16/hour depending on experience. Minimum of 1 year beekeeping experience or training. Duties include assisting beekeepers with hive management, supering, honey lifting and extraction, moving hives, and assisting with winter hive preparation. All applicants must be able to work in hot environments while wearing coveralls, handle heavy lifting, and not have allergies to bee stings. Apply to termeerbill@yahoo.ca or fax resume to 780-833-5747

Help Wanted: Surrey (BC)
Honeybee Centre is seeking 6 Apiary Technicians, (NOC 8431) for full time (40+hrs/ wk) employment ($15-$17.5) from February 15 – October 15, 2020. Must have minimum of 3 years' experience from working fulltime on a Canadian style commercial apiary in the min. capacity of Apiary Assistant or General Farm Worker. Duties include caring for Honeybees in the appropriate manner, coordinating the production of replacement bees & equipment; recognizing, reporting, monitoring hive health issues and applying appropriate treatment/ controls; harvest honey, pollen and bees wax; supervise small teams of workers; operate and maintain apiary equipment (including fork lifts, pumps, honey extractors); conduct bee yard maintenance. All applicants must be in good physical condition and able to work in a team environment. A valid driver's license may be required for some of the Apiary Technician positions. Positions do require some evening, night and weekend work. Please email a resume to Frank at frank@honeybeecentre.com

Help Wanted: Ardmore (AB)
T'N'T Apiaries require:
An APIARY FOREPERSON (NOC 8252) for fulltime (40+ hrs/wk) year round employment ($19.00-$25/hr depending on experience. Bonuses possible). Applicant must have a minimum of 5 years (seasons) fulltime in a Canadian style commercial apiary environment with a minimum of 3 years (seasons) working as an Apiary Technician.
Duties include:
• Caring for honeybee colonies in the appropriate manner.
• Co-ordinating the production of replacement bees and equipment.
• Recognizing, reporting, monitoring and controlling hive health issues.
• Harvest and package honey, pollen and beeswax.
• Supervise and train workers.
• Drive (including std transmission and medium duty trucks) and daily maintain vehicles.
• Operate and maintain other apiary equipment (including forklifts, chainsaws and pumps).
• Conduct bee yard maintenance.
• Keep field and/or production records.
• Interact with external farm personnel.
5 APIARY TECHNICIANS (NOC 8431) for full time (40+ hrs/wk) employment ($17.00-$22/hr depending on experience. Bonuses possible) January thru November 2020. Must have a minimum of 2 years (seasons) working full time on a Canadian style commercial apiary in the min. capacity of Apiary Assistant or General Farm Worker.
Duties include:
• Caring for honeybee colonies in the appropriate manner.
• Co-ordinating the production of replacement bees and equipment.
• Recognizing, reporting, monitoring hive health issues and applying appropriate treatment/controls.
• Harvest and package honey, pollen and beeswax.
• Supervise small teams of workers.
• Drive (including std transmission and medium duty trucks) and daily maintain vehicles.
• Operate and maintain other apiary equipment (including forklifts, chainsaws and pumps).
• Conduct bee yard maintenance.
• Keep some field and/or production records.

6 APIARY WORKERS (NOC 8431) for full time (40+ hrs/wk) employment ($15.00-$19.00/hr. depending on experience. Bonuses Possible) January thru November 2020. Applicants must be able to work in the presence of honey bees.
Duties include:
• Caring for honeybee colonies in the appropriate manner
• Assisting Technicians with bees and equipment.
• Assisting with harvesting honey, pollen and beeswax.
• Assisting with the bee yard and equipment maintenance.
Some evening, night and weekend work is required of all positions. All applicants must be in good physical condition and able to work in a team environment. A motor vehicle Operator's license with no serious infractions, recognized by the Province of Alberta and major insurance companies, is required for the Foreperson position and preference will be given to those Technicians and Worker applicants holding one.
Contact Dave Tharle, 44116 - Hwy 659, Ardmore, AB or Box 80, Ardmore, AB. (Fax 780-826-6013) Email: tntapi@mcsnet.ca

Help Wanted: Souris (MB)
HARLTON APIARIES has 5 Seasonal positions available for the 2020 Season
3 Apiary Workers (8431) for April to October 2020 and
2 Apiary Workers (8431) for July to September 2020
Wages $13 - $15 per hour depending on experience. 1-2 years experience preferred. Operating a forklift is an asset. A valid driver's license and the ability to speak English is an asset. Duties include assisting with feeding, bee hive maintenance and treatments, moving hives, harvesting and extracting honey, and winter preparation and some building of new hive equipment.
Contact Irwin Harlton, Harlton Apiaries Box 644 Souris (MB) R0K 2C0 204-483-2382, iharlton@mymts.net

Help Wanted: Big River (SK)
West Cowan Apiaries- Big River, SK. S0J 0E0 (SE 14-56-8 W3) is looking to hire the following for the 2020 Apiary Season.
Start Dates: April 6- October 23, 2020
One (1) Supervisor in Apiary- Minimum of 3-4 full seasons of apiary experience required.
Wage: $14.83- $20.00 per hour depending upon experience.
Job includes: to work in the presence of honey bees and will assist with colony management; honey extraction and processing; queen-rearing. Recognize and report beehive health issues and apply appropriate disease cures or controls. Supervise and give direction to other employees. Keep field and production records and any other apiary jobs that are required.
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Three (3) Apiary Technicians/Workers- Minimum of 1-2 full seasons of apiary experience required.
Wage: $12.29 - $14.82 per hour depending upon experience
Job includes: Wrapping and unwrapping hives; spring and fall maintenance; feeding hives; creating nucs; queen-rearing; supering; pulling honey (80+lbs) and carry & stack on the truck deck; extracting honey; moving bees; maintain bee yards; and any other assorted apiary jobs that are required
Requirements for both jobs: No formal education required but with at least a Grade 12 education would be an asset. Have a valid driver's license and have a vehicle to get back and forth to work. Experience driving a standard truck is a asset; be in good physical condition and to work in a team environment.
Employment Details: Seasonal and full time; minimum of 40+ hours per week.
Training is provided on an ongoing basis.
Most tasks are performed outdoors in all kinds of weather, work is repetitive and physically demanding.
Location of work: SE 14-56-8 W3- our bee yards are located in the RM's of Big River, Shellbrook and Canwood
Mail or deliver in person your resume with references by Dec. 31st to: West Cowan Apiaries- PO Box 425, Big River, SK. S0J 0E0 Fax to: 306-469-5779 or email to: c.warriner@sasktel.net

Help Wanted: Roblin (MB)
Help Wanted: 3012352 Manitoba Ltd. o/a Wendell Honey Box 1439 Roblin MB. R0L 1P0. Reporting to
work at Wendell Honey, one mile east of MacNutt, Saskatchewan. Transportation provided from there
to various bee yards.
12 full-time positions available at Wendell Honey in 2020
• Apiarist Technician (NOC 8252)
o help with Spring check, hive assessment and manipulation
o help with pest and disease control
o help with grafting, making nucs and raising queens
o assemble equipment
o help super hives
o help harvest honey
o help keep field production records
o help maintain beeyards
o help with Fall feeding, assessment and treatments
o help to wrap bees
o team lead/supervise as required
o other duties as assigned
• Positions available from April 6, 2020 to mid-October 2020
• Min. 2 years of experience working with bees necessary
• Work is physically demanding
• Wages $15.00 -$21.00 per hour depending on experience with Wendell Honey
• Possible production bonus
Email Isabel Wendell at isy@wendell.ca for fax 204-564-2568 or phone 204-937-7767
12 full-time seasonal positions available at Wendell Honey in 2020
• Apiary Worker (NOC 8431) to
o assemble equipment
o help super hives
o help harvest honey
o help maintain beeyards

o help with Fall feeding
o help to wrap bees
• Positions available from May 11, 2020 to mid October 2020
• No experience necessary
• Work is physically demanding
• Wages $12.50 - $15.00 per hour depending on experience with Wendell Honey
• Possible production bonus
Email Isabel Wendell at isy@wendell.ca for fax 204-564-2568 or phone 204-937-7767

Help Wanted: Austin, (MB)

New Rutherford Apiaries (4647204 Manitoba Ltd) RR#1, Austin, MB R0H0C0
Apiary Technician/Worker 4 Positions
Located north-west of Austin, MB in the RM of North Norfolk (69033), New Rutherford Apiaries requires four full time, seasonal, Apiary Technician/Workers for the 2020 season. The positions start: March 05 - June 05, 2020. End date: September 15 - November 05, 2020.
Duties include helping with: honey harvesting and extracting, feeding and medicating hives, moving hives, making hive increases, queen rearing, building hive equipment, bee yard maintenance and clean-up. Must have at least one season of beekeeping experience. Work is physically demanding, often in a very hot environment with weekend and evening hours required. Wage rate of $11.85 - $15.00/hour depending on experience.
Apply to Mike Lewis at: mike-beehive@hotmail.com ph: (204)466-2551 or by mail to above address.

Help Wanted: Mission (BC)

Apiary Workers Needed
Golden Ears Apiaries Inc., located at 33197 Ito Place, Mission, BC, is seeking 12 Apiary Supervisors at $14.80/hr starting Feb 1,2020 until Oct. 31/2020, working 40+ hrs/week. Apiary Supervisors must have a minimum of 3 seasons working full time (40+hr/wk) in a Canadian style commercial beekeeping operation, and must have a good understanding of honeybee management and have the ability to independently assess hive health and make decisions regarding individual hive management. Also, we require 3 Apiary Technicians at $14.13/hr working 40+hr/wk, from March 1,2020 to Oct.31/2020. Apiary Technicians must have a minimum of 1-2 seasons working in a Canadian style commercial apiary, as an Apiary harvester. Apiary Technicians will be required to assist Apiary Supervisors with day to day colony management, extracting and honey processing. All positions do require some evening, night and weekend work. All applicants must be in good physical condition and able to work in a team environment. English is an asset as well as a valid driving license. Work will be in southern BC (Fraser Valley). Accommodations available. Contact Carolyn Shipley at jmcshipley@shaw.ca.

Help Wanted: Granum, (AB)

SUPERNUC APIARIES located near Granum, AB (251032 TWP RD 104) has the following positions for the 2020 season. APIARY WORKERS (Technician/worker NOC 8431) 4 positions; wage starting at $15.00 - $18.00/hr, needed full time (45+ hrs/wk) from Mar 1, 2020 through October 31, 2020. Some evening, night and weekend work will be required. Accomodations are available. 1 year experience required. Duties include assisting with beehive maintenance and treatments, building and repairing bee equipment, moving hives, harvesting and extracting honey, and winter preparation. All wages are negotiable based on experience and productivity. A valid driver's license and the ability to speak English is an asset. Must be physically fit and accustomed to working with honeybees. Email resumes to aovinge@gmail.com or fax to 403-687-2154.

Help Wanted: Tees (AB)

TEES BEES INC. requires:
Three APIARY TECHNICIANS (NOC 8431) with a minimum of 2-3 years (seasons) experience working on a Canadian style commercial apiary in the min. capacity of Apiary Worker or General Farm Worker with employment March thru October 2020 ($15-$19/hr depending on exp. with possible bonus) (40+ hrs/wk); Duties include: caring for honeybee colonies in the appropriate manner; coordinating the production of replacement bees and equipment; recognizing, reporting, monitoring hive health issues and applying appropriate treatment/controls; harvest and fill honey barrels and containers; supervise small teams of workers; driving and daily maintenance of vehicles; operate and maintain other apiary equipment; conduct bee yard maintenance; keep some field production records. A motor vehicle operator's licence with no serious infractions, recognized by the Province of Alberta and major insurance companies is required.
Five APIARY WORKERS (NOC 8431) with a minimum of 1 year (season) experience and with employment March thru October 2020 ($15-$17/hr depending on exp. with possible bonus) (40+ hrs/wk); Duties include caring for honeybee colonies in the appropriate manner; assisting Technicians with bees and equipment; assisting with harvesting honey; assisting with the bee yard and equipment maintenance.
All wages are negotiable based on experience and productivity. Applicants must be able to work in the presence of honey bees. All positions may require some evening, night & weekend work. All applicants must be in good physical condition and able to work in a team environment. Ability to speak English is an asset. Contact Jeremy Olthof at 23318-Hwy 50, Tees, AB; mail to RR1, Tees, AB T0C 2N0; or email at teesbeesinc@gmail.com.

Help Wanted: Fort Macleod (AB)

POELMAN APIARIES LTD. located near Fort Macleod, AB (102007A Range Rd 254) has the following positions available for the 2020 season: 6 SUPERVISORS (SKILLED WORKER, NOC 8253) with a minimum of 5 years(seasons) experience working at a Canadian apiary. Employment needed from March through October 2020; wage starting at $15.00 - $17.50 (depending on exp. with possible bonus) (40 + hrs/week). Duties will include: caring for honeybee colonies in the appropriate manner; coordinating the production of replacement bees and equipment; recognizing, reporting, monitoring hive health issues and applying appropriate treatment/controls; harvest and fill honey barrels and containers; supervise small teams of workers; driving of vehicles; operate and maintain other apiary equipment; conduct bee yard maintenance.
18 TECHNICIAN/WORKERS (LOW SKILL WORKER, NOC 8431) with a minimum of 1-2 years experience. Employment needed from April through November 2020; wage starting at $15.00- $16.50(depending on exp. with a possible bonus) (40 + hrs/week). Duties will include: caring for honeybee colonies in the appropriate manner; assisting Technicians with bees and equipment; assisting with harvesting honey; assisting with the bee yard and equipment maintenance.
2 GENERAL FARM LABOURERS (LOW SKILL WORKER, NOC 8431) experience is an asset but will be trained. Employment needed for April through November 2020; wage starting at $15.00 per/hour (with possible bonus) (40 + hrs/week). Duties will include: Supering and harvesting honey, cleaning honey extraction and storage equipment, barrel moving prep, filling and storage, manufacture and assemble and maintain hive equipment, and bee yard maintenance.
All wages are negotiable based on experience and productivity. Housing is available. Applicants must be able to work in the presence of honey bees. All positions may require some evening, night & weekend work. All applicants must be in good physical condition and able to work in a team environment. Ability to speak English is an asset. Email resumes to pollenpal@gmail.com attention Poelman Apiaries or fax to 403-687-2410 or mail to Box 1887 Fort Macleod, AB T0L 0Z0.

Help Wanted: Shellbrook, (SK)

Hannigan Honey Inc. Located at #9 Shell River Road, Shellbrook, SK. is now accepting applications for 8 Apiary Harvest Labourers/worker(NOC8431).
These positions are available on a seasonal basis (45+ hrs/week), running from July to October 2020. Duties include honey extraction, cleaning extraction and storage equipment, filling containers, cleaning and maintaining hive equipment. Workers are required to be mentally and physically fit and must be able to work in the presence of bees. Wages start at $11.06 - $13.85/per hour. Please send resume to Dave Philp, Box 367 Shellbrook, SK. S0J 2E0 or email hanniganhoney@sasktel.net.

Help Wanted: East of Saskatoon (SK)

Meadow Ridge Enterprises Ltd requires 5 Seasonal Apiary Harvest Labourers for the 2020 season. Meadow Ridge Enterprises is commercial beekeeping and queen rearing operation. 5 full time seasonal positions are needed commencing in April and ending in October. Minimum one year beekeeping experience, with wage starting at $12.00 - $16.00 per hour dependent on experience. Potential to earn bonuses. Duties include: spring feeding, hive maintenance, grafting, raising new queens and building nucs. Supering hives, harvesting honey, extraction of honey, fall feeding, wrapping of colonies, equipment cleaning, repairing and yard maintenance. Must be able to work long hours, weekends and holidays in all kinds of outdoor weather. Job requires heavy lifting, and a valid driver's license. Meadow Ridge Enterprises is located 10 miles east of Saskatoon. Please email resumes to a.j.robertson@sasktel.net

Help Wanted: Nipawin, SK

Yves Garez Honey Inc, P.O Box 2016, Nipawin, SK, S0E 1E0 seeks employees for the March 2020 to October 2020 season at facilities located 10 km North-East of Nipawin, Saskatchewan.
Good work ethics, health and stamina essential, for hard work, heavy lifting, long days including some weekends. Those allergic to bee stings and work need not apply.
-8 Apiary Technicians (NOC 8252) with experience in handling bee hives including unpacking and packing, checking, feeding, medicating, cleaning, moving, splitting, supering, raising queens, as well as harvesting and extracting honey. Wages $ 15.00 to $ 20.00 per hour, depending on experience.
-8 Apiary Workers (NOC 8431) without experience. We will train successful applicants in bee yard maintenance and hive manipulations. Wages $ 11.50 to $ 14.00 per hour. email: y.garez@sasktel.net

Help Wanted: Kinistino, SK

Seeking skilled apiarist to take on Manager of operation role, working directly under the CEO. Must have 5 years beekeeping and management skills and or training. Experience and fluentcy in English a must. More details available via email. Wage as per NOC code median wage for this position with opportunity for bonuses and continued employment.
Apiary Harvest Labourers and Apiary Harvest workers required for seasonal work in a commercial honey production and bee rearing operation for the 2020 season.
Three Apiary Harvest Labourer positions available for 5-7 months (starting no earlier than February). Labourers perform (but are not limited to) tasks such as supering hives, harvesting honey, cleaning honey extraction and storage equipment; barrel filling and moving; repair, assemble and maintain hive equipment and bee equipment; bee yard maintenance. Knowledge of the industry, a valid drivers licence and English speaking skills an asset but not mandatory. Wage starts at $11.35/hr with subsidized housing option, transportation and potential for bonuses based on performance, attitude and character.
Three Apiary Harvest worker positions available for up to 8.5 months (Feb to November). Apiary Harvest Workers perform (but are not limited to) tasks such as supering hives, harvesting honey, cleaning honey extraction and storage equipment; barrel filling and moving; repair, assemble and maintain hive equipment and bee equipment; bee yard maintenance; assist with colony manipulation; assist with colony treatments; assist with moving colonies; assist with feeding colonies. Canadian beekeeping industry knowledge, 1 year experience, valid drivers licence and English skills required. Wage starts at $12.35/ hr+ with subsidized housing option, transportation and potential for bonuses based on performance, attitude and character.
Availability to work long hours, evenings/nights, holidays and weekends is required for all positions. Work is faced paced and physically demanding with heavy lifting. Must be able to work in all weather conditions. Email resume and cover letter with references to B's Bee Ranch Inc at beeranch@sasktel.net

Help Wanted: Austin (MB)

Full time seasonal Apiary/Farm foreman (NOC 8252) and Apiary Laborers or Workers (NOC 8431) positions available at Busy Bee Apiaries Ltd. honey farm near rural Austin, MB., Road Lane #63074 for the 2020 season.
Apiary/Farm Foreman (1 position) and Apiary Laborers or Workers (7 positions).
Apiary/Farm Foreman: April 1 - Oct.31/2020. Duties: supervisory duties, all apiary management like checking, medicating, feeding bee hives, queen & nuc production, harvesting/extracting honey, maintenance of all kinds, transporting bee colonies, woodworking, organizing, clean-up, other duties as assigned. Must have valid drivers license and English writing and speaking skills. Wages: $15.00-$20.00/hour based on qualifications. Looking for a minimum of 5 years beekeeping experience.
Apiary Laborers or Workers: 2 positions, April 1-Oct 31/2020, 5 positions, June 1-0ct.15/2020.
Duties: All supervised hive management, like checking, medicating, feeding bee hives, queen and nuc production, harvesting/extracting honey, woodworking, clean-up, other duties as assigned.
Wages: $11.61-$15.00/hour based on experience/ability. Drivers license an asset, No education requirements. Hours of work for all positions are generally Monday-Friday and Saturdays as required and 08:00-18:00 but longer if required.
Send resume to Busy Bee Apiaries Ltd. Box 358, Austin MB., ROH OCO, or email: pilotman1977@gmail.com

Help Wanted: MacGregor, MB

11 SEASONAL BEEKEEPERS (Applicants must be permanent residents or citizens of Canada)
4 Apiary Technicians, wage range $13.50-$16.50/hr
7 Apiary Workers, wage range $12.25-$13.75/hr
Expected employment duration (Mar 1/20- Oct 31/20), two positions of apiary workers (Mar 1/20-Feb 28/22)
Start/end dates are flexible. Valid driver's license an asset, previous work exp. is necessary for technicians and recommended for apiary workers. Candidates must be willing to work flexible hours in a fast paced, repetitive & physically demanding environment. Duties include: assess, feed, and medicate honeybee colonies, remove/extract honey, split/balance/relocate colonies, clean/collect pollen, build/repair beehive equipment, and perform routine light maintenance on machinery/vehicles.
Contact: Nichol Honey Farm Ltd., Box 461, MacGregor, MB, R0H0R0. Phone (204) 252-2770, Fax (204) 252-2129,
or e-mail nicholhoney@yahoo.ca