Red River Apiarists' Association

The Bee Cause

Volume 11, Issue 2 February 2014

- Next general meeting is 7:30 Tuesday, February 41**h** at the **River Heights Community Centre, 1370 Grosvenor Ave., Winnipeg.**
- **(in room right off main-door)**

Speaker: David Ostermann spring management & changes with diagnostics and inspection & field chemicals and Lyme disease information, etc.

Inside this issue:

Substances in honey increase honey bee detox gene expression

National Academy of Sciences University of Illinois at Urbana-Champaign May 1, 2013

(A reason for feeding bees Honey)

A new study shows that some components of the nectar and pollen grains bees collect to manufacture food increase expression of detoxification genes that help keep honey bees healthy. Research in the wake of Colony Collapse Disorder, a mysterious malady afflicting honey bees, suggests that pests, pathogens and pesticides all play a role. New research indicates that the honey bee diet influences the bees' ability to withstand at least some of these assaults. Some components of the nectar and pollen grains bees collect to manufacture food to support the hive increase the expression of detoxification genes that help keep honey bees healthy.

University of Illinois professor of entomology May Berenbaum, who led the study, states that many organisms use a group of enzymes called cytochrome P450 monooxygenases to break down foreign substances such as pesticides and compounds naturally found in plants, known as phytochemicals. However, she relays that honey bees have relatively few genes dedicated to this detoxification process compared to other insect species.

"Bees feed on hundreds of different types of nectar and pollen, and are potentially exposed to thousands of different types of phytochemicals, yet they only have one-third to one-half the inventory of enzymes that break down these toxins compared to other species," Berenbaum said.

Determining which of the 46 P450 genes in the honey bee genome are used to metabolize constituents of their natural diet and which are used to metabolize synthetic pesticides became a "tantalizing scientific question" to her research team, Berenbaum said.

"Every frame of honey (in the honey bee hive) is phytochemically different from the next frame of honey because different nectars went in to make the honey. If you don't know what your next meal is going to be, how does your detoxification system know which enzymes to upregulate?"

Research had previously shown that eating honey turns on detoxification genes that metabolize the chemicals in honey, but the researchers wanted to identify the specific components responsible for this activity. To do this, they fed bees a mixture of sucrose and powdered sugar, called bee candy, and added different chemical components in extracts of honey. They identified p-coumaric acid as the strongest inducer of the detoxification genes.

"We found that the perfect signal, p-coumaric acid, is in everything that bees eat -- it's the monomer that goes into the macromolecule called sporopollenin, which makes up the outer wall of pollen grains. It's a great signal that tells their systems that food is coming in, and with that food, so are potential toxins."

Her team showed that p-coumaric acid turns on not only P450 genes, but representatives of every other type of detoxification gene in the genome. This signal can also turn on honey bee immunity genes that code for antimicrobial proteins.

According to Berenbaum, three other honey constituents were effective inducers of these detoxification enzymes. These components probably originate in the tree resins that bees use to make propolis, the "bee glue" which lines all of the cells and seals cracks within a hive. "Propolis turns on immunity genes -- it's not just an antimicrobial caulk or glue. It may be medicinal, and in fact, (continued on Pg 4)

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Presidents Comments -- February 2014

RRAA, The Red River Apiarists' Association, formed in 1963, represents the beekeepers of the Red River Valley and surrounding area of southern Manitoba. The association provides a forum for the promotion of sound beekeeping practices through education, networking opportunities, meetings, field days, workshops, presentations by local apicultural experts, as well as the dissemination of this monthly newsletter. Privileges come by from time to time to share in this practice of Apiculture with the public and younger generation. Here is an opportunity.

A

Laura Rawluk <lmrawluk@gmail.com> wrote:
Hi Mr. Polcyn,
We still have a workshop spot left for gardening Saturday 2014 and would love for you to come and talk to local gardeners about beekeeping. I know we discussed this in the Summer at the St. Norbert Farmers Market and you were interested then. I would need to hear from you this week with a short bio and a few lines to describe the workshop content. Thank you,

Thank you for your kind invitation to be a speaker at the gardening show in March of 2014. I will be away until late February and would not be available as a speaker at Gardening Saturday as my bees and my business require my attention..
I may be available to speak to one of your Garden Club groups sometime in 2014,
Yours truly,
Charles Polcyn

B

Hello Friends of AITC-M ,
I apologize if you are receiving this email more than once from AITC-M!
I hope you are able to stay warm and cozy on these Manitoba wintry days!
Agriculture in the Classroom is gearing up for the Canadian Agriculture Literacy Week held on March 2-8th, 2014. It is a week that gives YOU an opportunity to share your story and passion for agriculture to Manitoba students across the province. AITC-M is in need of volunteers for any time you are available. It can be an hour in a classroom, a ½ day, full day, or more.
We are in need of volunteers in a couple of capacities:
· Producers and or industry people to share your positive agriculture message to Manitoba students' grade 2-6 (You will read an agriculture themed book and share your agriculture story about your farm, job in the industry with pictures, props, etc.)
· Volunteers to assist the producers and or industry people in classrooms by introducing them, and help manage the timing of the visit and the activity being done with the classroom
Agriculture in the Classroom will provide the activity, book, and training in 2 locations:
· Brandon
· Winnipeg
We have 76 classroom registrations and these are the locations where schools have registered for the program:
Winnipeg (many are here)

Brandon	Swan River	Dauphin	Rossburn
Shoal Lake	Shilo	Poplar River	Austin
Swan Lake	Portage La Prairie	Homewood (Carman area)	
Winkler	Morden	Bruxelles	St. Pierre Jolys
La Salle	Crystal City	Cartier (about 13 km. from outside Wpg. west)	
Steinbach	Prawda (close to Ste. Anne)		East Selkirk
Selkirk	Gimili	Ashern	

If you are interested in being a part of this exciting Canadian Agriculture Literacy Week, please contact me by: February 6, 2014 or pass it on to your friends, colleagues if you think they may be interested! Please see attached form to fill out and send in. You can email form to Diane at diane@aitc.mb.ca or fax to: 204-889-6289. Thank You, Diane

This may be late but if there is another RRAA member who is available for these unique privileges please contact one of these individuals. BEE BLESSED!

Red River Apiarist's Association
January 14, 2014
Minutes-50th Annual Gen Meeting
River Heights Community Centre-Winnipeg

Chair: John Badiuk
Recording Secretary: Art Quanbury

John Badiuk welcomed everyone to the Annual Meeting of RRAA (50th AGM with 28 in attendance).
Approval of Minutes of November 12, 2013
Moved: Chris Argiriou
Seconded: Armand St. Hilaire

Election of Officers

Nominations from the floor were invited for the positions of President, 1st VP, 2nd VP, Secretary, Treasurer, Newsletter Editor, MBA representative. Since no names were forthcoming the incumbents in those positions were returned to office. They are: President, Charles Polcyn, 1st VP, John Badiuk, 2nd VP, Armand St. Hilaire, Secretary, Art Quanbury, Treasurer, John Speers, Newsletter Editor, Ken Rowes, MBA rep., Jim Campbell.
Moved by: Chris Argiriou, Seconded by: Waldemar Damert that the current executive members be elected for another year, Carried

MBA Report by Jim Campbell

Liability Insurance Program

A liability insurance program is available for bee keepers with large or small operations. Information is available in the Newsletter. Members are encouraged to read the details and apply if desired.

Growing Forward Assurance Program

Also in the Newsletter is information on the government's Growing Forward Assurance program. It provides some benefits for beekeepers who wish to replace their brood combs. Individuals must first attend a workshop before being eligible for the program. Bee Biodiversity Workshops are held around the province with one in Winnipeg on Feb. 6, 2014.

Provincial Inspectors

The budget for the inspection program has been cut. RRAA has sent a letter of concern to the Agriculture Minister and to the Premier but have not had a reply yet. The government is proposing a $40,000 grant be made available to MBA to operate an Apiary Inspection and Diagnostic Lab program. MBA executive has not yet decided on whether or not to accept the grant.

Neonicotinoids and Bees

A Saskatchewan researcher preliminary findings indicate neonics are found in ground water run off. More research is needed before the results can be accepted as conclusive evidence. Studies have shown that the neonics remain in the soil and the water for some time.

Treasurer's Report

The Treasurer reported that the Association has a current balance of $2,830.00 with no outstanding expenses. There have been 13 new renewals and members are reminded that 2014 dues of $25.00 are now due.

Social Committee

The Chair put out a request for a member to take responsibility for organizing refreshments at the meetings. Any member who is willing to do this should contact John Badiuk.

Guest Speaker

Waldemar Damert gave a presentation on wintering of bees or more specifically "Why do bees starve?" He provided figures to show that a colony of adult bees requires only 4.8 kg of honey (1.5 frames) to get through the winter. However, there are a number of reasons why a colony might require more food and they are related to the presence of brood in the late fall that requires much more food. The basic solution is to prevent or discourage the queen from laying eggs in late season. This can be done by introducing a queen early in the season. Also the queen will not lay eggs if there is no food in the colony. Waldemar feeds his colonies 24 L of sugar syrup in the fall.
He provided a number of points of information:
If bees stumble out of the hive in the spring they are hungry. You can feed them in the spring with a warm frame of food. Use old bees to make food and save young bees for later activities. Begin feeding at the beginning of September for 2 weeks. Avoid handling the bees in the fall. Keep the entrance open when feeding. Wrap hive mid-November and put in an entrance reducer then. Plug the bottom entrance at the end of March and just leave the top entrance open. Clear snow away in March. Too many supers demoralizes bees so add only two supers at a time.

Door Prize winners

Alex Remkes – lunch bag
Ron Rudiak – honey pot
Albert Anderson –hat and lunch bag
Keith Bamford – lunch bag
Ken Fehler – green hat
Gilles Lantagne – bear
Hans Borst – green vest
James Kozak – lunch bag
Keith Bamford – escape board
Nelson Szwaluk – lunch bag

Adjournment
The meeting adjourned at 9:00 pm. Next meeting is Tuesday February 11, 2014 at River Heights Community Club. Time is 7:30 pm.

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MBA Report February 2014

Jim Campbell, MBA Representative

Manitoba Beekeepers' Association (MBA) sent a letter to Minister Ron Kostychyn, Manitoba Agriculture, Food and Rural Development, requesting a meeting in mid January or February 2014. The purpose of the meeting is to discuss three important issues faced by the beekeeping industry. The meeting will take place in March.

MBA met via conference call on 17 January 2014 and dealt with the offer of a grant of $40,800 to administer and manage the Apiary Inspection Program and the Honey Bee Diagnostic lab, as these are valuable services to the industry. Directors agreed to accept the grant and added some criteria for the acceptance, such as the province maintaining the confidential data, training inspection staff, and continuing enforcement of the Bee Act.

In another area, MBA Executive Committee was re-elected for 2014, and the Committee members will remain unchanged as well. Allan Campbell retained the president position for 2014.

MBA has been invited to appear before the Senate Standing Committee on Agriculture and Forestry. The Committee is seeking input on the importance of bees in pollination to pro-

duce food, especially in the fruit and vegetables, seed for crop production, and honey production in Canada. Among other things, they are concerned about factors affecting honey bee health, plus strategies for government, producers and industry to ensure bee health. The presentation is slated for Tuesday February 11, 2014. The Canadian Honey Council has already made a presentation last December to the same committee.

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(**Detox from Pg 1**) people use it medicinally, too."
Many beekeepers use honey substitutes such as high-fructose corn syrup or sugar water to feed their colonies. Berenbaum believes the new research shows that honey is "a rich source of biologically active materials that truly matter to a bee."
She hopes that future testing and development will yield honey substitutes that contain p-coumaric acid so beekeepers can enhance their bees' ability to withstand pathogens and pesticides.
Although she doesn't recommend that beekeepers "rush out and dump p-coumaric acid into their high fructose corn syrup," she hopes that her team's research can be used as the basis of future work aimed at improving bee health.
"If I were a beekeeper, I would at least try to give them some honey year-round," "because if you look at the evolutionary history of *Apis mellifera*, this species did not evolve with high fructose corn syrup. It is clear that honey bees are highly adapted to consuming honey as part of their diet."

Reference:

W. Mao, M. A. Schuler, M. R. Berenbaum. **Honey constituents up-regulate detoxification and immunity genes in the western honey bee Apis mellifera**. *Proceedings of the National Academy of Sciences*, 2013; DOI: 10.1073/pnas.1303884110

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Pheromone increases foraging honey bees, leads to healthier hives

Oregon State University 16 February 2011

The application of a naturally occurring pheromone to honey bee test colonies increases colony growth resulting in stronger hives overall, according to this study conducted by scientists at Oregon State University (OSU) and Texas A&M University. The study comes amid national concerns over the existence of honey bee Colony Collapse Disorder (CCD) -- a combination of events that result in the death of a bee colony. The causes behind CCD remain unknown, but researchers are focusing on four possible contributing factors: disease, pests, environmental conditions and nutrition.
According to Ramesh Sagili, coauthor on the study, "Division of labour associated with brood rearing in the honey bee: how does it translate to colony fitness?" resiliency to CCD may be increased through -better hive management and the use of optimal dose of brood pheromone -- a chemical released by honey bee larvae that communicates the presence of larvae in the colony to adult bees. Optimal dose of brood pheromone that can stimulate colony growth may vary depending on the colony size, time of application and several other factors.
The number of larvae present in the hive affects the ratio of adult foraging bees to non-foragers in favour of foragers, said Sagili. In our study, when low levels of brood pheromone were introduced to experimental hives foragers collected more pollen.
Nectar is a carbohydrate source for both adults and larvae, while pollen is the primary source of protein. Nurse bees utilize pollen to produce brood food that is provisioned to the growing larvae in the colony. More pollen is equitable to better overall nutrition, one of the areas of concern in the appearance of CCD.
"The low brood pheromone treatment triggered higher pollen collection in the study," said Sagili, who holds an OSU Extension Service appointment and studies honey bee health, nutrition, pheromone biology and pollination in OSU's Department of Horticulture. "Colonies exposed to low levels of synthetic brood pheromone exhibited higher foraging populations, a decrease in the age of first foraging and greater foraging effort. The result is increased colony growth -- an indicator of colony fitness."
The researchers also treated colonies with high levels of brood pheromone. They found the higher treatments were ineffective in increasing the number of foraging bees present in the colony, and in changing the amount of pollen an individual- bee brought back to the hive.
"It's logical to assume that a higher dose of pheromone would result in higher pollen collection within the colonies as it would signify more larvae to rear," said Sagili. "Our results did not support that assumption."
An upper threshold for the pheromone may exist and when that threshold is reached a negative feedback might kick in and colonies may try to balance the ratio of adults to larvae, and that in turn may lead to higher number of adults remaining in the nest for brood care and less bees foraging for resources, said Sagili. -
Brood pheromone is not currently used in commercial bee keeping, however it's application in research may result in the uncovering of mechanisms related to the division of labour, foraging strategies and colony fitness.

Reference:

1. Ramesh R. Sagili, Tanya Pankiw, Bradley N. Metz. **Division of Labour Associated with Brood Rearing in the Honey Bee: How Does It Translate to Colony Fitness?** *PLoS ONE*, 2011; 6 (2): e16785 DOI: 10.1371/journal.pone.0016785

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Stress a key factor in causing bee colonies to fail

Royal Holloway, University of London October 7, 2013

Extended periods of stress can cause bee colony failures, according to new research.

Scientists from Royal Holloway University have found that when bees are exposed to low levels of neonicotinoid pesticides -- which do not directly kill bees -- their behaviour changes and they stop working properly for their colonies.

The results showed that exposure to pesticides at levels bees encounter in the field, has subtle impacts on individual bees, and can eventually make colonies fail.

This discovery provides an important breakthrough in identifying the reasons for the recent global decline of bees, a trend that has baffled many experts worldwide.

"One in three mouthfuls of our food depend on bee pollination," said lead author, Dr John Bryden from the School of Biological Sciences at Royal Holloway. "By understanding the complex way in which colonies fail and die, we've made a crucial step in being able to link bee declines to pesticides and other factors, such as habitat loss and disease which can all contribute to colony failure."

"Exposing bees to pesticides is a bit like adding more and more weight on someone's shoulders. A person can keep walking normally under a bit of weight, but when it gets too much -- they collapse. Similarly, bee colonies can keep growing when bees aren't too stressed, but if stress levels get too high the colony will eventually fail," added Dr Bryden.

"Our research provides important insights to the biology of pollinators," said co-author Professor Vincent Jansen. "It is intriguing that the way in which bees work together is the key to their success, but could also contribute to their decline and colony failure."

The research was funded as part of the £10 million 'Insect Pollinators Initiative,' set-up to understand the causes of pollinator declines and safeguard future pollination services.

Another co-author Dr Nigel Raine. Relays "Pesticides can have a detrimental effect on bees at levels used in the field."

"Our research will provide important evidence for policy-makers. The way we test pesticides, the way we assess their impact on bees, and the way we manage pesticides can all be improved." —//\\—

Ethiopia's landless young find hope and security in beekeeping.

The Guardian January, 2014

In the Tigray region of northern Ethiopia, increasing numbers of young people have no access to the land and its resources. Farming land here is already scarce, and many farms are very small. Many young people risk their lives by migrating to countries in the Middle East to work in domestic servitude, while others are resigned to living in extreme poverty.

Farm Africa kick started a bee colony project in Tigray to help young villagers create businesses and avoid migratory exploitation.

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Pollinators make critical contribution to healthy diets

Pensoft Publishers June 25, 2011

Fruits and vegetables that provide the highest levels of vitamins and minerals to the human diet globally depend heavily on bees and other pollinating animals, according to a new study published in the international online journal *PLoS ONE*.

The new study was carried out by an interdisciplinary research team, composed of pollination ecologists and a nutrition expert, based at the Leuphana University of Lüneburg, the University of Berlin in Germany, and the University of California at Berkeley and San Francisco. The research team showed that globally "animal-pollinated crops contain the majority of the available dietary lipid, vitamin A, C and E, and a large portion of the minerals calcium, fluoride, and iron worldwide. The yield increase attributable to animal-dependent pollination of these crops is significant and could have a potentially drastic effect on human nutrition if jeopardized."

More specifically, the team showed that in the global crop supply, several key vitamins and other nutrients related to lower risk for cancer and heart disease are present predominantly in crops propagated by pollinators. These include the carotenoids, lycopene and ß-cryptoxanthin, which are found in brightly coloured red, orange and yellow fruits and vegetables. Other important antioxidants, including several forms of vitamin E and more than 90% of the available vitamin C, are provided by crops that are pollinated by bees and other animals.

Key minerals for the development of bones and teeth, including more than 50% of calcium and fluoride available in the global food supply, are present in crops produced with pollinators. Plant sources of calcium, such as sesame seed, almond or spinach, are particularly important in regions of the world where dairy production is often not culturally, environmentally or financially feasible.

The animal-pollinated crops included in this study vary in the extent of their dependence on animal pollinators, with many able to propagate via alternative mechanisms, such as wind or self pollination. Despite this, the researchers estimate that up to 40% of some essential nutrients provided by fruits and vegetables could be lost without pollinators.

Bees and other animal pollinators are experiencing declines in many parts of the globe. Many farmers around the world depend on the European honey bee, importing them seasonally to pollinate their fields. However, the European honey bee has suffered massive overwintering losses, proposed causes of which include disease, pesticides and lack of nutritional (floral) resources. Wild pollinators that provide pollination services "for free" are also declining rapidly as habitat is destroyed by intensive farming practices such as agrochemical-based monoculture. The results of this study demonstrate the potential impact of this pollinator decline on human health. **Reference**:

1. Elisabeth J. Eilers, Claire Kremen, Sarah Smith Greenleaf, Andrea K. Garber, Alexandra-Maria Klein. **Contribution of Pollinator-Mediated Crops to Nutrients in the Human Food Supply**. *PLoS ONE*, 2011; 6 (6): e21363 DOI: 10.1371/journal.pone.0021363 —//\\—

Red River Apiarists' Association

Editor's Note by Ken Rowes

Depressed and shut in with this cold weather sends you worrying about the bees. I am sure with the snow cover they are all doing fine.

Spent some time checking temperatures with a few other RRAA members through top entrances before complete snow cover. The temperature is not accurate but can say if there is a heat generation and the degree may give a indication of hive strength without going directly inside. Temperatures ranged from +5 to + 20 C.

Note:

In what has been termed a "classic experiment", J. E. Eckert essentially repeated the "wreath experiment" from a three year study (1927-1929) that was published in 1933. Lately Eckert picked two irrigated areas in Wyoming that were separated by a 17 mile stretch of barren badlands, then placed colonies at increasing distances from the irrigated areas. What's striking about this experiment is that colonies can make a living when the nearest food source is four miles away. From this, it is easy to see that a two mile buffer zone is not sufficient to protect bees from pesticides (or to prevent pollen transfer from two different varieties of plants grown several miles apart). In this study bees travelled 7 miles to a nectar source to survive. So how much can you believe in organic honey!

This year 2014 is a GREEN year for marking queens.

The Bee Cause is the official publication of the Red River Apiarists' Association for distribution to its members and their colleagues in the beekeeping industry. It is published eight times a year on a monthly basis except December and the summer months of June, July, and August when membership meetings do not occur.

Articles can be best submitted in word documents as email attachments. Though they may be edited for spelling and basic grammar, no changes will be made to their contents, message and opinions. They are those of their originator and not of the Red River Apiarist Association.

Deadline for any submission to this newsletter is the second Saturday preceding the membership meeting to allow for publishing and mailing delays. Regular membership meetings are normally scheduled 7:30 PM on the second Tuesday of every month at the River Heights Community Centre located at 1370 Grosvenor Avenue in Winnipeg except the months as noted above.

The Red River Apiarists' Association, formed in 1963, represents the beekeepers of the Red River Valley and environs in southern Manitoba. The association provides a forum for the promotion of sound beekeeping practices through education, networking opportunities, meetings, field days, workshops, presentations by local apicultural experts, as well as the dissemination of this monthly newsletter.

We are on the web!
www.beekeepingmanitoba.com

CLASSIFIEDS

1 For Sale: Plastic queen excluders $3.50 each. SS Tank holds 8 drums of honey, $1800 OBO. Contact, Lance W. **Phone 204-712-6783, Email; lancewld@gmail.com**

3 For Sale: For sale : heavy frames of pollen - $60 per super of ten frames, 15 supers of plastic frames - $34 ea. Wrecking 2005 F-350 4x4 – asking $4,000 OBO Booking spring colonies – minimum 4 frames of brood – mid May - $250 30 honey supers with plastic comb - $32 each Winter wraps made to your specifications - $45 to $65 each Interlake Honey Producers Ltd. Interlake Honey Producers, Fisher Branch, MB 204-372-6920 . Can deliver to Winnipeg. Supers are in good to average shape and all the frames are fully drawn out plastic frames. We have no AFB history. **Paul Gregory paul@interlakeforageseeds.com**

5 Wanted: Looking for good used Cowen type horizontal 28 to 60 frame extractor, plus sump and pump. Call **Don Friesen, Rosenfeld, at 204-746-8863 or e-mail stonefield71@hotmail.com**

9 For Sale: Man Lake SS Extractor 9/18 frame. Asking $1300, used twice. **Contact Janice at 204-895-9667.**

10 For Sale: Bee Equipment, Nucs, Plastic Feeder Frames, Box & Frame Parts. Contact **Charles Polcyn at (204) 284-7064 or by Email- charles_polcyn@ymail.com**

11 For Sale: 6 hive top feeders, 20 frames with foundation call 204-612-2754 Doug Beck or e-mail doug-janetb@hotmail.com

12 For Sale: 2 frame manual extractor, uncapping knife, bee suit, smoker bellows, hive cover (metal), 5 supers (assembled), 50 frames (plastic & wire), 2 hive bottoms, hive scrapers, and much more for $ 450.00 Please call Adrian at 204-338-7172

Please review ads and renew for the next meeting.
(just email editor to keep the ad going or to update it)

Thanks the Editor

Some Thoughts On Bee Breeding In The North
Written by Kirk Webster

I have a favorite book from the 1940's: The Farming Ladder, by George Henderson. It's a great story of two brothers from London, who set out at age 15 and 16—with no money—to learn farming and eventually have their own mixed livestock farm. Their rapid and substantial success was largely based on the excellent education they received by working on several really good farms, and then combining the best of what they had learned. By the time they were established and had pupils of their own, this was some of the advice they invariably handed out: "When you need to learn how to make hay in a wet climate, always go and learn in a place with more rain than you have at home." And with livestock: "Always get your breeding stock from a place with a harsher climate than you will have on your farm." In North American beekeeping we have largely been ignoring this sound advice and doing just the opposite for almost 100 years.
It was amazing how well southern bees often did in the northern states, even during the winter—until tracheal mites arrived. Now, with the added pressure from varroa and other pathogens—and Africanized bees encroaching on more of the southern bee producing territory—we really need to use the North's great potential for selecting and breeding bees.

When you bring animals, selected and bred in a harsh environment, to a more benign place, they sometimes exhibit a kind of "release" phenomenon, resembling hybrid vigour, which allows them to thrive better than the local stock in their new environment. Honeybees are no exception.

When I first worked for Charlie Mraz here in 1972, I spent many a Sunday with him catching the queens which were enabling beekeepers in Mexico to restore vitality and productivity to their industry. And the queens and nucs I've produced here have had their greatest success in southern New England and the Mid-Atlantic states. It doesn't always make for a better bee for making a living just by moving them south. In parts of Louisiana for example, where the main honey flow comes very early, they really need a bee that holds a big cluster over the "winter", and broods up early in response to temperature rather than day length or pollen flows. In my environment, natural selection favours bees with great winter longevity and delayed spring build-up, rather than large cluster size and early build-up. So, mine may not be the best bees for the Gulf Coast; at least if you're trying to produce honey with them. Where selection and breeding are continuous, year in and year out, each environment emphasizes certain characteristics. In the past, beekeepers of long experience knew that bees from a certain area did better than any others, in their particular management scheme. The skill and attentiveness of the beekeeper is a huge factor in all this, but once we have some really skilful beekeepers selecting, breeding and producing queens in the North, these queens are likely to be very useful all around the country. A couple of things are certain: we have a corner on winter hardiness, and the best chance of maintaining all-European stock in the future. One of the reasons why it can be very easy to produce good queens in the North during summer is because the good beekeeping territory is full of honey producing colonies and drones are superabundant. If honey production and queen rearing are carried out in conjunction with each other, this will always be the case. I have no doubt that many of the problems beekeepers have been having with their purchased queens over the last decade come from overtaxing the supply of drones. The drone population is being maxed out by both the overproduction of queens, and the effects of mite control chemicals. Where a relatively small number of queens are being produced in a good honey producing area, the drones represent a huge, untapped resource. But at the same time, these drones can be a serious problem. One of the most important reasons for raising queens now is to propagate varroa resistant stock. For this to occur, and for the resistance to improve, survivors must mate with other survivors. This can be impossible in crowded commercial beekeeping areas, with many beekeepers, and each one pursuing a different objective.

There are only three practical ways to achieve mating control with honeybees—Instrumental Insemination (I.I.); Natural Mating in Isolation; and Drone Saturation. I.I. creates absolute control over the breeding process; but it may not be practical when used alone, and is probably most valuable when used in conjunction with the other two methods. I've always been most interested in natural mating in isolation. (This is my only good option here, where the honey producing territory is crowded with bees, with many owners and all jumbled together.) At a good site, there's very good control of the mating, the work is very exciting, and many controlled crosses can be made in a short time. The problem is finding a workable site. In addition to being truly isolated, a practical site must also be within a reasonable driving distance, and capable of sustaining mating nucs and drone rearing colonies for at least three rounds of queen mating. Such sites are, unfortunately, very rare.

Drone saturation is the most likely method of mating control available to commercial beekeepers. It doesn't create the degree of control possible with the first two methods, but aside from that it has many advantages. The work is all done right in your own home territory, without the need to maintain new or distant locations. If you can surround your mating yard with your own honey and drone producing yards, then you should be able to make progress breeding your own bees. If you have a large area with only your own queens and drones in it, then you have something really solid and exciting to work on. With the depleted number of colonies and beekeepers, and the large size of many surviving apiaries, there should be several places like this in the northern states now. And when fuel prices start rising out of control, perhaps the old model will return; with smaller apiaries and yards clustered tightly around a home base—with a mating yard in the middle.

For most beekeepers, breeding against varroa means bringing some new stock into the apiary—often with behaviours we are not accustomed to. This was certainly the case with the Russian bees. Like many other beekeepers, at first I found them very frustrating to work with. They had such small clusters in the fall and spring; were slow to build up early in the season; and packed too much honey in the brood nest. They also didn't draw foundation very well, compared to my old bees; were susceptible to chalkbrood; and could throw off a swarm at the most ridiculous times. But from the beginning it was clear they had real resistance to varroa, and many other valuable traits, so I stuck with them. After five years I am finally getting the hang of it. Once I stopped trying to make them fit in with my idea of how a honeybee colony should behave, and let them be themselves, everything started falling into place. Last fall, at the Pennsylvania State Beekeepers meeting someone asked if I would stick with Russian bees if a safe, cheap and effective varroa control came on the scene. The answer is an unqualified yes. I now think these bees will eventually be even more productive and profitable than my old bees were in the days before varroa troubles. Their small clusters, frugality, and great winter hardiness make them already well adapted to overwintering in nucleus colonies. They are very gentle, and have an amazing capacity to gather nectar. But for this nectar gathering to result in a honey crop, they must be managed differently than Italian-type bees.

Many of the queens being sold now as "Russians" are heavily hybridized, and so their behavior can vary all over the map. But here are a few suggestions to start off with if you want to work primarily with Russian bees. This is based on my experience here in Vermont, where we have a very strong dandelion flow from about May 10—25 followed by a dearth of sorts until clover starts yielding around June 20. (Honeysuckle is starting to fill this gap in some spots.) Clover and alfalfa can yield surplus anytime (or not at all) between June 20 and September 10; after that, any fall honey stays in the brood nest.

First of all, these bees consume very little honey over the winter, and two deep boxes is way more room than they need for the winter cluster and stores. One and a half boxes is probably the ideal size—even this far north. April is the only month when they seem to lose any appreciable weight. They are very slow to get started on the main build-up—but once they do, watch out! If they become anywhere close to being crowded during the dandelion flow, they are almost certain to plug up the brood nest, build cells, and throw off a swarm. In addition to being slow starters, I'm now convinced they should be held back even further, by taking some brood and bees out in early May. I try to have the queens just starting to lay in a second hive body during the last few days of the dandelion flow. This is literally half the size I used to consider optimum at this time of year, with my old bees. If possible, Russian bees should have only drawn combs for the spring build-up. If you must draw foundation at this time, it's best to draw just one or two frames at a time, right in the brood nest during a honey flow. Much better is to draw the foundations up in the supers after July 4 or, best of all, in the summer nucs. After the spring build-up, it's largely a matter of giving them more room before they need it. The individual bees live a very long time, and a large colony can gather an amazing amount of honey in a short time—so keep an eye on them! I use excluders and shallow supers, but it might work better to have all deep combs and a free ranging brood nest. You can strip the honey way down in the late summer, and I've never yet had to feed any bees that were at least 75% Russian.

If you still long for a bee that's more like an Italian, don't worry! If you keep selecting them yourself, they will eventually move in that direction. If you only breed from colonies without chalkbrood, then chalkbrood gradually diminishes. By the same process, we could eventually have Russian bees with less swarming, larger clusters, and better at drawing foundation. But only if many of us keep making our own selections year after year. I'd like to make some more progress on these fronts myself, but I have to admit that after selecting my own breeders for a few years, and letting the bees tell me what they need, I've been won over. They have everything I most want and need in a strain of bee—gentleness, high productivity, hardiness, and requiring very little attention. Now, a few nuts and bolts things about breeding and record keeping: I've looked at Brother Adam's pedigrees and methods of record keeping. They are extremely interesting, and anyone seriously interested in bee breeding should study them closely. But this type of record keeping is very time consuming, and there is a whole long list of unforeseen circumstances that can come along and make reams of such records completely worthless. In my own apiary I do only just enough record keeping to help identify the best queens in each generation, know their age and families for certain, and prevent inbreeding depression. I'm afraid my entire arsenal of high-tech tools for record keeping consists of a lumber crayon, thumb tacks, a pair of queen-clipping scissors, and a few pages in my notebook. When selecting your own breeders, and closely controlling the mating of virgins and drones; you very soon have to consider the possibility of inbreeding depression—especially when you're working with a small number of varroa survivors. A certain amount of inbreeding is almost certainly necessary to fix and develop the varroa resisting qualities—whatever they happen to be. But Nature's design for honeybee mating is to maximize out-crossing by every possible means. Too much inbreeding results in a loss of vigour; and for practical beekeeping, once you've lost vigour, you've lost everything. So how can we walk this fine line between fixing new characteristics in a strain, and at the same time prevent loss of vigour? Here's my attempt at a workable solution: My bees now represent 15 different families. Each family originated from one outstanding survivor queen. At the beginning (1999—2003) these queens were almost completely unrelated to each other. The majority of these families came from the various lines of Russian bees released by the USDA; but there were 3 other, completely unrelated sources as well—SMR stock, survivors from my original bees, and survivors sent to me

by other beekeepers. Because it takes 2 years in my system for a queen to qualify as a breeder, I only need to graft from half of my families each year, (though in practice I usually graft from most of the families each summer). In the isolated mating area the majority of drones represent just 4 of the 7—12 queens that were used as grafting mothers the year before. I use 24 drone rearing colonies for 200—225 mating nucs. These drone rearing colonies are over wintered nucs, and with summertime matings they have plenty of time to build up in the valley before being taken up into the isolation area. Drone combs can be easily added at the optimum time for the 3 mating cycles. I like to use old combs for this, only partly covered by drone cells; and I add only the equivalent of ½ frame of drone comb each time. In anything less than ideal conditions, I think those full frames of drone comb are too much to give the colonies all at once, especially if you want those colonies to produce drones for 2 or 3 rounds of mating.

Because my original families were unrelated, my new queens were quite hybridized for the first couple of years. Now they are calming down and the families are more like one another. Over the years a couple of families have dropped out (though they are still theoretically present because they were used as drone mothers at some point), and stronger families have been split in two. Through ruthless selection by mites and weather, the Russian characteristics are now dominating in all the families. It may not be scientifically accurate, but I now think of my gene pool as a tub full of water, with a few slow leaks in the bottom. To compensate for the leaks, I try to start a new family every year or so, from a promising, unrelated queen brought in from outside. This way new blood is constantly trickling in, but very slowly. The great majority of my bees come from stocks selected and propagated here for several years, but there are at the same time a few new families coming along that can be amplified quickly if any of the old families start to show inbreeding depression.

Reliably keeping track of all these families would seem like an onerous task in a busy commercial beekeeping summer, but I think I've reduced it to the simplest possible procedure. This is where my high-tech record keeping equipment comes in. First, all nucs are numbered with a lumber crayon, when the loads are first set out. Inside the queen cell carrying box is a sheet of paper recording the pedigree of each row of cells, and also which nucs they went into.

When queens are caught in the isolation apiary, their wings are clipped, and they are transported in a special carrying box where the families can be kept separate. When introduced into nucs, the numbers are recorded in my notebook. After extracting is finished in early October, I spend a day marking all the various nuc boxes with coloured tacks; using the information from my notebook and the card from the queen cell box. The colour and position of the tack shows the mother of the queens) inside, where she was mated, and the date the nuc was made up. After this, the lumber crayon numbers are all forgotten, and the nucs can be moved if necessary into other locations for winter. The following spring, in the honey producing yards, any nucs used to replace winter losses carry their tacks with them; and on the surviving colonies tacks are added or removed if requeening is done. The tacks always show the last time a queen was actively changed (by me) in any colony. The only other information recorded in the honey producing yards (by lumber crayon) is the number of honey supers removed. In early spring, a list can be drawn up of potential breeder queens in each yard. Later, a search is mounted for the right number of breeders from the right families; and this can be done in conjunction with reversing, equalizing, and requeening. The clipped wings ensure that no swarm or supercedure queen is selected by mistake. If no queens from a key family can be found here, I go back to the nucs, and use one that has only been partially tested. In theory I only need 8 queens to graft from each year, but I always try to bring at least 12 back to the cell-building yard.

I always have a big smile when I read letters from my Scandinavian friends describing how they breed their bees. After a carefully drawn schematic showing a certain queen's pedigree, they always have in parenthesis: (theoretical). My program is theoretical too. Anyone who takes care of a large number of honeybee colonies knows perfectly well that plans are really just ideas that circumstances love to wreak havoc upon. I have drones of unknown origin in some of my mating nucs; or maybe this year I will find another hobby beekeeper in my mating area, who buys packages from the South every year—because they never survive the winter. How many nice days will there be during May? Some years we've had 25 in others only 3. Clipped queens sometimes crawl into other hives when they try to fly out with a swarm. And skunks can be worse than computer hackers when they come at night and scratch the tacks off my nuc boxes.

The key is to find a system that is flexible and resilient—able to keep functioning through all sorts of large and small disasters. I'm just trying to gently lean on the bees and get them to move in a certain direction, without compromising their health or natural instincts. It seems to be working.

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<u>Vermont beekeepers face a new threat "Zombie bees</u>".
The Atlantic Journal Constitution January 31, 2014

Beekeeper Anthony Cantrell of Burlington discovered the "Zombees" in his hive in October, the first time ever found in the eastern United States. John Hafernik, a professor from San Francisco State University, discovered the first zombie bees in 2008. A fly called Apocephalus borealis attaches to the bee and injects its eggs, which grow inside the bee. It is believed it causes neurological damage resulting in erratic, jerky movements and night activity, like a "zombie". They fly around in a disoriented way, get attracted to light, and then fall down wandering around reminiscent of zombies. They've taken to calling it, when they leave the hive, "the flight of the living dead." They often die an hour after showing symptoms. Hafernik and others have been tracking them across California, Washington, Oregon and South Dakota. —/\\—

Reminder for Manitoba's Beekeeping Community

108th Annual Convention of MBA
Friday Feb 28-Sat Mar 1, 2014

Canad Inns Destination Polo Park
1405 St Matthews Ave, Winnipeg
Visit the web: www.manitobabee.org and go to "Convention - Symposium" page for links to download Registration Form, and Agenda.
Keynote Speakers: Randy Oliver, Grass Valley, California and Dr Jamie Ellis, Entomology Dept, University of Florida.

Presentations (see agenda for topic times):
- Research that I've been doing on Bee Nutrition - What I've learned about the supplemental feeding of Bees.
- The Impacts of pesticides on Honey Bees.
- Understanding the keeping of Bees - A deep look into the biology of the bee colony, nutrition, parasites and disease over the course of a year.
- Queen Health in Alberta - Evaluation of imported and local honeybee stock.

Saturday session highlights
9:30 a.m. Practical Applications--What The Beekeeper Can Do To Help His/Her Bees, What Works For Us - Randy Oliver, ScientificBeekeeping.com, Grass Valley, Calif

10:30 a.m. The Impacts Of Pesticides On Honey Bees - Dr. Jamie Ellis, Assoc Entomology Professor, Univ of Florida;

11:00 a.m. Research That I've Been Doing On Bee Nutrition--What I've Learned About The Supplemental Feeding Of Bees - Randy Oliver, ScientificBeekeeping.com, Grass Valley, Calif

1:00 p.m. U of M Honey Bee Research Update – Dr. Rob Currie, Derek Micholson, Rasoul Bahreini, Suresh Desai, Univ of Manitoba

3:30 p.m. Honey Bees As Superorganisms - Dr. Jamie Ellis, Assoc Entomology Professor, Univ of Florida;

Early Bird Registration (Feb 14): non member $205 for conference, or $115 single day at the door.

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Red River Apiarists' Association
Winnipeg, Manitoba
2014 MEMBERSHIP APPLICATION

I apply for membership in the Red River Apiarists' Association. Membership includes one-year subscription to the newsletter "The Bee Cause" (8 issues)

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