



Hive Rights

August 2009
Vol 22 # 3

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Canadian Honey Council

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Schools, libraries, non beekeepers, university or government personnel can receive Hivelights magazine through special membership as "Friends of Canadian Apiculture".

Please contact the CHC office for more information.

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HiveLights

August 2009 Vol 22 #3

Honey bee foraging on a canola flower.
Photo: Jim Campbell, MB



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Canadian Honey Council

Heather Clay, Chief Executive Officer, CHC

Apivar EUR

The CHC's request for Emergency Use Registration EUR of Apivar (amitraz) for the treatment of varroa mites on honeybees has been approved by the Pest Management Regulatory Agency. The approval is valid for the period 1 July 2009 to 30 June 2010. With this temporary approval in place, beekeepers now have access to more treatment choices for dealing with varroa mites. Veto Pharma, the supplier of the strips, expects to ship product in July. The CHC thanks Manitoba Agriculture Food and Rural Initiatives staff for their help in submitting the application and the staff at the Pest Management Regulatory Agency for prompt attention to the request.



to speed up the process. Sending the applications from SK and MB to AB where there is more staff may also be considered if slow LMO turnaround does not improve.

There have been some changes in the process of issuing LMO's. Advertising in job banks must be demonstrated and an explanation given if Canadians have been rejected. A new calculation is being developed to establish fairness of wages so that employers cannot bypass Canadians to fill positions with foreign workers. HRSDC is willing to consider a new NOC code for beekeeper assistants and will help us edit any proposal for change.

Pest Management Regulatory Agency

A proposal was announced 4th June to remove the status of CAPCO 94-05 for formic acid by December 31, 2010. The note to CAPCO 94-05 document was issued in 1994 based on the best knowledge at that time. Since then, there have been refinements to the methods of application of formic acid. Many beekeepers rely on 65% formic acid for suppression of varroa mites and are keen to have it available as a legal product. The CHC has requested that the PMRA extends the deadline for withdrawal of formic acid to give our industry time to acquire the necessary data for registration.

Agriculture Agri-Food Canada - Minister Ritz's Office

A very unsatisfactory meeting was held with the policy advisor for the Minister of Agriculture. Corey, Jerry and I explained the issues of hive health, honey labeling and requested more information on research positions for AAFC. There was no information forthcoming and the minister's staff are supposed to "get back to us". The

CHC will follow up with the minister but expect little based on the current political environment. The threat of an election appears to be causing a great deal of anxiety in Ottawa.

Canadian Food Inspection Agency (CFIA)- Honey Inspection

A meeting with CFIA was cordial but a repeat of the previous year's issues. No progress has been made on labeling regulations. Staff from Regulatory Legislative and Economic Affairs explained that the earliest we can expect pre-publication is fall 2009 and final gazetting in fall 2010, provided that there is no election. The honey file was bumped from the Justice Department priority list but has been reassigned again and is expected to work its way through the system.

Canadian Food Inspection Agency (CFIA) - Animal Health Division

Veterinarians from the Animal Health Division, met with us to discuss honey bee importation issues. CFIA has been sent a copy of the recent (17th May, 2009) management plan for Western Australia. There are no reports of SHB spreading in that state. Asian honey bee incursions occurred in far north Queensland but the finds were limited in area. The bees were eradicated. The location is not near the queen producing areas of south eastern Queensland.

We requested statistics for imported queens and package bees. The Animal Health Division has a very poor reporting system. There is no computerized tracking process and no resources to upgrade their informatics system. They are limited by manual reporting of numbers, inconsistent formats, inaccurate data and no standardized reporting. The import data is effectively useless and the system is an embarrassment to their staff.

Queen exports to Chile are currently not possible as the Chilean requirements are unreasonable and the CFIA cannot meet their protocols.

Human Resources and Social Development Canada

Three representatives of the CHC, Corey Bacon Chair of the Board, Jerry Poelman Treasurer and Heather Clay CEO travelled to Ottawa in June to meet with government officials. We met with the Director General for the Temporary Foreign Workers in Gatineau, QC. Processing times for a Labour Market Opinion (LMO) is an issue for beekeepers. In some cases it has taken 16 weeks to get an LMO. Work permits cannot be issued in the foreign country until the LMO is received. HRSDC says the process time should be a maximum of 12 weeks and most provinces are meeting a turnaround of 8 weeks. There may be delays in AB because some HRSDC staff have been reassigned to deal with the large number of recent EI applications. HRSDC will consider having all beekeeper applications in some provinces handled by one case worker

► pg 4

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Surveillance for SHB will be implemented by Quebec. There are no restrictions on colony movement and no plan for containment. A report has been submitted to the OIE (The World Organizations for Animal Health) and it could affect our status regarding importation. The difference is whether SHB is not known to occur or whether it is known not to occur.

Agriculture and Agri-Food Canada - Marketing

Market Development staff explained the new Agri Science clusters and the potential for funding opportunities. We would be eligible to apply for funding if we can meet the requirement for 50% of the project cost as cash. The Agri-Stability program has not been useful for beekeepers in a loss situation. We explained the reasons that it is not suitable for accounting for apiculture and the problems with giving a value to inventory. AAFC will let the Agri-Stability personnel know and suggest that we should invite those advisors to our next meeting.

Agri-Marketing

The CHC has joined Brand Canada and is pursuing the development of a Long Term International Strategy for marketing honey. We have applied for funding to begin the process of promoting Pure Honey 100% Canadian to overseas markets. As well, we are investigating use of the Brand Canada signage and the potential for incorporating their logo into our marketing plans.

Business Manager Position

The restructure of the CHC has been very positive. We now have an office manager Geoff Todd and we are in process of hiring a business manager. An outline of the position appears in this magazine and on our website. All candidates who feel they meet the qualifications are invited to submit a résumé before 1st September, 2009.



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Regional Reports

Maritimes

Well here we are back in the busy season once again, 2009 brings another year of heavy losses to Canadian honey bee industry. Maritime beekeepers have not been left out with some areas reporting losses in the 40 percent range and none less than 20 percent. Some beekeepers who have previously escaped heavy losses have now been affected.



Tom Trueman

There are a number of causes being put forward but it seems that varroa

and poor fall weather are near the top of the list. It goes without saying that continued losses of this magnitude are unsustainable and will result in decreasing colony numbers both locally and nationally.

The maritime bee tour will be held on Prince Edward Island this July and promises to be an informative and entertaining weekend.

As there are hives to split and supers to install I will cut this report off a bit short. Wishing everyone a productive summer.

Ontario

The weather so far in 2009 has not been favourable for beekeeping. We had a long cold, snowy and windy winter. All the winter loss surveys are not quite completed at the time of writing this article, but so far we seem to be around a 25% loss. The winter loss for nucs was much higher. Reports from six nuc producers that had nucs put away for spring sales are reporting 70 to 90% loss. It seems most of the nucs starved with a few other problems. They used the feed in the middle and wouldn't move to the outside to new feed, so they starved with frames of honey in the box. The spring has been wet and cool with temperatures below normal with a lot of wind. Every time the sun shines the wind also blows. During the dandelion bloom there wasn't a lot of good flying days and the bees were slow to build up without the dandelion nectar. We have been waiting for nice flying weather with temperatures above 20 degree celsius for queens to get mated. It is now June and temperatures still remain below normal.

The Tech Transfer Team have been busy this spring putting on three different courses in various areas

of Ontario for a total of eight courses. They were Introductory Beekeeping, Beekeeping and Integrated Pest Management and Introductory Queen rearing. There seems to be a renewed interest in treating and pest management without trying to use too many hard chemicals.

The hives were shipped for pollination of blueberries in Quebec and New Brunswick at the end of May and the first week of June. There wasn't quite as much as a demand as other years.

Honey in Ontario seems to be at a premium, we had a smaller crop in 2008 and most of the honey that was produced has been sold between beekeepers or packers in Ontario.

The OBA Summer meeting will be held in Guelph on Saturday, June 27th, the morning program will be set up with a rotation of stations providing



Dan Walker

information on collecting other hive products like, royal jelly, propolis, pollen and bee venom. Dr. Maria Spivak will be speaking on Bee breeding. Other speakers

will include Dr. Ernesto Guzman, the Tech Transfer Team and a representative from OMAFRA. There will also be a Queen auction to raise funds for research. There is an additional day set up for an Apitherapy Symposium on the Sunday, following our OBA meeting.

As some of you may have heard Doug McRory our provincial apiarist since 1985 has retired. He will be greatly missed in Ontario. Doug was dedicated to the beekeeping industry and worked tirelessly for the OBA by getting informative speakers for our meetings and working with the OBA board and the Tech Transfer Team in the best interest of all beekeepers in Ontario. Doug also was very knowledgeable and demonstrated his ability as a speaker in Ontario and other parts of Canada.. We would like to thank Doug for his many years of hard work on our behalf and wish him well in his retirement in doing the things he enjoys. I am sure we will continue to see him around in the beekeeping community.

Manitoba

How long do beekeepers have to suffer? How much revenue are we losing trying to rebuild colony numbers? How much are you willing to pay for replacement colonies? Last season colonies were selling for as high as \$300.00 a hive, this season it's almost \$400.00. Are you willing to pay \$500.00 next year?

This past winter was long and cold, spring couldn't come fast enough. When the warm weather arrived in April, all was forgotten. Everyone looks forward to having a look, putting your hands in the strong healthy

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hives, receiving a few stings from old bees. AHH I love it! After a week of nice weather it turned nasty again. During the month of May we received 1 to 2 days per week of good bee weather, not nearly enough to give the hives that good kick start they need.



Bruce Podolsky

The average winter loss seemed to be about 20%, and another 25% were poor. The average overall loss is about the same as last year 30%. However the cold, damp, snowing days escalated the losses in some areas to 65% plus. Varroa seems to be the biggest concern for colony losses. Early June, the dandelions are out but the temperature still doesn't warm up till mid day and nearly every night the temperature falls to below freezing. Were still buying replacement colonies, making splits and hoping to have the bees ready for the honey flow. June 11, After 6 straight days of rain and cold weather summer arrived. We still have 900 queens in the bank and more arriving. We have to split the strong ones, transfer the early nucs to regular hives, super the strong to prevent swarming and more all the colonies to summer locations. Over half of the summer yards are too wet to move to. Moving hives the other night I had a serious breakdown, the wheel on the forklift broke off. After loading the second forklift were back in business. Later that night, about 3:00am the forklift and truck with a part load of bees were both stuck in

the mud, 2 hours later we're on the road again. Don't you just love moving bees in a wet spring!

You need to ask yourself, How much are we willing to pay for our colonies? Some producers are making up one frame nucs during the summer, but

the nucs won't bring a crop until the next season after you lose 10 to 15% or more never mind selling that honey. It could be 16 to 20 months before you receive payment from the honey from the hives.

Some regions of Canada have mild winters and long bee season, other have pollination contracts, or live close to large urban centers, were they are able to sell their honey and/or bee related products directly to the consumers. For most of the prairies we only produce honey. Our season is short and we have to endure a long cold winter.

This past spring California had great weather, I spoke with a few beekeepers who stated their hives were boiling with bees, many hives swarmed. We have access to young bees with a new queen right next door, but we continue to bring in packages from half way around the world that cost twice as much. Or we purchase more hives, splits, or nucs from our fellow beekeepers when we already have more dead outs and equipment than we know what to do with. Now we run the risk of getting disease and wax moth from our excess equipment. For

you beekeepers that seem to think Canada doesn't have all the same diseases and problems as our USA neighbours you need to pull your head out of the sand and look to your neighbours that are losing their shirts. The USA migratory beekeeper hauls his hives all over the US, and then brings the hives right against our border for the honey flow. I don't think the bees are going through Customs and inspections every time they fly across the border. I'm not saying we should blindly open the border to packages; we must have protocols in place.

Wouldn't it be nice to treat your bees in the packages? The queens could be shipped in a battery box safe from all treatments, instead of having residues remain in your hives for years. We must act now if we want a sustainable industry.

How much are you willing to pay when you have high losses????

Saskatchewan

Like many parts of Canada, following a record cold winter in Saskatchewan, winter seemed to extend through spring. In early – mid June we finally saw better temperatures. The cold spring delayed seeding and growth of the crops. As I write this I recall some of the earlier seeded canola last year was just starting to bloom and the alfalfa was flowering also. This year we are still a good two weeks away before the start of the early canola honey flow. Conditions across most of

the province were extremely dry going into late June but timely rains were welcomed and alleviated the fears of drought, for the time being, across much of the province.



Corey Bacon

Final winter loses in individual beekeeping operations came in ranging from 7% to 80% across the province. This past winter the indoor wintered colonies losses were substantially lower than those wintered outdoors in most cases. Following two years of higher losses, sampling and testing treatments for efficacy has continued to be a priority for Saskatchewan beekeepers. What we are seeing this year is puzzling. We have beekeepers in the same regions that used the same products (whether formic, oxalic, or the "hard" chemicals), with low mite levels but drastically different winter/spring mortality rates. I can imagine the frustration knowing of beekeepers using the same treatment and similar management practices as a neighbour and suffering a 60% loss while your neighbour sits at 10% loss. It has lead to speculation that nosema is part of the problem or perhaps there is virus issue. We are seeing the potential for formic and oxalic for effective varroa control. However, more work is required to determine best methods of use in the Saskatchewan climate, especially for fall treatments.

The SBA has been pushing the government for more and better programs for the beekeeping industry. It seems our efforts are starting bear fruit. Next week the SBA and the SBDC will be meeting with the provincial apiarists to outline a program for a “tech/research” program in Saskatchewan and discuss funding options. We will also be meeting with government officials from the Ministry of Agriculture Crop Insurance program. Discussions will take place about the creation of a winter loss insurance program, a honey production insurance program and we will also continue to push to have them include our colonies under the wildlife damage insurance program. It is pleasing to see the government taking the appropriate steps to recognize the value of our industry and work to develop programs for our sector of agriculture within the province. It is also positive to see them consulting with the industry to develop these programs instead of ramming them down our throat, only to fail. Hopefully with good two-way communication, programs can be developed that will be meaningful and successful long-term, unlike the two attempts at crop insurance for honey.

The “Saskatraz” project continues again this year to select bees that are genetically better suited to tolerate/resist mites and diseases as well as ensure honey production is a key trait. The “Saskatraz” project continues to evolve. This winter the project

applied for and received funding to investigate establishing isolated “Saskatraz” breeding yards in Chile. The aim would be to continue to propagate selected breeders year round with desirable traits/genetics for the project by working in both hemispheres. From there, through collaboration, pure “Saskatraz” Canadian breeders would be established in isolated valleys in Chile with the end goal of providing “Saskatraz” Canadian stock (queens) back to Canadian beekeepers. Of course there are many obstacles to overcome to make this a reality, including getting “Saskatraz” breeding stock into Chile.

Alberta

Summer was late arriving in Alberta. Some areas had high winter losses again and some areas did not get very much spring weather. The northeast and northwest have been very dry with considerable concern of a drought. These areas had more consistent spring weather allowing for some good build up but due to the dryness, the potential for a good honey crop is not good. Some areas in the south have had better moisture levels, but extremely cool temperatures with snow seen in some areas as late as June 6th.

Moving of bees to pollination started the last week of June. There is strong demand for beehives

in canola pollination, with approximately 70,000 going this season (down from last years 80,000). Some beekeepers enjoy the consistency that pollination contracts bring versus honey production.

Honey prices have been strong to this point with producers receiving \$1.60 to \$1.70 FOB. Prices should remain high as a lot of producers have faced challenges in regards to keeping their numbers up in a period of uncertain climatic conditions. It sounds like there is not a surplus of honey in the world, so if packers in Canada and the U.S. continue buying 100% pure honey, we should be able to see good prices for honey this fall.

Alberta has started a new program where a hive health consultant will come to the farm and sample hives for varroa mite and nosema levels. We believe this could be a huge benefit in helping us see the overall health of our bees in the province. It will also help individual beekeepers monitor their own operations to help them better understand if their treatment practices are working. Often we believe that our bees are healthy but until we start sampling, we do not know for sure until it is too late.

The next few months will tell us a lot of the story as to how successful our efforts have been. Hoping you have a good summer.

British Columbia

Hive losses in B.C. this past winter were higher than normal, with many beekeepers losing between twenty and thirty percent of their hives. A long cold spring combined with a hard winter caused many hives to starve. Beekeepers also reported an increased incidence of nosema in their bees this spring.

In May the weather turned hot and dry and has remained so in June. Many parts of the province have experienced above average temperatures, in the low 30s Celsius. The dry conditions have increased the danger of forest fires and fires have sprung up in many parts of the province. If the hot dry conditions continue they will also cause plants to bloom earlier, resulting in an early, shortened honey flow.

However the hot weather has created excellent queen rearing conditions so hopefully most beekeepers will be able to replace their winter losses.



Ted Hancock



Jerry Poelman

Succession

Does your transfer plan pass this test?

Glenn Cheater, Editor, Canadian Farm Manager Newsletter, June/July 2009

Want to test the strength of your succession plan? Ask yourself: *Is your son or daughter making decisions in the farm business that you don't agree with?*

When Daryl Frank started farming fulltime in 2002, his father couldn't help but shake his head sometimes.

"Back then we were farming a couple of thousand acres – now we've moved up to 4,300 acres," says the 30-year-old. "For Dad it was, 'Why do you want to farm all those acres?'"

Then there was the younger Frank's choice of crops. Spring wheat was a mainstay in Joe Frank's operation at Southey, Sask. for five decades. Today, Daryl Frank hardly grows any, but has a lot of lentils, peas and winter wheat – crops his father didn't grow.

He thinks they'll be more profitable over the long haul, but even if they're not, it's how Daryl wants to do things.

"When you know it's going to be your business one day, you want to build it the way you want," says Daryl. "I still ask Dad for advice pretty much every day on certain things. But at the end of the day, I'm making the decisions. I have friends who don't have that and it's frustrating for them."

For succession expert John Baker, it's a good sign that Daryl and Joe have different views on how to run the farm business – and that Daryl's view is prevailing.

"The idea that you can have a 22-year-old come straight out of university and do your strategic planning is crazy," says Baker, director of the Beginning Farmer Center in Urbandale, Iowa.

"But you should have a reasonable time frame that starts with the young person making tactical, or day-to-day operational decisions. Then he or she should gradually move into management decisions and then finally into strategic planning, those long-term types of decisions."

Daryl Frank says he's lucky because once he decided he was going to take over the family farm business, it was clear that he'd be on a managerial fast track. He's the youngest of six siblings (one's a cattle producer and the others aren't in farming) and Joe, now retired, was already in his early 60s when Daryl graduated from high school. So when he chose farming as a career, the time frame

for handing things over was short.

But there was still enough for a proper transition.

Daryl, who is also an ag machinery technician, first worked off the farm at a farm supply company in Southey, 60 kilometres north of Regina, and came back during seeding and harvest.

That was when Daryl went through what Baker calls the tactic phase. By the time he returned fulltime, he was making management decisions – such as which equipment they would jointly buy – and beginning to make strategic decisions on expansion.

"Because Dad knew he was getting out of farming, he was letting me make decisions," says Daryl. "I feel lucky because our succession process was pretty easy. I have friends who have nothing in place. I don't think people realize how important this is." Actually, a lot of them do. Hundreds have come to the Beginning Farmer Center, part of Iowa State University's extension services. Baker says the vast majority would respond with an emphatic 'yes' to this second succession test question: Are you excited about the future of farming?

"I think the people who come to the center are self-selecting," says Baker. "They are people who are optimistic about the future of agriculture. This is something they really want to do and they're excited about it. So succession is something they want to get on with."

A lot of farmers in their 40s or early 50s come in with their dad to consult Baker. Only they're not there to work on their succession plan – that's already done. They're coming in with their 21-year-old son or daughter to start work on their next succession plan, says Baker.

Baker has another succession test question: Which member of the family has the chequebook?

"Businesses are run on the golden rule: He who has the gold makes the rules," he says. "So if Dad is writing the cheques, then who is running the business?"

Baker can be blunt with farmers who are holding fast to both the decision-making and the chequebook.

"I tell them, 'This is a free country. These are your assets and you can do whatever you want with them. But don't you tell your child they're going to be your successor and then say I'm never going to retire.'

"That's not appointing a successor. That's selecting an heir. Be honest and tell your successor the truth.

"And the truth in that case is that if the successor wants to operate his or her own farm business, they're going to have to go someplace else do it. It's never going to happen on the family farm."

John Baker will be one of the presenters at the 2009 Farm Succession Conference being held Aug. 26-28 at the Chateau Frontenac in Quebec City. For more information or to register, go to <http://www.farmcentre.com>

The website of the Beginning Farmer Center is www.extension.iastate.edu/bfc

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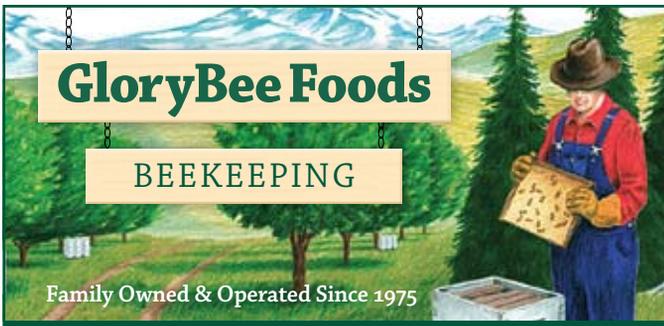
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First ever annual "Saskatoon Day of the Honey Bee"

June 23, 2009
Clinton Shane Ekdahl
129 Avenue E South
Saskatoon, SK S7M 1R7
Canada, 1 (306) 651-3955
ccssssee@hotmail.co.uk

The City of Saskatoon, Saskatchewan, Canada will have the pride of being the first municipal government in the world to sign a proclamation to declare May 29, 2010 as the first annual, "Day of the Honey Bee". This is the first step of many in the right direction, I hope, with regard to creating greater awareness and concern for the Honey Bee.

Honey Bees are disappearing all over the globe and my goal is to ensure that the general public is made aware of the risks to these insects that, I would argue above ALL

other domesticated flora and fauna, is the most important in the history of mankind. It is commonly said that one third of all the food we eat exists because of Honey Bees and regardless of the exact ratio, it can not be argued that their influence to our agriculture, economy and environment on a global level is not only profound but also crucial to our survival.

With great respect I wish to thank his Worship the Mayor of Saskatoon, SK and Members of Saskatoon City Council (His Worship the Mayor, Donald J. Atchison and Council

Members: Darren Hill, Pat Lorje, Maurice Neault, Myles Heidt, Gordon Wyant, Charlie Clark, Bob Pringle, Glen Penner, Tiffany Paulsen and Bev Dubois).

With their aid, I have succeeded in the first of four objectives. I would also like to thank the Saskatoon Food Bank and the Roxy Theatre for their support, advice and encouragement in this venture.

I began this endeavor on May 29, 2009 and have given myself the goal of one year to accomplish four objectives, that on a municipal, provincial, federal and international level, May 29, 2010 is recognized as "Day of the Honey Bee."

It is my desire that other Municipalities across Saskatchewan, Canada and the world follow our lead in Saskatoon, SK and make similar proclamations declaring May 29, 2010 as the first annual "Day of the Honey Bee".

My remaining three objectives are:

1) To convince each Province, beginning with Saskatchewan, that a province-wide proclamation of May 29 as annual "Day of the Honey Bee", is in the best interests of its citizens and to the Honey Bee.

2) To convince the Federal Government of Canada to proclaim May 29 as annual "National Day of the Honey Bee."

3) To convince the United Nations to proclaim May 29 as annual "International Day of the Honey Bee."

With each successive level of government making such proclamations in honor of the Honey Bee, we will have the desired effect of alerting the general public to the concerns and issues surrounding their disturbing disappearances across the globe. In addition, the general public will have a greater understanding and appreciation of where their fresh produce comes from.

If more people are made aware of the dire threats facing Honey Bees, then perhaps more funds can be made available towards research that may not only find the cause of their disappearance but also to discover a solution. A threat to the Honey Bee is a threat to us all.

I invite all citizens across the world to join Saskatoon, SK, Canada in making May 29, 2010 a day to remember.

Thank you,
Clinton Shane Ekdahl

For more information and a template for a letter to the P.M. of Canada visit:
www.saskatchewanbeekeepers.com



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CBRF Grants announced

CBRF Board of Directors

The Canadian Bee Research Fund (CBRF) was established to counteract the problems caused by severe reductions in federal and provincial funding for honey bee research.

It is a joint project of the Canadian Association of Professional Apiculturists and the Canadian Honey Council.

The CBRF is entirely supported by donations. Beekeepers influence the type of research that they want to support through participation of two members in the decision making by the board of directors of the CBRF. It is a unique partnership between CAPA researchers and CHC members.

This year the directors are pleased to announce a total of \$18,100 has been awarded for three research projects.

Pernal S., A. Melathopoulos, J. Pettis, T. Thompson,
Integrated Management of *Nosema* & Detection of Antibiotic Residues,
\$6,957

Robertson, A., J. Gruszka, T. Wendell, J. Pedersen,
The Saskatraz Project: Selection of Productive Honey Bee Genotypes with Tolerance to Varroa and Tracheal Mites and Development of Molecular Markers,
\$5,143

R. Currie,
Cultural and chemical treatments to synergize honey bee resistance mechanisms against the parasitic mite, *Varroa destructor*, and the diseases it vectors,
\$6,000

Wanting Job:

South African currently working in USA as a beekeeper for past 3 seasons is looking to be sponsored for work permit in same occupation.

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Contact: Hennie van der Berg

Tel: 605 270-3683

E-mail:
janvanderberg@hotmail.com

Pollinating Hybrid Canola-the Southern Alberta Experience

Heather Clay, Chief Executive Officer, Canadian Honey Council, Calgary, AB

Originally presented to NSW Apiarist Association, State Conference, July 10, 2009.

Canola is a Canadian success story. This oilseed crop has brought prosperity to many canola growers in the prairies. Over the last few years it has also contributed to an unprecedented growth in the number of honey bee colonies for pollination of hybrid seed canola. There are many challenges to supplying bees for pollination on time and on budget. Following is an overview of the canola industry and honey bee pollination.

Canola is an oilseed crop that was developed in Canada from a low acid cultivar of rapeseed. The species name is *Brassica napus* and this is the main species grown. *Brassica rapa* has a shorter growing season which is great for some areas of Canada but it does not yield as much oil as *B. napus*. The name Canola comes from the term CANadian Oil Low Acid. There is a strict definition of canola, which has been codified in Canadian law. It only applies to an oilseed that has less than 2% erucic acid (a crystalline fatty acid that is not good for your heart) and less than 30 micro moles of glucosinolate (a compound that binds some unpleasant tasting alkaloids that are released on eating).

Development

The crop was developed in the 1960's by plant researchers Dr Keith Downey, Agriculture Canada, Saskatoon and Dr. Balduf Stefansson, University of Manitoba, Winnipeg. Canola was introduced to Canadian farmers in 1968. In the race to develop the low acid varietal, technicians, Martin Mallard and Burton Craig at the University of Saskatchewan built a gas chromatograph before the equipment was commercially available. This innovation saved a month of turn around time in sending samples away for testing for erucic acid and

glucosinolate levels. Interestingly there is a beekeeper connection, Paul Pawlowsky, manager of the Honey Co-op had a brother Sid who worked for Keith Downey on the canola program, the Pawlowskys supplied the bees for the pollination trials.

Production

Canola is grown commercially mostly on the prairies in Canada. In 2008, 16.6 million acres (6.6 million ha) were planted and the acreage is expanding. There are 52,000 canola producers. Canada is the largest single producer of canola in the world.

Production was 12.6 million tonnes of canola seed in 2008 at a value of \$13 billion. Some of the crop went to the 13 crushing plants in Canada and was sold as meal for animal feed and oil for the food industry (canola seed has 42% oil and 58% meal). Some of it was shipped as seed for production of biofuel. Some of it was sold as certified hybrid seed canola. Some seed is sent to Australia or South America to grow in the opposite season to be returned as parent seed for the following year in Canada. Sixty percent of Canada's exports of canola meal are to the USA. They are a net importer of canola. Almost half of the canola oil seed crop was shipped to China in 2008/9. Japan, USA, Mexico and Saudi Arabia bought the rest. Production is expected to be down in 2009 so the record exports may not be repeated.

What is in a Name?

Over the past fifteen years some innovations were made using recombinant DNA technology for producing seed with herbicide tolerance. This has created a lot of controversy. The terms transgenic, genetically modified, genetically transformed, genetically engineered have been used in very

derogatory ways to describe the new bio engineered seed. Some EU countries have banned GM products. Some have gone so far as to call it "frankenfood". To this group of detractors, Percy Schmeizer, a canola farmer from Humboldt Saskatchewan is a hero. Monsanto claimed he was growing their product without paying the royalties. Percy claimed the wind and bees contaminated his plants with pollen from neighbouring GM crops. The judge believed Monsanto but Percy is making money as a guest speaker in countries such as UK and India and providing them with anti GM information.

On the other hand canola that has been bio engineered is also called less inflammatory names such as PNT (plants with novel traits), high yield, non conventional, herbicide tolerant, pedigreed canola and the most commonly used and politically correct term is hybrid canola. Interestingly, the religious Hutterite colonies who farm communally live a simple life and believe in low impact farming, have embraced hybrid canola because they believe it saves excessive amounts of pesticides and herbicides.

The Players

The main players in the Alberta hybrid seed industry are Monsanto with Round Up ready seed, BayerCrop Science with their Liberty Link seed, and Pioneer Hi-Bred which grows BASF brand Clearfield variety. Hi Tech Production grows seed for other companies and is a smaller company among the giants. Around 50% of the canola seed planted in Canada is Roundup Ready, 30% Liberty Link, 15% Clearfield (not GM but a mutagenic variety) and 5% are conventional. All of the seed companies have seed production units and all employ agronomists to advise the farmers and supervise crop production.

Canola and Bees

Commercially grown canola is predominantly a prairie crop. It is so common that 80% of Canada's honey crop is from canola. This amounts to

50 million lb per year of Grade No 1 white honey. It is almost impossible for bees to avoid encountering GM plants. However in 15 years of GM canola production there have been no verified complaints about the effect of GM crops on honey bees. Approximately 300,000 colonies harvest open pollinated canola. The expanding hybrid seed production industry, where farmers produce seed under contract to the seed companies, required 80,000 colonies in 2008 for pollination in southern Alberta.

Canola Requirements

Hybrid seed canola is grown in southern Alberta. Although other areas in Canada meet a lot of the criteria, this area meets all the requirements for heat, water, soil and isolation. The zone is centered around the 13 irrigation districts between Lethbridge in the south to Calgary in the north and east through Brooks and Medicine Hat. Here water is readily available to provide the 19 inches (480 mm) required by this crop. Days are mainly sunny, day length is 18 hours and there are sufficient degree days for rapid growth. Farms are measured in sections (640 acres) which provide good isolation for canola varieties.

Canola Planting

Seeding canola starts in late May. The parent stock consists of two genetic lines. They are planted in rows or "bays". The bays are planted in a ratio of 1:3 or 1:4 male to female plants depending on the company preference. The female flowers are male sterile so pollen must be transferred from a plant in the male bay. The crop is 90% dependent on honey bees. Honey bees are introduced at day 45 to provide this pollen transfer. Plants in the male bays will produce seed if left but they are mowed early to eliminate any potential for unwanted seed. The crop is certified by Canadian Food Inspection Agency inspectors for isolation, rogue plants and plant type.

Spraying

The agronomists advise when and where the sprays will be applied. Usually the crop is dusted with a

fungicide to prevent sclerotinia, a month before the bees are brought in. If there is a need for an insecticide during pollination period the agronomist will order Decis®, a low risk pyrethroid. Most canola seeds are now treated with systemic insecticides such as Gaucho® (imidacloprid), Poncho® (chlorothianidin) or Helix® (thiamethoxan). Although there is an expressed concern by many beekeepers around the world about the use of systemics, the experience in Canada is that we have had 10 years of large scale use on canola with no observed ill effect. This is not to let the systemics off the hook as there are some valid concerns about the application methods and residues in some other crops. In the past there were more complaints from beekeepers about Lorsban (chlorpyrifos, an organophosphate) and Sevin (carbaryl or 1-naphthyl methylcarbamate). For canola, the seed treatments, when applied according to label specifications do not appear to be an issue.

Contracts

All seed companies have contracts with growers and beekeepers. For the beekeeper it lays out the expectation for timing of arrival and departure, as well as the arrangement of payment depending on colony strength. Fees range from \$110-\$150 for 10-17 frames of bees and the quality is verified by the seed company.

Timing

Timing is very important as the crop is in bloom 45 days after seeding. Honey bee colonies are moved in to the fields over a period of 10 days starting June 20th. They are moved out again starting July 20th. While on the field the colonies are supered twice.

Challenges

There are many challenges for the beekeeper pollinating hybrid seed canola. Like any pollination venture it is a high capital investment. It requires an investment in moving equipment, forklifts, and trucks as well as a palletized system for the hives. Larger trucks bring their own issues with

need for driver training and Class 3 licences and adequate road access.

Staff is a big issue. Day length can be 18 hours and the work intense. Workers often prefer to work 12-14 hour days and have time off rather than work in shifts. Local seasonal workers are hard to recruit in rural areas and there are not enough young people interested in working in the apiculture business. Foreign workers are frequently hired to fill the gap. They come from Spanish speaking countries such as Mexico, Central and South America and the Philippines. This brings its own problems of language difficulties, housing and transportation, not to mention the hassles with government departments such as Health Canada, Human Resources and Immigration Canada.

In southern Alberta it can still be light at 11 PM in mid summer. Trucks usually move bees between 11PM and 4 AM. Since canola is rotated on a four year basis, the drop off for pollination is different for three years in a row. GPS is an important piece of equipment to help new crew find the fields. One beekeeper reported arriving to find hives already at the location. He was upset at the waste of time and walked in to see whose bees they were. It turned out they were his. He had dropped them off, via a different access road and then drove a full circle to what he thought was the next drop. Access can be a problem in the middle of the night, finding unlocked gates and setting down in the right spot. Agronomists want the best coverage for pollination. It has been known that beekeepers have been instructed to drop off in the centre of a field. The next day the hives were soaked because it was also the centre of the pivot irrigation. Of course there is the problem of mud if it has been raining and prairie soils are, to quote a local expression, "slipperier than snot".

A problem disease called clubroot is spreading. Beekeepers are now asked

to use hygienic practices by washing their trucks and equipment between yards to help prevent the spread of the disease. This adds time an effort to each trip.



Hybrid canola parent stock are planted in "bays".

Photo: Jerry Poelman

Agronomists are very knowledgeable and are hired for their expertise. Generally things go smoothly especially with experienced agronomists who know where and when to place honey bees and who appreciate the need not to spray when bees are in the field. Some of the larger beekeepers can work with 10 different agronomists each wanting a different sequence of events.

A lot of agronomists want 50% honey bees and 50% leafcutter bees for pollination. It can be disconcerting for the beekeeper to drive in and find leafcutter shelters placed where the honey bees are to be dropped.

Very little nectar is collected from hybrid canola and the fee for rental reflects this fact. The crop can vary from 10-50 pounds (2-22 kg) per colony depending on canola variety, nectar sources from plants in surrounding fields and the stocking density. Canola honey crystallizes quickly and this has to be built into any management routine. Supers must be removed and extracted in a short period.

With 1-3 colonies per acre (3-8 colonies/ha) the nectar sources are quickly harvested. Stocking density is so high that 1200 colonies can be within a square mile. Colonies sometimes go home lighter than they arrived.

Honey collected from canola is a light

white <10 mm on the Pfund scale. It is in high demand in the USA. Export markets to Europe were affected in the past by anti GM protestors but with the approval of GM crops for the EU, public perception of hybrid crops is changing.

Advantages

On the positive side canola pollination guarantees an income. Banks that loan money to beekeepers, like to see a good cash flow. The stability provided by canola pollination contracts is an important factor in providing financing for the expansion of business.

The irrigation districts in southern Alberta are generally used for growing corn, beets and potatoes, none of which provide forage for honey bees. Canola provides an income from honey production and pollination in a normally low yield area.

A well organized pollination business is hard work, almost 24-7, for six months of the year. The reward at the end of the year, if all goes well, is a good income and an opportunity to take a winter holiday.

Role For the Seed Companies

The seed companies have researchers engaged in producing newer high yield varieties with traits for a healthier human diet. We beekeepers must remind those in the lab that it is also important to maintain the physiological structure of flowers that is necessary for effective pollination. The flowers must be attractive to honey bees. This means maintaining a good pollen source in male flowers, good nectar source in female flowers, as well as petal size and attractiveness of the flowers.

This year in southern Alberta, Bayer CropScience is working co-operatively with Alberta Agriculture to collect samples from hives when they are checked for hive quality at pollination time. It is this kind of partnership that will provide a benefit to beekeepers as well as the seed industry.

There is awareness in seed companies

of the need to improve pesticides without killing honey bees. We encourage them to pursue research into species specific insect repellents and hope that this will be the way of the future

The Future

The seed companies have scientists performing ongoing research into a variety of different traits for canola.

One trait is high oleic acid, a monounsaturated fat that is good for cholesterol levels. The oil from this plant does not require hydrogenation (the process that turns oil into solid fat and produces nasty trans fats that are not good for you). Some varieties are bred for lower linoleic acid which is a less desirable acid.



Beehives in canola, southern Alberta.

Photo: Jerry Poelman

Omega 3 is a healthy choice and there are now some canola varieties that have enhanced Omega 3 oil, which will please dieticians. Some varieties have been found that have low nitrogen requirements, which is a bonus for not having to use large quantities of fertilizer. In an age of reducing our carbon footprint, this genetic trait is valuable. Work is currently underway by industry to produce a seed that has genes for herbicide tolerance, insect resistance, is oil enhanced and low in nitrogen requirement. It is estimated that in 10 years time, 50% of the hybrid canola will have these new traits.

The future is bright for canola growers and for beekeepers supplying the necessary pollination services. Despite the hard work and the challenges, the rewards are worth the effort.

Plants For Bees: Blueberry

Douglas Clay, Research Scientist, Calgary, AB

Common Name: Blueberry
(Highbush and 'Wild' or Lowbush)

Scientific Name: *Vaccinium corymbosum* L. and *Vaccinium angustifolium* Aiton.

Native Range and Canadian Distribution:

The genus *Vaccinium sp.* has a circumpolar distribution with species in North America, Europe and Asia. The two types of blueberries most commonly harvested in Canada are the highbush (*Vaccinium corymbosum* L.) and the lowbush or 'wild' blueberry (*Vaccinium angustifolium* Aiton.). Both species are members of the Ericaceae or heath family. The Ericaceae live in temperate climates and include other species such as American cranberry (*Vaccinium macrocarpon* Aiton.) small cranberry (*Vaccinium microcarpum* (Turcz. ex Rupr.) Schmalh.), various heaths, heather, huckleberry, azalea and rhododendron.

The highbush blueberry 'complex' is highly variable and includes diploids, tetraploids, hexaploids, and various hybrid combinations. It has long been a subject of taxonomic confusion and controversy. Numerous taxonomic treatments have been proposed. In 1945 it was proposed to classify the highbush complex into 12 species. This classification became widely accepted but in more recent years it has been accepted that the 12 should be considered one species again.

Lowbush blueberry is native to the Atlantic provinces, central Canada, Manitoba and the northeastern United States, growing as far south as West Virginia. Highbush blueberry is a more southern plant, native from Illinois and Indiana northeastward to Nova Scotia, south to Florida, and west to Texas. It has been introduced to BC and New Brunswick for cultivation.

BC produces over 90% of the highbush blueberry crop in Canada. Over 99% of commercial blueberry production in BC is located in the lower mainland region, with the remainder on Vancouver Island. In Nova Scotia, the bulk of the production of highbush is in the Annapolis Valley. In addition Nova Scotia produces 16,000 tonnes of lowbush blueberries, about half of Canada's crop. Oxford, NS is considered the wild blueberry capital of Canada. New Brunswick produces about 4,200 tonnes of wild berries on about 8,500 ha.



Blossoms of Highbush Blueberry
Photo: Kwantlen Polytechnic University, Langley, BC

Description:

The 'wild' blueberry is a low-growing, ground covering, perennial shrub that reaches 5 - 60 cm in height. The highbush blueberry is a perennial, deciduous, woody many-stemmed upright shrub growing to a height of 1.5 - 4.5 m – well suited to orchard management. The commercial cultivars were developed by selective breeding from the native blueberries by the USDA in the first half of the 20th century.

A distinguishing feature of blueberry is their alternate elliptic leaf, 4 - 8 cm long, smooth above, sometimes hairy beneath. The leaves are glossy blue-green in summer, turning purple or red in the fall.

The flowers are small, 6 - 13 mm long, the white or pink-tinged corolla is 5-lobed bell shaped, appearing when leaves are about half formed.

Flowers are borne in short, few-flowered terminals or axillary racemes. Lowbush blueberry flowering season is May to June with the fruit ripening July to August, while *V. corymbosum*, in the southern portion of its range, flowers sporadically over a 2 to 3 month period. In Canada flowering of highbush is synchronous and lasts a maximum of 25 days. Fruiting begins about 62 days after flowering. Flowering of highbush blueberry occurs in southern Ontario - mid-May to early June, eastern Ontario and Quebec - early June to late June, and southwestern Nova Scotia - mid-June.

The fruit is a globular berry averaging 4 - 12 mm in diameter. Some cultivars produce fruit up to 2.5 cm in diameter. The berries are very sweet, blue to blue-black with a pale grey bloom. Each contains numerous nutlets averaging approximately 1.2 mm in length. Plants generally first flower at approximately 2 to 4 years of age.

Lowbush blueberry typically forms dense, extensive colonies. Roots are shallow and fibrous but may possess a taproot, which can extend to 1 m in depth. Woody rhizomes average 4.5 mm in diameter and 6 cm in depth.

Ecology:

Highbush and lowbush blueberries hybridize resulting in many hybrids. Both blueberries have been cultivated and can be very important to wildlife. The berries feed many types of birds, bears and small mammals.

Lowbush blueberry is found in a variety of habitats from swamps to dry upland woods throughout Quebec to Nova Scotia. It occurs as an understory in a variety of forest communities and on the 'barrens' of Atlantic Canada as well as the exposed rocky outcrops of the Canadian Shield. Shade is detrimental to the growth of lowbush in the Atlantic Provinces but is necessary for optimal growth in Manitoba's dry, sunny continental climate. 'Wild' blueberries can tolerate soil pH of 3.9 to 5.3 but prefer about 4.8.

Highbush blueberry is wide spread but seldom occurs as community dominant. Two habitats where it can be dominant are open swamps or bogs and high-elevation balds (grassy slopes above the tree line in more southern latitudes).



Fletcher Colpitts (right) beekeeper and David Hatt blueberry grower, Pennfield NB

Photo: Heather Clay

Highbush blueberry is intolerant of shade, generally found at lower elevations along the edges of swamps and bogs, sandy margins of lakes, ponds, and streams, and within open areas of moist woods. It grows best on hummocks or raised bogs which provide moist, acidic, well-aerated, highly-organic soils. Acidic soils are preferred, with pH between 2.7 and 6.6 with low fertility. Plants can withstand extended periods of flooding.

Methods of Reproduction and Spread:

Both blueberries reproduce from seed of the annual fruit crop. Managed colonies of honey bees are generally used as the primary pollinator. Pollen from blueberry is sticky and heavy and not easily transported by wind. Many solitary bee species associated with blueberries sonically vibrate the anthers (often referred to as 'buzz pollinating'), causing the pollen to be released. Honey bees cannot do this and therefore collect less pollen from the anthers at each visit than many of the solitary bee species.

The seeds are dispersed in the droppings of frugivorous birds and mammals. Long-distance dispersal is rare because most animals which consume blueberries are territorial.

Even when fruit ripening coincides with migration of songbirds, dispersal distances are short because berry pulp rarely stays in the gut of birds for more than 20 minutes. Speculation suggests that the fruit ripening patterns of blueberry may be related to the nutritional needs of avian seed dispersers. Mass fruiting in the north occurs in mid-summer when avian dispersers are numerous.

The seeds have thick coats and require cold stratification before germination can occur. In the southern extent of the range germination typically occurs in the winter following spring dispersal while in the

northern latitudes the seeds have thinner seed coats and germinate in the autumn shortly after dispersal.

Highbush blueberry rarely produce rhizomes however in eastern Quebec and Ontario where it introgresses with lowbush blueberry it may sometimes 'layer' when "disturbed or burnt". The plant will occasionally produce new plants from root sprouts 1 - 2 m away from the parent. Lowbush on the other hand can be readily propagated from hard, semihard, and softwood cuttings, and from rhizome segments. Cuttings can be used where rapid propagation is desired.

Honey/Pollen Potential:

Lowbush is the most important commercial blueberry in Canada and the northeastern United States. It is grown commercially in Ontario, Quebec, New Brunswick, Nova Scotia and Maine. A major portion of the crop is gathered from 'managed' wild stands, often on crown lands, where honey bees are used for pollination.

Cross-pollination by insects is

necessary for a good fruit set. Without insect pollination fruit set is less than 52 % while in cross-pollinated plants the range is 81 to 90 %. In some areas, the widespread use of insecticides has decimated native wild bee populations. Although honey bees are less effective pollinators than wild bees, managed colonies have higher numbers of bees and fly at lower temperatures than native bees. Growers generally contract commercial pollination services to bring in hives of honeybees in an effort to improve fruit set and thus yield. The recommended stocking rate is 2 to 6 colonies/ha. Shrubs with relatively few flowers often fail to attract pollinators, and plants with fewer than 30 flowers rarely produce fruit. Productive plants may bear more than 400 flowers.

'Wild' blueberries in eastern Canada are often raised on marginal lands with poor soils. Pollination is required early in the beekeeping year. Many beekeepers consider blueberry pollen to be of poor nutritional value for honey bees as it is low in total protein content and low in some amino acids. There is concern about possible increased rates of European foulbrood while on the blueberry barrens. Honey yield on lowbush blueberry can be 7 - 16 kg/colony but can also be zero after a cool overcast spring. Highbush has a higher density of flowers and is generally grown in a warmer climate



Swinger unloading hives on blueberry fields, Lac St Jean QC

Photo: Peter Keating

and thus has a higher honey yield ranging from 22.5 - 45 kg/colony. The nectar flow generally lasts 8 to 10 days. The honey is light to amber and often granulates quickly.



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Blueberry for Health

The principal components of blueberries are water, natural sugars, crude proteins, vitamins, trace minerals, fats (in seeds) and fiber. The fruit is a good source of vitamin C, containing 14 mg per cup of berries. The energy found in seed and pulp portions varies considerably among geographic locations. Northern plants produce fruit with low seed energy and high pulp energy, while southern plants produce fruit with high seed energy and low pulp energy.

Blueberry caloric values for three regions are: Florida - 52 calories/berry, Nova Scotia - 141 calories/berry, and Ontario - 184 calories/berry.

Blueberries contain phytochemicals that act as cancer inhibiting antioxidants. Data from the USDA Human Nutrition Research Center on Aging (Boston, MA) shows blueberries are among the fruits with the highest antioxidant activity. Phytochemicals such as anthocyanin, proanthocyanidin, resveratrol, flavonol, and tannin that prevent damage to cells by free radicals are present in blueberries. Consumption of blueberries (and similar berry fruits including cranberries) may also alleviate the cognitive decline occurring in Alzheimer's disease and other conditions of aging. Feeding blueberries to animals has been shown to lower brain damage in experimental stroke. Researchers at Rutgers University in New Jersey have identified compounds in blueberries called proanthocyanidins that promote urinary tract health and reduce the risk of infection by preventing bacteria from adhering to the cells that line the walls of the urinary tract.



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An update on the development of real-time PCR to quantify co-infections of *Nosema apis* and *Nosema ceranae* in honey bees

Karen Burgher-MacLellan¹, Geoff Williams^{2,3}, Kenna MacKenzie¹, Dave Shutler³, Dick Rogers⁴

¹ Atlantic Food and Horticulture Research Centre, AAFC, Kentville, NS

² Department of Biology, Dalhousie University, Halifax, NS

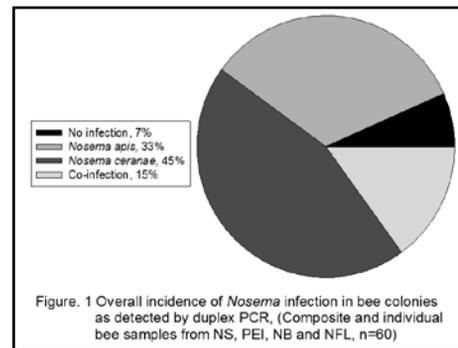
³ Department of Biology, Acadia University, Wolfville, NS

⁴ Wildwood Labs, Kentville, NS

It's well documented that honey bees (*Apis mellifera*) can be parasitized by two microsporidians – *Nosema apis* and *Nosema ceranae*. Many years of research have provided for a relatively good understanding of *N. apis* biology and pathology; however, relatively little is known about *N. ceranae* because of its recent detection, first in Taiwan in 2005, and in Canada in 2007. *Nosema* infections are typically detected using light microscopy to view worker abdomens crushed in water. Because *N. apis* and *N. ceranae* spores are morphologically similar, it's likely that *N. ceranae* went undetected in this country for decades. To distinguish between the two species, researchers employ species specific conventional PCR (polymerase chain reaction) molecular techniques. These techniques are capable of simultaneously determining presence of both species in a single sample, but not intensity (i.e., spores per bee). Therefore, spore counts determined using light microscopy for co-infected colonies cannot be made for each species, but rather for *Nosema* only. Because colonies in Canada are known to be co-infected, and because *N. ceranae* is believed to be more pathogenic than *N. apis*, it would be extremely useful to determine accurate levels of both *Nosema* species simultaneously using duplex

real-time PCR molecular techniques.

In the fall of 2007 and spring 2008, we determined *Nosema* intensity by light microscopy for samples of worker bees collected from



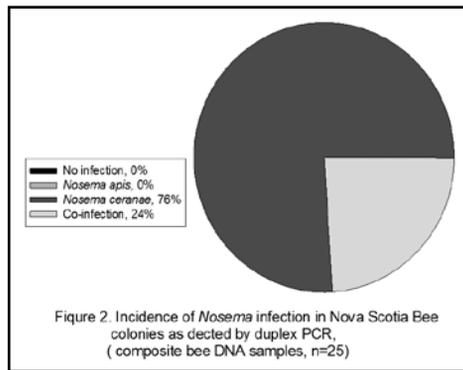
colonies in Atlantic Canada (New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland). DNA from sixty samples was purified from 28 individual and 32 composite bee samples. Conventional PCR was optimized and overall the data showed that 45%, 33% and 15% of the samples were infected with *N. ceranae*, *N. apis*, and co-infection of both *Nosema* species respectively (Figure 1). Four of the samples (7%), all from individual bees, had no PCR product thus indicating no infection. The DNA samples from Newfoundland (16% of the collection), exclusively showed infection of *N. apis* in all individual and composite bee samples.

The data from Nova Scotia (n=34, Figures 2 and 3) showed that all colonies represented by composite

samples were highly infected with *N. ceranae* where as infection from *N. apis* alone (12%) or no infection (3%) was found only in individual bee samples.

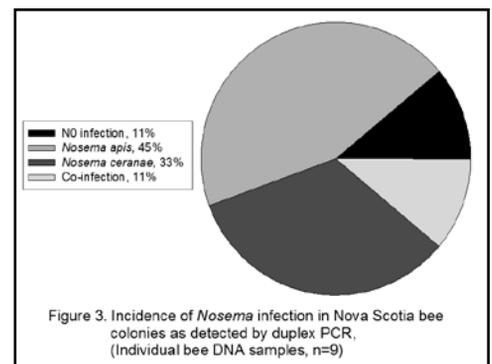
Results from

conventional PCR techniques are visualized with agarose gels where the PCR products are



determined as bright bands of various size and intensity. Real-time PCR method results are obtained as graphs and data files and the PCR products can be verified and quantified with comparison of appropriate standards.

The results can also be confirmed by agarose gels and compared with other PCR results. To date we have optimized the *Nosema* species-specific PCR conditions for duplex real-time PCR and found that the method is fast and very sensitive for identification of *Nosema* infection and co-infection in complex DNA samples from bees. The real-time PCR values for the target DNA (*N. apis* and *N. ceranae*) were correlated with the total spore count for each bee sample and observations from graphs and gel analysis indicated that in all co-infected samples, *N. ceranae* was more prevalent. The completion of this research will further optimize real time PCR methods by developing pure standards for absolute quantification of *N. apis* and *N. ceranae* in bee DNA samples from experimental colonies. The results from this research will assist with the understanding of *N. apis* and *N. ceranae* infection in western honey bees.



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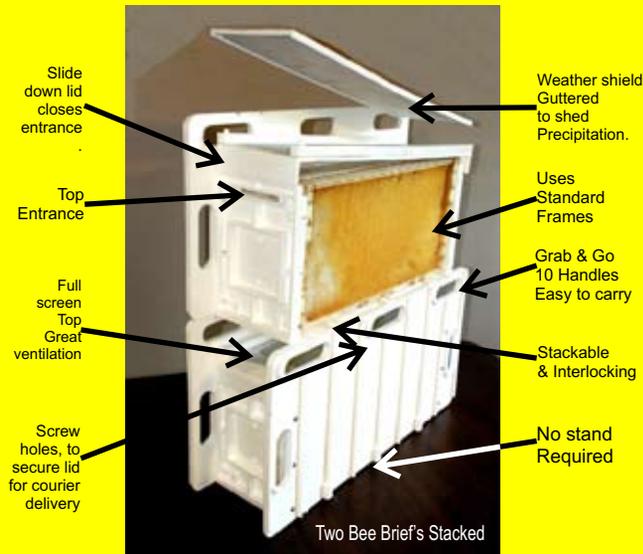
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Is it a bee? Is it a cab? No, it's Beecab!

Beespoke taxi brings a buzz to London's streets ahead of Festival, the festival that celebrates the art of being an insect

Press release 18 June 2009

A London taxi has been specially customized by artists and scientists for Festival, a unique festival coming to London's Southbank Centre in September 2009 to celebrate insects in the arts and the art of being an insect.

The theme of this year's Festival is the collapse of bee colonies around the world. To raise awareness of the plight of bees, one of London's iconic black cabs has been transformed into a bumblebee in full flight, and even has a working beehive in the front seat.

BBKA beekeeper and 'Beecab' driver, Steve Benbow, said: "Bees and cabbies have more in common than you might think – the way bees navigate is very similar to the way cab drivers use The Knowledge to get round London. They both service the city, and with the Varroa mite wiping out wild colonies of bees, urban beekeeping is more important than ever. Bees are vital for the pollination of flowers and fruit in the capital, and beekeepers are the only way the population of honey bees can be maintained in London."

Beecab will be appearing around London until the end of the summer when it arrives at Festival 2009, where highlights will include the Termite Pavilion, a 6-metre cube on the South Bank showing the intricate design of a termite mound; artist in residence, renowned Japanese artist Noboru Tsubaki; a mobile brownfield site created by Bob and Roberta Smith to provide a safe haven for the capital's insects; and evening entertainment from the likes of musician Robyn

Hitchcock and comedian Robin Ince.

The Wellcome Trust, which recently launched a funding scheme for scientific research into the disappearance of bees and other pollinating insects, is supporting Festival.

Pat Goodwin, Head of Pathogens, Immunology and Population Health at



the Wellcome Trust, said: "The decline in bees and other pollinators may devastate our environment and would almost certainly have a serious impact on our health and wellbeing. As well as funding research into the reasons behind the decline in pollinators, the Wellcome Trust is delighted to be supporting Festival, which will engage everyone with the vital role insects play in maintaining our way of life."

Festival Founder and Director, Bridget Nicholls, said: "Insects are critical to human life on Earth. With

over a million insect species, they are the most diverse group of animals on Earth. And yet insects are frequently misunderstood, reviled or ignored by the majority of the human population. Festival will challenge stereotypes about insects and give them their rightful place, for good and bad, in our collective cultural consciousness."

Valerie Singleton OBE, a member of the Festival Advisory Panel, said: "Since I moved to the country, I've really learnt to appreciate how many insects live along side us. I think Festival is a wonderful idea, especially now with our bees, those vital pollinators, in such peril. The timing couldn't be better!"

Festival is also generously supported by Arts Council England, The City Bridges Trust, The Royal Commission for the Exhibition of 1851, and is a Japan-UK 150 Event.

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Above, picture taken
February 14, 2008 (TX)



Below, picture taken March
18, 2008 (TX)

Business Manager - New Position

Canadian Honey Council, dedicated to the profitability and sustainability of the Canadian honey bee industry, is looking for a capable, creative and energetic Business Manager to join the national office in Calgary.

The Business Manager is responsible to the Chief Executive Officer and will assist the CEO with:

- Strategic, financial and operational planning
- Board support, particularly for Finance Committee
- Promotion of the organization and the honey bee industry

The major responsibilities of the Business Manager include:

- Securing resources to fund the organization
- Management of the Sponsorship Program
- Monitoring, analysis and reporting of financial performance
- Project proposals and coordination

If you have appropriate University education, at least at the Bachelors level, business and management training, proven written and verbal communication skills and a demonstrated ability to work in a team environment you are eligible to apply.

Preferred applicants will have extensive knowledge of business administration and project management, some knowledge of the Canadian honey bee industry (or other Canadian commodity groups) and at least 5 years related work experience demonstrating increasing levels of responsibility. Financial management, fund raising, business and event planning experience is desirable. Fluency in French would be an asset.

Deadline for application is 31 August 2009

Send covering letter and resumé to:

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Prophylactic Use of Antibiotics

Paul van Westendorp, Provincial Apiculturist, BCMAL, Abbotsford BC

This issue of prophylactic (preventative) use of antibiotics has been a difficult one. Occasionally, I have started out at producer meetings with the question who in the audience is taking an antibiotic as a precautionary measure against a future infection of some sort. Of course, they look puzzled because nobody does take antibiotics for that reason. Yet, we do so in our beekeeping (as well as in swine production, poultry, etc, etc.).

Here in British Columbia, we have advised beekeepers not to use antibiotics prophylactically for a dozen years or so. There are still many beekeepers that do use it that way, regardless of our recommendations. However, we changed our policy when in 1996, r-AFB was first diagnosed in the Fraser Valley. It made us realize that the strategy of using oxytetracycline prophylactically allowed beekeepers to use the drug indiscriminately, irresponsibly and without good cause. Prophylactic use also accommodated lazy beekeeping practices by allowing beekeepers to forego the basic "good management practices" such as regular examination of brood frames and the culling of frames with infected cells. In addition, we felt that without changing our drug management strategy "nature would eventually take care of it" by rendering oxytetracycline ineffective.

I am aware that the response strategy of some in the industry has been to start using another antibiotic. In Alberta, Tylosin has become a very effective alternative and with careful use according to label instruction, it is safe. In principle, there is nothing wrong with industry starting to use another antibiotic as long as the overall strategy of AFB control and the use of such a drug is changed. Prophylactic use is a "dead end" strategy where the drug will invariably become ineffective. Hence, the need for a replacement drug every few years. As we have witnessed in other production systems, it is the "chemical/drug treadmill" phenomenon. The obvious concern is that in modern agriculture as well as in human medicine, the persistent and, in many cases irresponsible use of antibiotics have become so pervasive that the microbial world is increasingly producing resistant strains. Without new antibiotics on the horizon, we are jeopardizing some of our food

production systems if not our own health.

However, the attraction of the prophylactic use of antibiotics in beekeeping is a compelling economic issue because it allows for the reduction of labor costs. When you use antibiotics only when necessary, it means you must monitor continuously through brood frame inspections, culling of frames, etc. This means a great deal of time and effort. Running a few hundred colonies, that may be manageable but when you operate thousands of colonies, it is virtually impossible. Especially here in North America where honey is viewed not much more than a "fancy sweetener", prices have never been sufficiently high to make it easier for beekeepers to adopt more labor-intensive production systems that use little or no drugs.

The difficulty in this debate is to find the happy medium.



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