Red River Apiarists' Association

The Bee Cause

Volume 13, Issue 8 November 2016

Next general meeting is 7:30 Tuesday, 8 November 2016 at the **The Elmwood Legion 920 Nairn avenue , Winnipeg.**

Speaker:
Fall social;
Gadget night

New elections committee

Inside this issue:

News from the world of bees

Fran Bach, Western Apicultural Society Journal and Washington State Beekeepers newsletter editor 509-573-4245 febach3@gmail.com

- Bayer and Monsanto and CRISPR.

Do Bees Have Any Role In Their Future?

CRISPR (Clustered regularly-interspaced short palindromic repeats) Cas-9 is the most high profile gene-editing tool today and a technique that's far more palatable to those adverse to genetic modification, because it mirrors a natural-occurring procedure. CRISPR basically uses a similar mechanism that living organisms use when repairing damaged DNA, snipping out unwanted fragments, and replacing or reorganizing what is left behind. Because this method does not introduce any foreign DNA, as some GMO technology does, it is arguably an advanced breeding method that could occur in nature over several years of evolution. Therefore, it's not subjected to the same levels of regulatory scrutiny that traditional GMO technology has been in the past.

The buzz about neonicotinoids still does not confirm whether huge pesticide losses for honey bees are occurring. **But the word is getting out that these pesticides should not necessarily be available to the general public. Thus, large chains are dropping them from their inventories, which can only be beneficial to honey bees and other** potential pollinators.

Nutrition is one of the several possibilities researchers think is the cause of honey bee losses. A North Carolina study concludes: "In the first large-scale and comprehensive study on the impacts of transporting honey bees to pollinate various crops, research from North Carolina State University shows that travel can adversely affect bee health and lifespan. Some of these negative impacts may be reduced by moving bee colonies into patches with readily available food or by providing supplemental nutrition when there are few flowers for honey bees to visit." **This reminds me of studies in Australia by nutritional apicultural researcher Graham Kleinscmidt and others who pioneered moving bees from eucalyptus to better pasture during honey flows as those trees provided little pollen. The bees were monitored for their protein levels and via measuring nitrogen levels, and were relocated accordingly. Other research in both Australia and Brazil confirms the importance of nutrition and its monitoring via the** haemolymph analysis. **The Bee Health Extension site also provides in-depth information on nutrition by** Zachary Wang.

Thanks to reader Al Summers for sending me an interesting post on something called "predatory" publishers. This is really an eye-opener for anyone attempting to figure out the facts when it comes to journals and publica-

(Continued on page 4)

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Presidents Comments for May, 2016

Greetings to all the Beekeepers.

November is hear and my bees all wrapped, fed, and treated for mites - I hope yours are too.

Looking back at the summer and the weather patterns, it is a surprise to see the bees bringing in a decent crop of honey. It is a mixed bag across the province and even into Saskatchewan, ranging from 65 lb to 175 lb and averaging around 110 lb.

The honey price is slowly coming up on the bulk sale. It is around $1.25 per lb and it is moving into the right direction.

I have returned the Styrofoam beehives to the fellow beekeeper that had lent them to me for the experiment. My experiment is based on one year time line, I wintered 4 hives without losses. One hive was close to starving in the spring. Overall population in the hives coming out last spring was good. The hive entrances were modified to have a top and bottom entrance. I also removed the screen in the bottom board and inserted a fitted piece of Styrofoam. Spring development was lagging, the brood expansion was slower by an average of 2 frames behind the bees in wooden hives. I believe the disconnection to the outside temperature was the cause. None of the hives swarmed, that was a good thing, on the other side the honey production was supper behind, so less bees less honey.

My one year experience with Styrofoam hives is not the greatest. It definitely needs atop entrance for venting out the moisture, however every equipment has its plusses and minuses. It is a lot lighter and very easy to assemble, it is not the silver bullet for our climate. I will not recommend the hives to new beekeepers.

Our November meeting is on the 8th and it is gadget night, so bring your inventions, jigs and anything that is making your beekeeping interesting and share it with the fellow beekeepers.

Looking forward to see you all!
Waldemar Damert

Styrofoam Bottom board

entrance is at bottom

Inside – screen goes under the foam side clips removed for winter plug

underneath open space plugged as well as clip spaces

Red River Apiarist's Association
Minutes of the Regular Meeting
October 12, 2016

Chairman: Waldemar Damert
Recording Secretary: Art Quanbury

Approval of the Minutes of the previous general meeting
Motion: That the minutes of the general meeting held on September 13, 2016 be accepted
Moved: Alex Remkes
Seconded: Giles Lantagne
Carried

President's comments
Waldemar commented on the need to have more members involved in the activities of the Association. To that end he said that a number of committees would exist to more clearly define the areas where volunteers are needed.

Education and Promotion: The Association holds two shows every year at the Forks to educate and inform the public about beekeeping. Some members go to schools to give talks about beekeeping to classes. Marg. will circulate a list of school events and volunteers needed. Membership education on beekeeping is provided at every meeting on timely topics related to the time of year. Information is also provided about beekeeping issues world-wide. Two queen rearing workshops were given this year to interested members who want to raise their own queens.

Social committee: A small group of members is needed to plan and carry out the various social activities of the Association; organizing coffee and snacks at all regular meetings and setting up chairs (need to arrive ¾ hour before meeting begins) and putting chairs back at end of meeting, organizing social aspect of November meeting where more snacks like cheese and cold meat trays are provided.

Honey Shows: Armand informed the members of the considerable effort and information needed to put on the two honey shows at the Forks including communicating with the Forks, picking up equipment, arranging liability insurance, etc. In order to make it easier for people to be involved he will be preparing a list of jobs needed to be done and a timeline of them. He also commented on the contributions made at meetings by the 'elders' in our group who willingly share their knowledge.

Newsletter: Ken outlined the many activities to publish the Newsletter every month. His particular passion is in finding research articles on bees and beekeeping and presenting them in a way that they can be easily understood but producing the newsletter requires many other activities such a layout of material, obtaining contributions from other executive, photocopying and mailing, sending electronic copy to Duane for electronic distribution, etc. Help is needed with all these activities so he can concentrate on producing a Newsletter that is more than just a local in-club Newsletter.

Use of Social Media and Web Site: Duane commented that the web site is out of date and needs work to update it by someone with the necessary skills. The club needs to explore the use of other social media such as Facebook and Twitter. A small group of people knowledgeable with these media is needed to strategize on the best way to use them for the benefit of the club and beekeepers.

Future of RRAA Involvement: John Russell commented on the future role RRAA could play now that urban beekeeping in Winnipeg is a reality. There will be more individuals wanting to keep bees and they will need to be helped and informed. The general public will also need to be educated about the benefits of urban beekeeping and the minimum risk associated with it. This will require more interaction and involvement from the membership at large. Right now, most of the work is done by the executive members.

Guest speaker: Chris Kirouac from the Bee Project provided a history of the Bee Project and its involvement in facilitating urban beekeeping in Winnipeg. The Bee Project has many objectives; providing public engagement with beekeeping to help connect urban people with their food sources, teaching the public about the non-aggressive nature of honeybees, providing a DIY project for families and neighbourhood groups to bee involved in beekeeping. There are advantages to beekeeping in the city; the climate is warmer than in the country, there is a variety of food all season long, there is wind protection, urban plants and trees can be better pollinated. Currently beekeeping is only allowed in the downtown core, 4 hives maximum, a permit is required ($100). Rules are open to being broadened. Chris felt there was an important role for RRAA in providing information to new beekeepers and to the public at large. Membership in RRAA could be made a requirement for keeping bees in the city as could the need to take a beekeeping course. The U of M course has limited space and if many more people want to take a course RRAA could possibly give one. The extent of urban beekeeping this year was fairly small; 5 -7 sites with 4 hives per site.

Loonie Draw
Several members brought squash and zucchini as prizes. Several members who had their names drawn declined a prize but winners included:
Alex Remkes – jar of jam
Hans Borst – zucchini
Monica Wiebe – squash, candles
Joelle Boucher – beeswax candle
Dave Weslak – stamps
Nelson Szwaluk – wall ornaments
Mary Louise Chown – zucchini

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MBA Report April 2016
Margaret Smith, RRAA MBA Representative

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Do you know your Bee?

The Honey Bee exhibits regional heterothermy wherein their body temperature can vary with the environment

Insects which possess this mechanism, the best-known example being bumblebees, exhibit counter-current heat exchange at the point of constriction between the mesosoma ("thorax") and metasoma ("abdomen"); heat is retained in the thorax and lost from the abdomen. Using a very similar mechanism, the internal temperature of a honeybee's thorax can exceed 45°C while in flight.

Heterothermy (from Greek: *heteros* = "other" *thermē* = "heat.") is a physiological term for animals that exhibit characteristics of both poikilothermy and homeothermy.

Ectothermic: Relating to an organism that regulates its body temperature largely by exchanging heat with its surroundings; cold-blooded

Poikilothermic: An organism, such as a fish or reptile, having a body temperature that varies with the temperature of its surroundings.

Homeothermy: An organism, such as a mammal or bird, having a body temperature that is constant and largely independent of the temperature of its surroundings.

Source: The Free Dictionary —//\\—

What are enzymes?

Some scientists call them "life force". Enzymes are complex protein molecules found in every cell of your body. Molecules that accelerate, or catalyze, chemical reactions in our body. All living organisms (honey bees or humans) produce their own enzymes to provide the nutrients they need. Everything else, all our food, plant or animal, contain enzymes.

Digestive enzymes work inside the digestive tract to break down our foods so it becomes small enough to be absorbed. First in our month the amylases enzyme breaks down carbohydrates (like rice or pasta) into smaller sugars. Then in our stomach, the digestive enzymes help transform food into tiny nutrients that the body can absorb and use to renew aging cells and to provide energy.

The enzymes in our body decrease with our age. The fact that we eat over-processed food, which implies heating it over 60° C, doesn't help either. This lack of enzymes may lead to frequent fatigue, dizziness, lack of mental focus, muscle pain, indigestion, lack of appetite, and low blood sugar. A supplementation is needed. Fresh and raw fruits and vegetables are a great source of enzymes. Raw honey also contributes to the amout of enzymes in our body, though these are found in small quantities in honey. Yet, they synergistically work with other substances and support our health and tonic.

Japanese are considered to be one of the healthiest nations in the world. It could be due to their culinary habits of eating relatively large quantities of raw, enzyme-rich fish and seafood and cook their vegetables at a minimum.

Healthywithhoney.com

tions. Jeffrey Be all **has published this list from 2011 (81 suspect publish to 2016 (923 suspect publishers). Now he is adding a list of "misleading metrics," and "hijacked" journals, which also is growing: 2015 (30) and 2016 (101). "These include companies that 'calculate' and publish counterfeit impact factors (or some similar measure) to publishers, metrics the publishers then use in their websites and spam email to trick scholars into thinking their journals have legitimate impact factors. The hijacked journals list includes those for which someone has created a counterfeit website, stealing the journal's identity and soliciting articles submissions using the author-pays model (**gold open-access)." **This is another version of "**caveat emptor."

There are those stories I wished I would have written. This is one; a lengthy discussion of a guy who was a hero and became a villain. It reminds me of the two faced gargoyle that is found on theatre logos (sad and happy) or the God Janus. **The subject is Jerry Hayes, ex-Florida chief apiarist, who resigned to become the "honey bee lead" for Monsanto Corporation. He became "a man who loved insects in a place where insects are the enemy," hitching his** star to RNAi, **which might signal the end to** Varroa depredations in a beehive, **but so far has fallen short. Unfortunately, at the same time many concluded that he'd gone over to the "dark side," to affiliate with the enemy. Like so many things, there's a complexity that must be analyzed before hard conclusions can be made. The author summarizes: "When honey bees encounter too large a gap within a hive, they use beeswax to bridge it. Hayes once believed...that he could build a similar bridge. 'I was naive,' he says. He knows he wasn't wrong about the mites. It was humans that** he didn't understand."

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Pesticides diminish bee sperm – study

Published July 27, 2016

PARIS - Neonicotinoid pesticides, already blamed for short-circuiting honeybee brains, also diminish their sperm, possibly contributing to the pollinators' worrying global decline, researchers said Wednesday.

Widespread neonicotinoid use may have "inadvertent contraceptive effects" on the insects which provide fertilisation worth billions of dollars every year, said a study in the British journal Proceedings of the Royal Society B.

In their experiment, researchers divided bees into two groups.

One group was fed pollen containing field-realistic concentrations of two neonicotinoids -- thiamethoxam and clothianidin.

The other group was given untainted food.

After 38 days, the male drones—whose key role in life is to mate with the egg-laying queen—had their semen extracted and tested.

The data "clearly showed... reduced sperm viability"—which is the percentage of living versus dead sperm in a sample, said the study.

Honeybee queens mate for just a single short period, but with many males in a sort of bee orgy, before storing the sperm for the rest of their fertile lifetime.

Bees have been hit in Europe, North America and elsewhere by a mysterious phenomenon called "colony collapse disorder," which has alternatively been blamed on mites, a virus or fungus, pesticides, or a combination.

The new study adds reduced sperm quality to the list of possible causes.

"As the primary egg layer and an important source of colony cohesion, the queen is intimately connected to colony performance," the paper said.

Previous studies have found neonicotinoids can cause bees to become disorientated to the extent that they cannot find their way back to the hive, and can lower their resistance to disease.

The European Union has placed a moratorium on the sale of neonicotinoids.

Last year, a study found that wild bees provided crop pollination services worth more than $3,250 (€2,950) per hectare every year.

Bees account for an estimated 80 percent of plant pollination by insects. — Agence France-Presse

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Neonic pesticide link to long-term wild bee decline

By Matt McGrath Environment correspondent 16 August 2016 From the section Science & Environment

The large-scale, long-term decline in wild bees across England has been linked to the use of neonicotinoid insecticides by a new study.

Over 18 years, researchers analysed bees who forage heavily on oilseed rape, a crop widely treated with "neonics".

The scientists attribute half of the total decline in wild bees to the use of these chemicals.

Industry sources say the study shows an association, not a cause and effect.

Weighing the evidence

In recent years, several studies, conducted in the lab and in the field, have identified a negative effect on honey bees and bumble bees from the use of neonics. But few researchers have looked at the long term impacts of these substances.

This new paper examined the impacts on populations of 62 species of wild bees across England over the period from 1994-2011. The team, from the Centre for Ecology and Hydrology (CEH), used distribution data on wild bees, excluding honey and bumblebees collected by the bees, ants and wasps recording scheme. They were able to compare the locations of these bees and their changing populations with growing patterns of oilseed rape across England over 18 years.

The amount of this crop being sown has increased significantly over the period of the study, from around 500,000 hectares in 1994 to over 700,000 in 2011.

The lime-loving furrow bee has shown a 20% decline in wild populations

A key innovation was the commercial licensing of neonicotinoid insecticides for the crop in the UK in 2002. Seeds are coated with the chemical and every part of the plant becomes toxic to pests.

Manufacturers hailed the development as a major advance, reducing the need for leaf spraying with other insecticides. Around 85% of the oilseed rape crop in England now uses this method for pest protection.

'Long term, large scale'

But this new work suggests, for the first time, that the detrimental impacts seen in the lab can be linked to large scale population extinctions of wild bees, especially for those species of bees that spend longer foraging on oilseed rape. "The negative effects that have been reported previously do scale up to long-term, large-scale multi-species impacts that are harmful," said Dr Nick Isaac, a co-author of the new paper.

"Neonicotinoids are harmful, we can be very confident about that and our mean correlation is three times more negative for foragers than for non-foragers." There was a decline in the number of populations of 10%, attributable to neonicotinoids, across the 34 species that forage on oilseed rape. Five of the species showed declines of 20% or more, with the worst affected declining by 30%. Overall, half the total decline in wild bees could be linked to the chemicals.

Red River Apiarists' Association

Editor's Note & musings by Ken Rowes

30th of October and bees are covered for winter. I've given those hives with a little bit high mite count and extract kick of Oxalic drip. So you may have a change for a final mite treatment.

We've had the odd snow flake and strong frost on two occasions.

Managed the winter plugs on the Styrofoam hives with Duane Versluis, as described by Waldemar.

To my discouragement I have had some wax moth infestation again like last fall in dead-out brood comb so have cleaned an culled that comb.

Most equipment has been cleaned and stored, now for some wax rendering and the odd craft market before Christmas.

Note:

AccuWeather Global Weather Center – September 28, 2016 – AccuWeather reports it will feel like an extended winter for those living from the northern Plains to the eastern U.S., as cold and snowy conditions stretch into spring 2017. Bitter cold to grip the northern Plains, Midwest -

Old man winter won't hold back in the northern Plains this season with shots of brutally cold air predicted to slice through the region.

Developing snow pack in early December may contribute to even colder weather. Temperatures will plummet as the season goes on, averaging 6 to 9 degrees lower overall than last winter.

"…There are going to be some nights, especially if there's snow cover in the heart of winter, that could get down to 20 or 30 below, especially in parts of Minnesota like International Falls and Duluth and parts of the Dakotas," Pastelok said.

Cold air will also remain entrenched across the Midwest after arriving in late November.

The executive is developing association position outlines so as a clearer support net work can be established. Please consider supporting the association by assisting on one of the committees.

Ads will be reviewed and a new slate begun in January. Do you have beekeeping material for sale or are in need place an ad in the Bee Cause.

CLASSIFIEDS

1 For Sale: Plastic queen excluders $3.50 each. **Contact, Lance W. Phone # 712-6783, Email; lancewld@gmail.com**

2. For Sale: Insulated hive boxes with Metal Lid and Bottom Treys $20; Honey-Frame Display Case $20,; Cobana boxes for comb honey $20; Nuc Boxes $10; Super shells with damaged frames $15; Boxes with wired frames but no foundation $10; Supers and Brood Boxes -$ 20 - $40; Honey pails- various sizes, Hive stands $5; Lids with metal or wood top $10; Bottom boards $5 / Screened Bottom Boards $8; Bee blowers $75-$150; Skunk prevention plates $1; Screened Plastic bottom boards $15; Inner covers $1; Frame building jig and Wiring jig and pre-cut wood pieces for building boxes and frames; Pure beeswax foundation $120 ; Boardman feeder trays, jars and lids $4; Beekeeping suits, gloves, veils, tools -all in excellent condition.
Smokers $20-$25; Fencers for bear protection $75 -$200; Metal Fence Posts, Fencing Wire; Bee Cozies Winter Wrap [new] $15; Mann Lake 3" pro feeders [new] / $25 case of 5.; Misc.
Charles Polcyn at 204 284-7064 or at vernapolcyn@yahoo.ca
Contact Charles_polcyn@ymail.com or Charles 204-284-7064 Wpg. Or farm 204-348-2506.

3. Wanted: Honey **contact: John at**

204-943-0166 Email:honeyb@mymts.net

4. For Sale: Honey from queen rearing classes $2.00 / lbs to members. In 9.5 kg (20.9 lbs) containers. Oct. 30th 17.6% moisture. 11 pails left.
Containers are Ken's and would like them returned.

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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 **Elmwood Legion 920 Nairn 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

"Historically, if you just have (continued on pg 6) (from pg 5) oilseed rape, many bees tend to benefit from that because it is this enormous foraging resource all over the countryside," said lead author Dr Ben Woodcock from the CEH.
"But this co-relation study suggests that once it's treated with neonicotinoids up to 85%, then they are starting to be exposed and it's starting to have these detrimental impacts on them." "What we can't say is what these detrimental impacts are but what it does suggest is you can have these population declines and they can be big - I mean 30% is a big decline." The spined mason bee was one of the 62 species analysed and was seen to suffer population declines. The authors acknowledge that their study finds an association and doesn't prove a cause and effect link between the use of neonicotinoids and the decline of bee populations.
Intensive farming at fault?
The manufacturers of the chemicals agree that it is an interesting statistical study, but they argue that intensive farming and not just a single insecticide might be the real cause of the decline.
"Since most of the oilseed rape grown in the UK was treated with a neonicotinoid seed treatment during the years that this study looked at, we believe its findings would be more correctly headlined that intensive agriculture is causing some issues with pollinators," said Dr Julian Little, from Bayer Crop Science in the UK.
"Whether this is due to the use of insecticides is not clear; a lack of nesting sites and pollen and nectar sources in these areas may also be critical factors." Other scientists, though, believe that the new study is some of the strongest data yet for the impact of these substances over the long term. "This is the first good evidence that bees are affected at the population level by the widespread use of neonicotinoids," said Prof Henrik Smith from Lund University in Sweden, who was not involved with the research. The study looked at wild bees before and after the introduction of neonicotinoids in 2002. "It is the combination of evidence that is persuasive, that the effect depends on neonicotinoid exposure and affect species known to forage on oilseed rape more than other species."
The European Food Safety Authority is currently conducting a review of the scientific evidence about neonicotinoids.
An EU-wide moratorium on their use was implemented in 2013 and is still in place. This new work is likely to be part of that review, along with another, major field study due out in the Autumn. However, the National Farmers Union (NFU) say that it doesn't make a convincing case about the extinction of bees in England.
"While this study claims to provide an important contribution to the evidence base underpinning the current EU moratorium on some uses of neonicotinoids, experts reviewing all the evidence have concluded that there are still major gaps in our knowledge and a limited evidence base to guide policymakers," said Dr Chris Hartfield from the NFU.
The scientists involved in the wild bee study caution against "simplistic solutions" to the problems of pollinators. They say a "holistic" approach to the use of insecticides must be taken and they are lukewarm about the idea of banning chemicals. "When you grow oilseed rape you can't do it without pesticides, there's an underlying reality to this," said Dr Woodcock. "Just because you say 'don't use neonicotinoids anymore', the likelihood is that another pesticide is going to have to be used to compensate for that, that is going to have impacts on runoffs into waterways and on other species that you can control for." "It needs to be taken in a very holistic perspective, you can't just say as long as we can save the bees everything else can go to hell, that's not where you want to be at."

The study has been published in the journal Nature Communications.

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<u>Neonicotinoid pesticides cause harm to honeybees:</u>
Researchers discover new mechanism associated with worldwide decline of bee populations. Johannes Gutenberg, Universitaet Mainz.

ScienceDaily. ScienceDaily, 24 June 2016. <www.sciencedaily.com/releases/2016/06/160624135849.htm

One possible cause of the alarming bee mortality we are witnessing is the use of the very active systemic insecticides called neonicotinoids. A previously unknown and harmful effect of neonicotinoids has been identified by researchers at the Mainz University Medical Center and Goethe University Frankfurt. They discovered that neonicotinoids in low and field-relevant concentrations reduce the concentration of acetylcholine in the royal jelly/larval food secreted by nurse bees. This signaling molecule is relevant for the development of the honeybee larvae. At higher doses, neonicotinoids also damage the so-called microchannels of the royal jelly gland in which acetylcholine is produced. The results of this research have been recently published in the eminent scientific journal *PLoS ONE*.

"As early as 2013, the European Food Safety Authority published a report concluding that the neonicotinoid class of insecticides represented a risk to bees," said Professor Ignatz Wessler of the Institute of Pathology at the University Medical Center of Johannes Gutenberg University Mainz (JGU). "The undesirable effect of neonicotinoids now discovered is a further indication that these insecticides represent a clear hazard to bee populations and this is a factor that needs to be taken into account in the forthcoming reassessment of the environmental risks of this substance

class." Working in collaboration with Professor Bernd Grünewald of the Bee Research Institute at Goethe University Frankfurt, Professor Ignatz Wessler and his team uncovered this previously unknown damaging effect of neonicotinoids that impairs the development of honeybee larvae.

Wessler and Grünewald were able to directly demonstrate that neonicotinoids reduce the acetylcholine content of the larval food produced by nurse bees. Acetylcholine is a signaling molecule produced in the microchannels of the royal jelly gland of nurse bees. Comparable to neonicotinoids, it stimulates the nicotinic acetylcholine receptors that are also present in this gland.

"In lab tests we artificially removed acetylcholine from the larval food and the result was that bee larvae fed with this died earlier than bee larvae that received food containing acetylcholine," explained Wessler. In order to examine the effect of neonicotinoids on the acetylcholine content in the jelly in more detail, bee colonies were exposed to various concentrations of neonicotinoids in flight tunnels (clothianidin: 1, 10 and 100 µg/kg glucose solution; thiacloprid 200 and 8800 µg/kg). "This exposure led to a reduction in the acetylcholine content of the jelly. Thus we were able to demonstrate that the field-relevant dose of the neonicotinoid agent thiacloprid (200 µg/kg) significantly reduces acetylcholine content by 50 percent. On exposure to higher doses, we were even able to verify that acetylcholine content can be reduced by 75 percent. Exposure of the bees with the higher doses results in serious damage to the microchannels and secretory cells of the jelly gland," emphasized Professor Ignatz Wessler. "Our research results thus confirm that the neonicotinoids can jeopardize the normal development of honeybee larvae."

The EU came to a similar conclusion back in December 2013 and imposed temporary restrictions on the use of three neonicotinoids, i.e., clothianidin, imidacloprid, and thiamethoxam. It had already been reported in several scientific publications that high but not lethal doses of various neonicotinoids could be associated with the falls in the populations of wild bees, bumblebees, and queen bees. Also reported were abnormalities in breeding activity and impaired flight orientation in the case of honeybees. However, at the time there were critics of these reports who pointed out that, among other things, the researchers had used high, non-field-relevant doses of neonicotinoids and had carried out their experiments under artificial laboratory conditions. Moreover, the proponents of the use of neonicotinoids cited other possible causes of bee mortality, for example, the proliferation of the varroa mite and other pathogens.

Story Source:

Materials provided by **Johannes Gutenberg Universitaet Mainz**. *Note: Content may be edited for style and length.*

Journal Reference:

1. Ignaz Wessler, Hedwig-Annabel Gärtner, Rosmarie Michel-Schmidt, Christoph Brochhausen, Luise Schmitz, Laura Anspach, Bernd Grünewald, Charles James Kirkpatrick. **Honeybees Produce Millimolar Concentrations of Non-Neuronal Acetylcholine for Breeding: Possible Adverse Effects of Neonicotinoids**. *PLOS ONE*, 2016; 11 (6): e0156886 DOI: 10.1371/journal.pone.0156886

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This I find to be an excellent information document on Oxalic acid for the beekeepers hand.

Update 16 June 2016 on Randy Oliver's

Oxalic Acid treatments.

I recently received an email from a Northeastern beekeeper, Erik Donley, about his experience with applying oxalic vapour to newly-hived package bees. Excerpts follow:

* I installed 10 x 3LB packages (from OHB) in single deep hives. (April 17th) All but one hive had fully drawn out comb. (The 1 was starting with 1 drawn comb and 9 bare foundations)

* On the 8th day after installation I administered the OA treatment. I vaporized approx .75g (between 1/4 and 1/8 teaspoon) of OA into each single deep hive. (I felt that was a reasonable dose given a full 2 deep hive takes roughly 2g)

* I checked the hives 4 days after and everything seemed fine. All continued to have laying queens with solid brood patterns, there were no issues with absconding, or mutiny vs the queen.

* Since installation, the hives have moved to multiple locations across Northern Minnesota and Wisconsin and have been exposed to a variety of difficult weather conditions. (We had snow and freezing temperatures in late May). Thus the robustness of each hive has been slightly weather dependent, but it appears so far they are not populated with Mites.

Erik is planning to follow up with late summer caging of the queen, followed by another formic vaporization–I will post his results. Note: keep in mind that repeating treatments without rotation, will tend to breed for resistant mites. Better to rotate treatments (such as with thymol). Erik questioned me on this:

A reference from X said that due to the mode of action of OA, it is impossible for mites to gain resistance to it.

The above is a good example of someone talking out of their [hat]. No one even knows for sure what the mode of action of OA is against varroa, nor how it is absorbed. And no matter, I can assure you that some mites will be more resistant than others, which implies that some degree of resistance is possible. Remember, there is only a small margin of safety between the dose that kills mites, and the dose that kills bees. **That means that varroa only needs to develop a slight degree of resistance until OA is as toxic to the bees as it is to the mites. Rotate treatments!**

My friend Rob Stone (Pierce Beekeeping) recently treated a number of packages of bees for sale by spraying a total of 30mL of "weak" solution divided over the four sides of the package cages, and was happy with the results.

Original post

Following the lead of many other countries, EPA has finally approved its legal use for control of varroa. My sons and I **(continued on Pg 9)**

(**from pg 8)** have been using oxalic dribble for 15 years with great success. We really like the dribble method due to its low cost, ease of use, safety to the applicator, minimal adverse effects to the colony, and its high efficacy against varroa if applied correctly. Here are some tips:

Application

- The typical dosage of oxalic dribble is 5 mL (1 tsp) per "seam" of bees between the frames. Solution spilled on the top bars doesn't count. I suggest applying it carefully in order to best distribute it throughout the hive.
- Although some researchers caution about applying more than 50 mL per colony, we routinely treat *every* seam of bees, even if it takes close to 100 mL total (we may get away with this because our broodless period in the California foothills is very short).
- For application to only a few hives, use a teaspoon or 60 mL syringe (from any feed store).

Dribble being applied with a 60 mL syringe.

- For commercial use, we use a garden sprayer set to a gentle stream, calibrated by the use of a graduated cylinder, to dispense 5 mL per second (1 seam of bees per second, less than 20 seconds per hive).

Calibrating the output of the stream to 5 mL per second. Tip: maintain a large reservoir of air above the liquid–this will reduce the amount of fluctuation in the flow. With practice, it is easy to eyeball the correct stream.

- In fall, we treat the bees in both brood chambers. If the cluster is mainly in the lower box, we tip the upper box back and apply the oxalic from below. If the cluster is mainly in the upper box, we take off the lid and dribble each box from above.

I'm applying the fall treatment while Eric tips back the upper box. We often work in three's, with two cracking and one squirting.

Treatment windows

- You'll get the highest efficacy against varroa if oxalic dribble is applied when there is no *sealed brood* present. This opportunity occurs as a result of natural or induced brood breaks.
- In temperate regions, natural brood breaks typically occur in November through early December.
- Alternatively, you can induce a brood break by making shook swarms, or by caging the queen for 14 days, as shown below.

By caging the queen for 14 days, you can create a 2-day window in which there is no sealed brood in which varroa can hide. Note that this window occurs starting about 6 days after you release the queen.

Package bees: Aliano and Ellis, in their very well done preliminary investigation into treating package bees with oxalic, found that the spray application of 3 mL of 2.8% (w:w) of oxalic acid in sugar syrup per 1000 bees resulted in very high varroa kill, with minimal bee kill. Since there are roughly 3500 bees per lb, that works out to:

21 mL of 2.8% OA syrup per 2-lb package,

31.5 mL per 3-lb package, or

42 mL per 4-lb package.

The 2.8% solution is roughly the same as the "weak" formula at Treatment Table. The authors note, however, that their results were *preliminary*, and I haven't seen any follow-up research. If you do treat some packages, please let me know the results!

Alternatively, although you could directly treat bees in a package, I'd suggest installing them normally, and *then* treating them ***in the hive*** between Days 5 and 7 after installation. The timing is due to the fact that even if the queen starts laying eggs the day after installation, it wouldn't be until Day 9 that the first brood would be of suitable age for mite invasion. Oxalic dribble kills mites for roughly 3 days after application. Thus, if you dribble the recently-installed package on Day 6, the full effect of the treatment will have taken place prior to the first opportunity for the mites to hide in the brood.

You can also use this method with shook swarms, or for any divide made *without brood*.

Nucs: Starting nucs with queen cells in spring presents a great opportunity for controlling varroa by dribbling on Day 19. *We've now used this method on thousands of nucs, and really like it for getting a "clean start" each spring.*

Figure 1. The theory behind the early treatment of nucs—it's all about timing! There is a brief window of opportunity from Day 19 to Day 21 after make up in which every mite in the nuc is forced out of the safety of the sealed brood. A short-term treatment applied at that precise time could result in a very effective kill of the now-exposed mites!

I've fully described this method at http://scientificbeekeeping.com/simple-early-treatment-of-nucs-against-varroa/.

- An even simpler method is to make "walkaway splits"–that is, splitting a hive (into two or more splits) and allowing the queenless split to raise a new queen (although I do not particularly recommend this method, since it depends upon the splits raising emergency queens, plus the splits go without any new brood production for at least 24 days, during which laying workers may develop). The key is to make up the split containing the old queen ***without any sealed brood*** (so that all the mites are exposed to treatment). Leave this split on the parent stand to pick up the field force. Into the other (queenless) split(s), place all the sealed brood (any open brood is also fine), along with most of the bees (since all the field bees will (**cont'd on pg 10**)

(from pg 9) fly back to the parent stand). Treat the split with the old queen on the day you make the split(s). Treat the queenless splits on any day from Day 21 through Day 30.

Summer treatment

- Oxalic dribble is not as effective when colonies contain brood (as during spring or summer), but colonies at that time do appear to tolerate stronger or repeated doses due to the rapid turnover of the adult population at that time of year.
- I don't have data on efficacy, but I've treated colonies once a week for three consecutive weeks in late summer without noticing adverse effects (although we prefer thymol or formic acid at that time of year).

Mixing, safety, and storage

- There is a narrow range of dosage that will kill varroa without harming the bees. Follow mixing and application rates meticulously; see (http://scientificbeekeeping.com/oxalic-acid-treatment-table/).
- Use common sense when handling oxalic acid crystals. Wear glasses in case of a mishap—you don't want to get it into your eyes! Wear latex or nitrile gloves to remind you not to rub your eyes.

Weigh the oxalic acid crystals carefully–they cannot be accurately measured by volume (such as by teaspoon measurement).

- It's no big deal to get either the crystals or solution on your skin—simply wash off with water. If you suspect that there is some oxalic syrup on your skin, taste it (it tastes like strong lemonade). Don't worry–you eat plenty of oxalic acid in common vegetables. You can completely neutralize an oxalic acid spill with some baking soda dissolved in water.
- If your water is hard (contains calcium), use distilled water instead (calcium will cause some of the oxalic acid to precipitate as white calcium oxalate).
- We prefer to first completely dissolve the crystals in hot water, and then add the sugar.
- Oxalic acid in a sugar solution will eventually form HMF [[a]], which is somewhat toxic to bees. It's unlikely that enough will be formed under normal use to harm the bees, but you should not use a solution that has begun to turn brown. **Oxalic syrup can be stored for many months if kept refrigerated** [[b]].

[a] Hydroxymethylfurfural, non toxic to humans; commonly found in cooked jams and jellies.

[b] Prandin, L, et al (2001) A scientific note on long-term stability of a home-made oxalic acid water sugar solution for controlling varroosis. Apidologie 32: 451–452. *Open access.* —//\\—

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