Red River Apiarists' Association

The Bee Cause

Volume 6, Issue 6 October 2009

Points of Interest:

- Next general meeting is **7;30** Tuesday, **October 13th** at the **River Heights Community Centre, 1370 Grosvenor Ave., Winnipeg.**

Speaker:

Honey Show 2009 In Review

Charles Polcyn with an in-depth view of Beekeeping in the Philippines

Inside this issue:

Effects of Various Entrances and Hive Direction On Outdoor Wintering of Honey Bee Colonies'

by TIBOR I. SZABO Alberta Bee Breeding Program, Research Branch, Agriculture Canada Research Station Box 29, Beaverlodge, Alberta, Canada, TOH OCO

Revised Manuscript Received for Publication Aug. 3, 1982

Summary

One hundred and twenty-eight colonies were wintered during the 1979-1980 and 1980-1981 winters. One of the following treatments was **used** on each hive: (I) bottom and top entrances (1 x 5 cm each), **(2)** fully open bottom entrance, (3) bottom and upper-side entrances (1 **x 5** cm each), (4) bottom entrance (1 x **5** cm) and a **2.5** cm diameter auger hole in the middle of the second chamber. The colonies in two supers were placed in groups of four and packed with R7 fibreglass and building paper.

Each group, representing one treatment had two colonies facing N and two colonies facing S.

Colonies in treatments 1 and 4 consumed less food **than** colonies in treatment 3. Although the spring counts of nosema spores were similar in **all** treatments there was an interaction of years and treatments. Interaction existed with treatments 1 and **2,** 1 and 3, **2** and **4,** and 3 and 4 but not between 1 and **4.** Spring comb space populations for treatments 1 and **4** were identical (8.5) and significantly greater than those of treatments **2** and 3 (7.0 and 5.0, respectively). The capped worker brood area was also larger in treatments 1 and **4** than in treatments, 3044, 3031 and 1976 cm^2, respectively. The comb space populations in south facing colonies were 8.1 and 8.3, significantly greater than in north facing colonies with 6.0 and **6.5** comb spaces. The colonies had less honey stores for the 1979- 1980 winter than for the 1980-81 winter. Although the second winter was shorter and milder, the population, capped worker and drone brood of the colonies was larger **during** the 1980 spring than ***daring*** the 1981 spring.

INTRODUCTION

THE PRACTICAL aspects of wintering have been reviewed by Johansson and Johansson (1969) and they have also summarized studies on the honey bee colony in winter (Johansson and Johansson, 1979). The first review provided a ten point summary for successful wintering. Among these points it was advised to locate hives on a slope facing the sun and to provide a top emergency exit and ventilation for each colony. When 4 or more colonies are packed together it is not possible to provide all colonies with optimum direction. If 2 colonies are facing south in a 4-colony pack, then **2** colonies will face to the north.

A comparison of 4-colony, 2-colony and single colony packs was conducted by Luther from 1926 to 1932 at Lethbridge, Canada (Edmunds, 1961). The number of colonies alive and strong was 95.8% for 4-colony packs, 77.4% for 2-colony packs and 70.3% for single-colony packs (Edmunds, 1961). Recently the 4 and multiple colony packs have become very popular (Szabo, 1974, Bland, 1977 and Peer, 1978). Ventilation is provided through bottom and top entrances, each of which is approximately 1 x 5 cm (Szabo, 1980). Johansson and Johansson (1969) mentioned a ventilation hole of 1.25 cm in diameter as a second entrance, in the middle of the second brood chamber. Furgala (1975) advised a 0.6 x 7.6 cm bottom entrance and a 2.2 cm to 2.5 cm auger hole upper entrance.

(Continued on page 4)

2009 Executive

President: Charles Polcyn
Ph 284-7064
845 Kebir
Winnipeg,MB
Email: charlespolcyn@yahoo.com.

1st Vice President: John Badiuk
Ph .943-0166
1413-411 Cumberland Ave
Winnipeg, MB R3B 1T7
Email:honeyb@mts.net

2nd Vice President: Brian Smith
Ph 204-373-2527
P0 Box 423
Emerson, MB. R0A 0L0
Email: smthbgsl@mts.net

Secretary: Ron Rudiak
Ph 326-3763
216 Loewen Blvd.
Steinbach, MB R5G 0E5
Email: manbeekr@mts.net

Treasurer: John Speer
Ph 222-3007
Box 16, Group 555, RR 5
Winnipeg, MB R2C 2Z2
Email: jurnss@mts.net

MBA Delegate: Jim Campbell
Ph 467-5246
Box 234
Stonewall, MB R0C 2Z0
Email: jaycam@mts.net

Reporter: Ron Rudiak
Ph 326-3763
216 Loewen Blvd.
Steinbach, MB R5G 0E5
Email: manbeekr@mts.net

Newsletter Editor:
Ken Rowes
Ph 204-755-3427
Cloverleaf Box 758
RR1 Anola, MB R0E 0A0
Email: Roweskd@mts.net

Presidents Comments October, 2009

The hot days of summer arrived in mid-September and made everybody happy in the fields, the beaches and in the bee yards. Bees foraged for nectar at every opportunity and did find some to bring back to the hives, but the quantity was limited by location of the yards. The hours of flying time were limited as well with the daylight hours decreasing but quite a lot of honey did come in. BUT the preparation of the hives for cool weather and winter should be well underway now by all beekeepers as medications and syrup feeding cannot be delayed any longer. The time for honey collection is over.

The recent update on Colony Collapse Disorder (CCD) seems to indicate no definite cause, but does suggest that high varroa mite numbers were always a factor that made the bees more susceptible to a variety of viral infections. Thus the lesson for all beekeepers is to decrease varroa mite numbers in the fall so that the bees have a better chance of coming through the winter successfully.

Varroa mite numbers should be monitored at this time of the year by alcohol washes and /or sticky boards and your miticide plan put into action. The two types of strips, Apistan and Checkmite, used in former years may no longer be effective in your hives due to the development of resistance by the varroa mites. If your alcohol washes indicate large mite numbers, and your white or brown strips don't provide much of a mite drop on your sticky boards, be suspicious of the effectiveness of those miticides, and consider using the Apivar mite strips for the next few years. BUT, follow the Apivar label instructions exactly, and don't forget to pull those strips out before wrapping the bees up or putting the bees away indoors for the winter. If we all do that, we may be able to get more years of use for this new miticide. Formic Acid and Oxalic Acid are other tools to use for varroa mite controls, but their use is temperature sensitive, so watch your five day weather forecasts.

The Manitoba Honey Show takes place on October 9th to October 11th at the middle area of The Forks. The theme this year for the Honey Show is: ***Pollination and the Foods we Eat***. This emphasis should connect very well with the concerns we all have on the value of honeybees in our province and our country. "How much of the food on our table requires pollination?" is a question that this year's honey show will try to answer.

The deadline for submitting entries for the show is 4 PM on October 6th at the Bee Maid offices on Roseberry Street. Information on the Honey Show is available on line at www.manitobabee.org or at www.BeekeepingManitoba.com as well as at the beekeeping supply desk. Jake and Mike also have information sheets available.

I want to thank the following Red River Apiarist members: Margaret Smith, Ted Scheuneman, Sandra Smith, Janice Lupinetti, Vera Mandryk, John Speer, Ken Rowes, and Brian Smith who have already volunteered to take a 4 hour shift at the honey show. **There is still a need for more volunteers at the honey show , so please give me a call at 284-7064 so that I can fit you into a time slot where help is needed. There are a total of nine (9) time slots available that need coverage to provide information to the very interested public. The need is for 4 volunteers on Friday, 3 on Saturday, and 2 on Sunday. Remember that any shift volunteer receives a Forks Gift Certificate for your personal use at any of the Forks businesses.**

Also mark October 21st on your calendar for a symposium on Honey Bee Viruses at the Fort Garry Hotel. This should be of interest to many beekeepers and is at a reasonable price. Contact Dave Ostermann at (204) 945-3861 for more details on this event.

There are two more RRAA meetings in 2009, one on October 13th , and the other on November 10th. The October meeting will feature a brief summary of the recent Honey Show and a presentation on Beekeeping in the Philippines by Charles Polcyn, a CESO volunteer who worked in the Philippines for 2 months

early in 2009. The November meeting will be a combination of beekeeping members personal "Gadget Night Presentation and Display" and a informal Social Evening to conclude the RRAA 2009 year.

I hope to see many of your honey entries at the honey show, and look forward to seeing many of you at the Honey Show Thanksgiving weekend.

Yours in Beekeeping - Charles Polcyn RRAA President

—//\\—

Minutes of the RRAA General Meeting
River Heights Community Club - September 8, 2009

7:30 PM: Twenty-nine members and guests were in attendance. Charles Polcyn welcomed everyone with a synopsis of our Manitoba summer (that we almost didn't have).

Honey production in eastern Manitoba was adversely affected by a series of cool and cloudy days alternating with rain and more rain. Generally the honey bee colonies are strong and our concern now is to remove the last boxes of honey and prepare them for the winter ahead. This evening, David Ostermann will talk about the things to watch for in our colonies as we begin the fall season.

Minutes of the May 12 meeting approved: Moved by Gilles Lantagne and seconded by George Chwist to approve the minutes as published in the September *Bee Cause*.

A Summer Swarm and a Fifty Dollar Donation for RRAA: Charles described the details about a swarm he was called upon to remove. It seems that a swarm of honey bees had selected the underside on a roof overhang on a fairly high building to settle down. The caller informed Charles that he knew that bees were important and did not want to call an exterminator to have them destroyed. Charles, working on a tall ladder and with considerable difficulty, was able to capture the swarm. For his efficient work, the grateful building owner asked if he could pay him for his time and effort. Charles suggested that payment could be given to the RRAA in the form of a donation.

Meeting Room Reserved: Arrangements have been made with the RHCC to reserve the meeting room for the rest of the season.

MBA Report: Jim Campbell informed the RRAA members of the honey industry's need to have crop insurance for honey production. Discussions are ongoing with Manitoba Agricultural Services Corporation (Crop Insurance) in this regard as well as providing some basic level of insurance for wintered colonies.

MBA board representatives recently met with Manitoba Minister of Agriculture Roseanne Wowchuck, to discuss some of the problematic issues in the honey bee industry:

1) Foreign workers continue to be delayed in the application paperwork changes and omissions by Human Resources and Skills Development Canada (HRSDC). These delays are causing major problems for many of the larger honey producers across the Prairies who cannot get local workers.

2) Cost Recovery for the disease inspection program will remain the same as last year when the Manitoba Beekeepers' Assoc. paid out $12000 to the Provincial Gov't to maintain this very necessary program.

The Honey Bee Virus Interactions Symposium will be held on October 21 at the Ft. Garry Hotel. Those wishing to attend should contact David Ostermann (204)945-3861.

Manitoba Beekeepers' Honey Show: Charles circulated a sign-up sheet for volunteers and 500 gram glass jars were provided for members to use for entering the honey competitions. Competition categories and regulations are available on RRAA's website.

Loonie Draw: Our regular Loonie draw is made on a variety of items which some fortunate people get to take home. Most items are new but others have been "slightly used" and need a new home. This month Janice Lupenette's name was drawn for 4 # Honey Tin. Alex Lloyd won a container of kapok honey produced in Thailand. Vera Mandryk won a large (10#) plastic honey pail donated by Ted Scheuneman. Sean Annell received a calendar and Stan Huzey received the reprint of National Geographic's "Life of the Honeybee". Winners of little packages of chocolate bees from Germany were; Donna Hourd, Sandra Smith, Brian Little and Gilles Lantagne. A big thank you to those who donated draw items and Loonie draw participants.

Ron Rudiak, recorder - RRAA

—//\\—

Mead, Melomels and Metheglins

Mead is the beverage from fermenting honey and water with yeast. It can be said that the mead-making craft is ancient and hasn't changed. You may have read Brother Adam's beekeeping articles from Buckfast Abby and others but the art hasn't change.

What is unique is the regional honey used. Note that any additives other than the basics stated above changes the drink:

Mead is honey, water and yeast.

Melomels are fermented honey and fruit juices. Payments from grapes of a specific region another is Cysers from apple juices.

Metheglin (Welsh meaning medicine) was made from herbs.

Most people know that the word "Honeymoon' comes from the practice of drinking honey wines after weddings, —//\\—

(continued from page 1)
Some beekeepers have the bottom entrance completely open and provide no top entrance on a multiple pack (Oldershaw, 1980, personal communication). The effects of various entrances, hive locations and direction on the wintering of honey bee colonies were investigated in this study.

MATERIALS AND METHODS

A total of 128 colonies of honey bees in standard Langstroth hives were wintered in 1979-80 and 1980-81. The honey bee stock originated from Alberta. After the honey flow, during August these colonies were restricted to two brood chambers. Each colony contained an estimated 5 kg of bees. During September the colonies were provided with some capped honey and were fed with 4.5 L sugar syrup
(60%) containing 100 mg of fumagillin. The food was supplied so that each colony without the metal hive cover reached a total weight of approximately 60 kg. One of the treatments below was applied to each experimental colony: (1) each hive was provided with a bottom and a top entrance (each 1 x 5 cm) both on the front of the hive, (2) the bottom entrance (1.5 x 37 cm) was left fully open, (3) a bottom and a top-side entrance was provided (each 1 x 5 cm). The side entrance was cut into the middle of the side rim of the inner cover, and (4) a bottom entrance (1 x 5 cm) and a 2.5 cm diameter hole in the middle of the second brood chamber were provided. Both entrances were on the front of the hive. The auger hole entrance was 30.3 cm above the bottom entrance. All bottom entrances were provided with nail grid or wire mesh of approximately 6 mm.

Each treatment was represented by groups of 4 colonies and replicated 4 times in a randomized complete block design. At the end of October all colonies of the same treatment were packed tightly together in groups of 4. In each group, two colonies were facing north and two were facing south. They were wrapped with R7 fibreglass insulation on the sides and double insulation on the top . The fibreglass was covered with building paper. Entrance holes Beekeepers' Association. were cut through the building paper and fibreglass. The **January 1983 47** building paper was folded in over the colonies and covered
with a 122 x 122 cm sheet of building paper. The paper and fibreglass were fastened with baler twine. Coloured plywood pieces (10 cm x 15 cm x 0.8 cm) with approximately 2 x 6 cm openings or 2.5 cm diameter holes were nailed to the top entrances. The packs remained on the colonies until the hives were weighed during the spring. The hives were weighed during October and again in April or early May. The food consumption by a colony was considered to be the weight difference between fall and spring. During May the capped brood area was measured to the nearest 10 cm2 with a plexiglass grid. The
population was estimated by the number of combs completely covered with bees. Each such comb was regarded as one comb space of population. Samples of 25 bees per colony were collected from the hive entrances prior to the fall feeding and before the first inspection at the end of April. These bees were examined for nosema spores as described by Shimanuki and Cantwell (1978).

RESULTS AND DISCUSSION

Colonies with bottom and upper entrances on the front of the hive (treatments 1 and 4), performed better than colonies with fully open bottom entrances (treatment 2), or reduced bottom entrances and upper-side entrances (treatment 3), (Table 1). Colonies in treatment 1 and 4 consumed less food, had greater populations and had more capped worker and drone brood than colonies in treatment
3. Treatment **3** also had smaller population than treatment 2. Treatments 1 and 4 were similar or identical
in all but one characteristic, the area of capped drone brood. The treatment 4 entrance arrangement was more favourable for drone production. Although the fall and spring counts of nosema spores were similar in all treatments, there was a significant interaction between years and treatments (Fig. 1). This interaction was significant between treatments 1 and 2, 1 and 3, 2 and 4, and **3** and 4. There was no significant interaction between years and treatments 1 and 4 (Fig. 1). The nosema counts with treatments 1 and 4 decreased from 1980 to 1981 whereas during the same time with treatments 2 and 3 the nosema counts sharply increased. During the spring of 1980 the number of spores per bee in treatment 2 was 4.6 x 106, the lowest count of all treatments. During the spring of 1981, treatment 2 had the highest nosema count of 14 x 106 spores per bee. For some winter losses, there is little explanation available (Szabo, 1974). The same method of wintering could be successful during one winter and could be the cause of failure during another as the nosema counts indicate above.
The hive location in a 4-colony pack had little effect on food consumption, level of nosema and capped brood. However, the south facing colonies had approximately 25% more bees than the north facing colonies (Table 1). This difference in population can be explained by the following observation. During very cold days (-30 to -42OC), the moisture generated by the metabolic process of the colony congealed in the upper entrances. This ice was usually melted by the sun on hives facing east or south but not on the north facing ones. Usually this ice was snowy and allowed the air to pass through. However, sometimes in the north facing upper entrances solid ice develops. I observed this ice being suddenly melted down by the colony and an estimated 50 to 100 bees rushing out of the hive. Some of the bees flew 10 to 20 m to die in the snow. At this time the moist air leaving the hive was visible as water vapour.

A possible explanation for this phenomenon is that since the bottom entrance was also closed with ice, the CO2 concentration probably rose to undesirable levels. Seeley (1974) found that a colony of bees detected small increases in CO2 concentration and responding with fanning. In an airtight hive, the fanning activity and agitated movement of the bees would increase the hive temperature to a point where the ice at the entrance melts.

All colonies survived the winter, but the populations of north
(continued on page 8)

Solving the Mystery of the Vanishing Bees March 31, 2009

The mysterious ailment called colony collapse disorder has wiped out large numbers of the bees that pollinate a third of our crops. The causes turn out to be surprisingly complex, but solutions are emerging

By Diana Cox-Foster and Dennis vanEngelsdorp

Dave Hackenberg makes a living moving honeybees. Up and down the East Coast and often coast to coast, Hackenberg trucks his beehives from field to field to pollinate crops as diverse as Florida melons, Pennsylvania apples, Maine blueberries and California almonds.

As he has done for the past 42 years, in the fall of 2006 Hackenberg migrated with his family and his bees from their central Pennsylvania summer home to their winter locale in central Florida. The insects had just finished their pollination duties on blooming Pennsylvanian pumpkin fields and were now to catch the last of the Floridian Spanish needle nectar flow. When Hackenberg checked on his pollinators, the colonies were "boiling over" with bees, as he put it. But when he came back a month later, he was horrified. Many of the remaining colonies had lost large numbers of workers, and only the young workers and the queen remained and seemed healthy. More than half of the 3,000 hives were completely devoid of bees. But no dead bees were in sight. "It was like a ghost town," Hackenberg said when he called us seeking an explanation for the mysterious disappearance.

We and other researchers soon formed an interdisciplinary working team that by December 2006 had described the phenomenon and later named it colony collapse disorder, or CCD. Curiously, Hackenberg's colonies stopped dying the following spring, but by that time only 800 of his original 3,000 colonies had survived. As Hackenberg spoke to colleagues around the nation, it became apparent that he was not alone. And a survey our team conducted in the spring of 2007 revealed that a fourth of U.S. beekeepers had suffered similar losses and that more than 30 percent of all colonies had died. The next winter the die-off resumed and expanded, hitting 36 percent of U.S. beekeepers. Reports of large losses also surfaced from Australia, Brazil, Canada, China, Europe and other regions. More recent data are not available yet, but some beekeepers say they have seen their colonies collapse this winter, too.

The bee loss has raised alarms because one third of the world's agricultural production depends on the European honeybee, *Apis mellifera* the kind universally adopted by beekeepers in Western countries. Large, monoculture farms require intense pollination activity for short periods of the year, a role that other pollinators such as wild bees and bats cannot fill. Only *A. mellifera*can deploy armies of pollinators at almost any time of the year, wherever the weather is mild enough and there are flowers to visit.

Our collaboration has ruled out many potential causes for CCD and found many possible contributing factors. But no single culprit has been identified. Bees suffering from CCD tend to be infested with multiple pathogens, including a newly discovered virus, but these infections seem secondary or opportunistic much the way pneumonia kills a patient with AIDS. The picture now emerging is of a complex condition that can be triggered by different combinations of causes. There may be no easy remedy to CCD. It may require taking better care of the environment and making long-term changes to our beekeeping and agricultural practices.

Even before colony collapse, honeybees had suffered from a number of ailments that reduced their populations. The number of managed honeybee colonies in 2006 was about 2.4 million, less than half what it was in 1949. But beekeepers could not recall seeing such dramatic winter losses as occurred in 2007 and 2008. Although CCD probably will not cause honeybees to go extinct, it could push many beekeepers out of business. If beekeepers' skills and know-how become a rarity as a result, then even if CCD is eventually overcome, nearly 100 of our crops could be left without pollinators and large-scale production of certain crops could become impossible. We would still have corn, wheat, potatoes and rice. But many fruits and vegetables we consume routinely today such as apples, blueberries, broccoli and almonds could become the food of kings.

Silent Bloom

When Hackenberg initially told us of his vanishing bees, our first thought was varroa mites. These aggressive parasites were largely responsible for a 45 percent drop in the number of managed bee colonies worldwide between 1987 (when they were first introduced in the U.S.) and 2006. Mature varroa females feed on hemolymph, the bees' blood. The mites also carry viruses and actively inhibit the hosts' immune responses. Hackenberg, like most expert beekeepers, already had long experience fighting mites, and he was adamant that, this time, the symptoms were different.

One of us (vanEngelsdorp) performed autopsies on Hackenberg's remaining insects and found symptoms never observed before, such as scar tissue in the internal organs. Initial tests also detected some of the usual suspects in bee disease. In the gut contents we found spores of nosema, single-celled fungal parasites that can cause bee dysentery. The spore counts in these and in subsequent samples, however, were not high enough to explain the losses. Molecular analysis of Hackenberg's bees, performed by the other of us (Cox-Foster), also revealed surprising levels of viral infections of various known types. But no single pathogen found in the insects could explain the scale of the disappearance.

In other words, the bees were all sick, but each colony seemed to suffer from a different combination of diseases. We hypothesized that something had compromised the bees' immune system, making them susceptible to any number of infections that healthy colonies would normally fend off. And Hackenberg was right: the prime suspects, varroa mites, were not present in numbers significant enough to explain the sudden die-off.

In the spring of 2007 our task force began detailed, countrywide surveys of all aspects of colony management, interviewing operators who had encountered CCD as well as those who had not. These and subsequent investigations ruled out several potential causes. No single beekeeping management method could be blamed. Large commercial beekeepers were as likely to suffer from high losses as were small operations or hobbyists. The symptoms affected stationary beekeepers as well as migratory ones. Even some organic beekeepers were affected.

As media reports of the die-offs surfaced, the public also started expressing concern. Many were eager to share their ideas as to the underlying cause. Some of these proposals such as blaming CCD on radiation from cell phones originated from poorly designed studies. Other hypotheses were untestable at best, such as claims that the bees were being abducted by aliens.

One theory favored by many concerned citizens was that bees could have been poisoned by pollen from genetically modified crops, specifically the so-called Bt crops. Bt crops contain a gene for an insecticidal toxin produced by the bacterium *Bacillus thuringiensis*. When pest caterpillars feed on crops producing these toxins, they die. But already before the onset of CCD, research had shown that the Bt toxin becomes activated only in the guts of caterpillars, mosquitoes and some beetles. The digestive tracts of honeybees and of many other insects do not allow Bt to work.

(continued on page 7)

Red River Apiarists' Association

Editor's Note by Ken Rowes

We're walking out of September and the frost has already hit. I dropped by the Honey Coop yesterday and the honey tanks are being filled to feed the bees. Fumidil and Apivar are the items of the day for bee treatments. Mite checks should be completed and the days are numbered to get a treatment in.

The buzz of the day is the Manitoba Honey Show. As a person in the bee business it is a must to interested, to visit or even take part if time allows.

Taking part is merely providing entries such as filling 3 jars with your honey, labelling and dropping it off at the honey Coop. Submitting an 8x10 photo on bees or pollination is something you can have fun in sharing.

If you've been one of the very few who has been into the art of creating your own Honey beverages this is the year to show case this unique attribute of honey products. As this category unfolds we shall benefit as it is a prize beyond the norm and in many parts of Canada honey wines are show casing regions in Bed & Breakfast establishments.

Taking part in the honey show is a privilege you can't miss so come-on out and help—bring a friend. You may want to ware white to show you are a beekeeper.

Don't forget the ***APICULTURE SYMPOSIUM*** the add is on page 10. This will be a classic!

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

CLASSIFIED

1. For Sale: Strong 5 frame nucs, some with laying queens $150; 4 frame nucs $125; 3 frame nucs $110. Available approximately May 15 weather permitting. Ph Dennis Ross 878-2924

2. **For Sale:** April-May 2009 well established strong healthy 4-frame nucs with queens bred from my own gentle hardy local stock. No foulbrood, chalkbrood, nosema, tracheal mites, varroa count very, very low in my apiary. Also for sale: inner covers (new) out of 3/8" plywood outer rim 7/8" + 7/8" pine $7.50. Ph Ted Scheuneman 338-6066, West St Paul

3. **For Sale:** Frames of brood and bees, also nucs available after May 15, 2009. Ph Mike Grysiuk at (204)831-0691, (204)330-1714 or (204)799-7973

4. **For Sale:** 4 and 5 frame nucs available with 2008 queens. Available mid to late May, depending on the weather.
Wanted: Conical bee escape boards, or Conical bee escapes. Contact Lance Waldner (204)433-2517, cell 712-6783 or lancewld@gmail.com

5. **Wanted:** beekeeper to place 10 hives on 40 acre property south of Gimli, on share honey crop basis.
For details, call Ted Rebenchuk at 642-1338.

6. FOR SALE: Jabsco 15050-0675, food grade 316 stainless, pedestal pump (standard 2" Sanitary Threaded Ports). The 15050 is rated at 50 gpm (water) and is also used to pump foods like honey, jam, relish and peanut butter. All bearings, O-rings, wear plates, shaft seal and impeller have been replaced with new Jabsco parts to provide new performance. New price is $2520(US). Will sell for $1250. Call

Ron Rudiak (204)326-3763 or e-mail manbeekr@mts.net

Wanted: beekeeper to place hives on 5 acres apples, 150 acres alfalfa, and canola in McDonald MB. access paved Near Hwy 1 and 16 beginning May pollination call **Kevin Hofer 204-56-3181**

Wanted: S.S Bottling Tanks Single wall or double wall with water jacket, good condition or repairable. Also needed—Belt Barrel Heater for drums: **call Brian Rich 204 739-5481**

For Sale: 30 Frame Maxant Extractor. please call **Javad Niazi At 885-0576 or javadniazi@yahoo.ca ——//\\——**

(*continued from page 5)*

Another popular theory, and a more credible one, blamed synthetic poisons. The two main suspects were acaricides chemicals beekeepers use to keep mites in check and pesticides, either in the environment or in the very field crops the bees were pollinating. By 2006 newer types of pesticides had replaced older varieties. One type in particular, the neonicotinoids, had been blamed by beekeepers in France and elsewhere for harming insect pollinators. This class of insecticides mimics the effects of nicotine a natural defense that tobacco plants deploy against leaf-eating pests and is more toxic to insects than it is to vertebrates. But neonicotinoids also enter the pollen and nectar of the plant not just the leaves thus potentially affecting pollinators. Previous research had demonstrated that neonicotinoids decrease honeybees' ability to remember how to get back to their hive, a sign that they could be a contributor to CCD.

We and other experts also suspected that the bees' natural defenses might be undermined by poor nutrition. Honeybees and wild pollinators, too no longer have the same number or variety of flowers available to them because we humans have tried to "neaten" our environments. We have, for example, planted huge expanses of crops without weedy, flower-filled borders or fencerows. We maintain large green lawns free of any "weeds" such as clover or dandelions. Even our roadsides and parks reflect our desire to keep things neat and weed-free. But to bees and other pollinators, green lawns look like deserts. The diets of honeybees that pollinate large acreages of one crop may lack important nutrients, compared with those of pollinators that feed from multiple sources, as would be typical of the natural environment. Beekeepers have attempted to manage these concerns by developing protein supplements to feed colonies although the supplements have not on their own prevented CCD.

All-Out Effort

Our task force focused its investigation on these two broad areas pesticides and nutrition in addition to the other obvious possibility, that a new or newly mutated pathogen could be causing CCD. Tests of our three hypotheses required collecting samples lots of samples. We joined Jeff Pettis of the U.S. Department of Agriculture lab in Beltsville, Md., to conduct this monumental effort that involved long days, lots of miles on the road and the challenge of collecting enough material to share with the entire team. With no dead bees to study, we decided to collect live bees from apiaries in the midst of collapse, based on the premise that survivors would harbor the disease in its early stages. Bees were collected in alcohol for varroa and nosema counts. Bees, pollen and honeycomb wax were frozen on dry ice and rapidly shipped back to labs in Pennsylvania or Maryland to be stored in ultracold freezers and preserved for molecular and chemical analyses.

Some samples were sent to our colleague David Tarpy of North Carolina State University, who measured protein content. Tarpy found no notable difference between apiaries that had CCD and others that were seemingly healthy. His results suggested that nutritional state on its own could not explain CCD.

Much more startling was the outcome of our team's search for pesticides, for which we enlisted the help of Pennsylvania State University researchers Maryann Frazier, Jim Frazier and Chris Mullin and of Roger Simonds, a chemist at the USDA lab in Gastonia, N.C. (By coincidence, Simonds happens to be a beekeeper himself.) His broad-spectrum analysis, sensitive to insecticides, herbicides and fungicides, found more than 170 different chemicals. Most stored-pollen samples contained five or more different compounds, and some contained as many as 35. But although both the levels and the diversity of chemicals are of concern, none is likely to be the sole smoking gun behind CCD: healthy colonies sometimes have higher levels of some chemicals than colonies suffering from CCD.

No neonicotinoids were found in the original samples. But these or other pesticides cannot yet be exonerated. Honeybee colonies are dynamic, and our initial sampling was not we took samples only once. It remains possible, if not likely, that bees afflicted by CCD were harmed by a chemical or mixture of chemicals not evident at the time we collected samples.

Our attempts to identify a new infectious disease or a new strain of an old one that could be at the root of CCD initially looked as if they would go nowhere fast. None of the known bacterial, fungal or viral diseases of bees could account for the CCD losses, so we had no clue what to look for.

Then Cox-Foster, with Ian Lipkin's group at Columbia University (and with help from biotech company 454 Life Sciences in Branford, Conn.), turned to a sophisticated microbe-hunting method called metagenomics. In this technique, nucleic acids (DNA and RNA) are collected from an environment containing many different organisms. The genetic material is all blended together and minced into pieces short enough that their sequences of code "letters" can be deciphered. In ordinary gene sequencing, researchers would then use computer software to put the pieces back together and reconstruct the genome of the original organism. But in metagenomics, the genes belong to different organisms, and so sequencing produces a snapshot of the sequences in a collection of organisms, including microscopic ones, in an ecosystem. Metagenomics has been used to survey environments such as seawater and soil, revealing a surprising diversity of microorganisms. But it can also be applied to detecting microorganisms hosted by a larger organism, living either as collaborators (in symbiosis) or as infections.

Naturally, most gene sequences in our samples were from the bees themselves. But those were easy to filter out because, fortunately, the honeybee genome had just been sequenced. Nonbee sequences were then matched to genetic sequences belonging to known organisms. Researchers with expertise in molecular analysis of organisms including bacteria, fungi, parasites and viruses joined our team to identify potential culprits.

The CSI-style investigation greatly expanded our general knowledge of honeybees. First, it showed that all samples (CCD and healthy) had eight different bacteria that had been described in two previous studies from other parts of the world. These findings strongly suggest that those bacteria may be symbionts, perhaps serving an essential role in bee biology such as aiding in digestion. We also found two nosema species, two other fungi and several bee viruses.

But one bee virus stood out, as it had never been identified in the U.S.: the Israeli acute paralysis virus, or IAPV. This pathogen was first described in 2004 by Ilan Sela of the Hebrew University of Jerusalem in the course of an effort to find out why bees were dying with paralytic seizures. In our initial sampling, IAPV was found in almost all though not all colonies with CCD symptoms and in only one operation that was not suffering from CCD. But such strong correlation was not proof that IAPV caused the disease. For example, CCD could have just made the bees exceptionally vulnerable to IAPV infection.

Case Closed?

From subsequent work on IAPV, we know that at least three different strains of the virus exist and that two of them infect bees in the U.S. One of the strains most likely arrived in colonies flown in from Australia in 2005 after (continued on page 9)

(continued from page 4)
facing colonies were less than those of the south facing colonies. Since the wintering method using 4-colony packs makes it unavoidable to face two colonies in an undesirable direction, modifications that reduce icing in the upper entrances should improve wintering success. The south facing colonies may have started brood rearing earlier and this could have contributed to a larger bee population.

The honey bee colonies had less food consumption for the 1979-1980 winter than for the 1980-1981 winter. The time period between the fall and the spring weighing of the colonies was 194 days in 1979-1980 and 210 days in 1980-1981. The difference in food consumption during the two winters was possibly due to this difference in weighing time.

The 1979-1980 winter was colder and the bees were confined in the hive longer than during the 1980-1981 winter. During both winters the bottom entrances were covered with snow for an undetermined period of time. The first flight of bees was observed on February 25, 1980 and on January 20, 1981. During both days the ground was completely covered with deep snow and there was bright sunshine and no wind. The bees flew a distance of approximately 20 to 40 meters to collect water from the melting snow. In spite of theses favourable weather conditions the temperature later dropped to as low as -31C in March, 1980 and to -27 C in February, 1981. The first pollen was collected by bees on April 11, 1980 and on March 13, 1981. In spite of these conditions the spring populations, capped worker and drone brood were greater during the spring of 1980 than of 1981.

Wintering the 4-colony packs with front-bottom and upper entrances has been developed and slowly improved by many beekeepers. Unfortunately, large scale failures were very seldom reported (Szabo, 1974). This study confirms that treatment 1 is a reliable method but still needs improvement, especially in avoiding facing of the colony entrances to the north. The colonies were not facing to the west because this is the dominant wind direction and this is obviously detrimental to the honey bee colonies.

Since all colonies had slight infections of nosema disease during early fall and were designed randomly for the various treatments, the wintering results were not affected by this factor. The quantity of drug which controls nosema disease in western Canadian conditions has not been tested experimentally. In the past, large commercial beekeepers did not use Fumidil B for nosema control (Peer, 1978). Fall feeding with large quantities of sugar syrup is sometimes difficult because the bees will not take the syrup in spite of favourable conditions. For these reasons 100 mg fumagilin, half the amount recommended by Baily (1981) were fed per colony in the present experiment.

TABLE 2

Year and month	Mean	Mean Max	Mean Min	Extreme Max	Extreme Min
1979-1980					
October.	5.6	10.6	0.6	22.0	-7.5
November.	- 1.0	3.9	-5.8	17.0	-17.0
December	-8.9	-3.3	-14.5	8.5	-35.0
January	-17.0	-12.2	-21.7	7.5	-42.5
February	-6.9	-2.5	-11.3	7.0	-23.5
March	-5.8	-0.9	-10.7	8.5	-31.0
April.	7.3	14.3	0.3	25.0	-5.5
May	10.7	16.8	4. 6	28.0	-2.5
1980-1981					
October.	7.2	12.4	1.9	25.5	-6.0
November.	0.3	4.3	-3.8	13.0	-20.0
December	-17.0	-12.4	-21.5	11 .O	-38.0
January.	-4.0	0.7	-8.6	7.5	-17.0
February	-6.7	-1.9	-11.4	7.0	-27.0
March	-0.2	5.0	-5.4	11.0	-16.5
April	2.2	6.9	-2.6	18.5	-15.5
May	11.7	18.3	5.1	26.0	-1.0

ACKNOWLEDGEMENTS

I thank K. Burton and J. L. Harris for technical assistance.

REFERENCES

Bailey, L. (1981) Honey bee pathology. **Academic Press.**

Bland, E. (1977) Wintering honeybees in Saskatchewan. **Glean. Bee Cult.** 105 (11):485-487 and 514.
Edmunds, J. W. (1961) Wintering bees in Alberta **Glean. Bee Cult.** 89 (11) :654-657
Furgala, B. (1975) Fall management and the wintering of productive colonies. In: Grout. R., The hive and the honey bee. **Dadant and Sons,** Hamilton. Illinois p. 471-490.
Johansson, T. S. K.; Johansson, M. P. (1969) Wintering. **Bee Wld.** 50 :89-100
Johansson, T. S. K.; Johansson, M. P. (1979) The honey bee colony in winter. **Bee Wld.** 60 (4):155-170
Peer, D. F. (1978) A warm method of wintering honeybee colonies outdoors in cold regions. **Canad. Bee keep.** 7 **(3)** :33 and 36
Seeley, T. D. (1974) Atmospheric carbon dioxide regula tion in honey-bee **(Apis mellifera)** colonies. **J. Insect Physiol.** 20: 2301-2305
Shimanuki, H.; Cantwell, Q. E. (1978) Diagnosis of honey bee diseases, parasites, and pests. **USDA.** 18 pp.
Szabo, T. I. (1974) Outdoor wintering of honey bee colo nies in the Nipawin area of Saskatchewan. **Canad. Beekeep.** 4 (12): 89-91
Szabo, T. I. (1980) Outdoor wintering of Italian and Cauca sian- Italian hybrid honey bees. **Am. Bee J.** 120 **(7)** :513-514 and 517 January **1983**

(continued from page 7)

the U.S. government lifted a ban on honeybee importation that had been in effect since 1922. (The almond industry lobbied to lift the ban to prevent a critical shortage of pollinators at blossom time.) The other strain probably showed up earlier and is quite different. Where that one came from is unknown; it may have been introduced by way of importation of royal jelly (a nutrient bees secrete to feed their larvae) or a pollen supplement, or it may have hitchhiked into the country on newly introduced pests of bees. The data also suggest that IAPV has existed in bees in other parts of the world for a while, developing into many different strains and possibly changing rapidly.

In an effort to settle the issue of IAPV's role, Cox-Foster experimented with healthy honeybees that had no previous exposure to the virus. Her team placed hives filled with bees into greenhouses and fed the insects sugary water laden with IAPV. Sure enough, the infection mimicked some symptoms of CCD. Within one or two weeks of exposure, the bees began to die, twitching with paralytic seizures on the ground. The bees were not dying near the hives, just as one would expect in CCD. So those findings seemed to support the notion that IAPV can cause CCD or at least contribute to the problem.

Additional sampling efforts by several groups showed, however, that IAPV was widespread in the U.S. and that not all infected colonies had symptoms of CCD, implying either that IAPV alone cannot cause the disease or that some bees are predisposed to be IAPV-resistant. In particular, a joint study the two of us initiated in 2007 with the USDA has tracked colonies owned by three traveling beekeepers and has observed colonies that were infected with IAPV without collapsing. Some of those colonies have later been able to rid themselves of the virus.

The growing consensus among researchers is that multiple factors such as poor nutrition and exposure to pesticides can interact to weaken colonies and make them susceptible to a virus-mediated collapse. In the case of our experiments in greenhouses, the stress of being confined to a relatively small space could have been enough to make colonies succumb to IAPV and die with CCD-like symptoms. More recent results from long-term monitoring have identified other unexpected factors for increased colony loss, including the fungicide chlorothalonil. Research is now focused on understanding how these factors relate to colony collapse.

A vaccine or cure for bee viruses and IAPV specifically would be desirable. Unfortunately, vaccines will not work on honeybees, because the invertebrate immune system does not generate the kind of protection against specific agents that vaccines induce in humans and other mammals. But researchers are beginning to pursue other approaches, such as one based on the new technique of RNA interference [*To see related sidebar please purchase the digital edition*], which blocks a virus from reproducing inside a bee's cells. A longer-term solution will be to identify and breed virus-resistant honeybees. Such an effort could take years, though, perhaps too many to avoid having a large number of beekeepers go out of business.

Meanwhile many beekeepers have had some success at preventing colony loss by redoubling their efforts at improving their colonies' diets, keeping infections and parasites such as varroa and nosema in check, and practicing good hygiene. In particular, research has shown that sterilizing old beehive frames with gamma rays before reusing them cuts down the risk of colony collapse. And simple changes in agricultural practices such as breaking up monocultures with hedgerows could help restore balance in honeybees' diets, while providing nourishment to wild pollinators as well.

Humankind needs to act quickly to ensure that the ancient pact between flowers and pollinators stays intact, to safeguard our food supply and to protect our environment for generations to come. These efforts will ensure that bees continue to provide pollination and that our diets remain rich in the fruits and vegetables we now take for granted.

Editor's Note: This story was originally published with the title "Saving the Honeybee"

—//\\—

Entomological Societies of Canada & Manitoba

ES C/M 2009

Winnipeg, 18-21 October

Fort Garry Hotel, Winnipeg, Manitoba

APICULTURE: BEE–VIRUS INTERACTIONS

Wednesday, October 21, 2009

8:10 **INTRODUCTION.** Rhéal Lafrenière, Manitoba Agriculture Food and Rural Initiatives, Winnipeg, Canada

8:15 **INHIBITION OF DEFORMED WING VIRUS (DWV) REPLICATION IN HONEY BEES BY RNA INTERFERENCE**. Suresh Desai and Dr. Robert Currie, Department of Entomology University of Manitoba, Winnipeg, Canada

8:45 **CURRENT STATE OF HONEY BEE VIRUS RESEARCH IN EUROPE.** Dr. Joachim Rodrigues de Miranda, Department of Entomology, Swedish University of Agricultural Sciences, Uppsala, Sweden

9:30 **ASSOCIATION OF CCD WITH IAPV: RNAI APPROACH TO CONTROL IAPV AND A POSSIBLE ROLE TO VIRAL INTEGRATION.** Dr. Ilan Sela, Virus Laboratory, Hebrew University of Jerusalem, Rehovot, Israel

10:15 COFFEE

10:30 UNRAVELLING THE PATHOGENS IN HONEY BEES UNDERGOING COLONY COLLAPSE DISORDER. Dr. Diana Cox-Foster, Department of Entomology, Pennsylvania State University, University Park, Pennsylvania, USA

11:15 RNAI AT WORK IN REAL LIFE APPLICATION: TARGETING INVERTEBRATE PESTS AND BENEFICIAL ORGANISMS' DISEASES. Eyal Ben-Chanoch, Beeologics, Miami, Florida, USA

11:45 VIRUSES AS BIOLOGICAL CONTROL AGENTS FOR INSECT PEST CONTROL. Dr. Martin Erlandson, Saskatoon Research Centre, Agriculture and Agri-Food Canada, Saskatoon, Saskatchewan, Canada

12:30 End of Session

$35 per person – Payment Mail to:
ESC-ESM Apiculture Symposium 204-545 University Crescent Winnipeg, Manitoba, CANADA R3T 5S6

APICULTURE SYMPOSIUM REGISTRATION FORM

Method of Payment ***Please Print***

Cheque (**PERFERRED FORM OF PAYMENT**) enclosed payable to: ESC/ESM

By Credit Card – Circle one: VISA MASTERCARD

Credit Card Number _____ Expiration Date _____ Signature _____

Please include a copy of the REGISTRATION FORM with your payment -- Thank you.

Red River Apiarists' Association
Winnipeg, Manitoba
2009 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)- $25.00.

Name _____ Tel. _____
Address _____
City _____Prov._____ Postal Code _____
E-mail address _____
Signature _____

New Member [ ] Renewal [ ] Student [ ] [free 1st year]

Other. Please specify._____

This completed form may be brought to the meeting or mailed with your cheque to :

John Speer, RRAA Treasurer
Box 16, Group 555. Winnipeg, Manitoba R2C 2Z2.

Make cheques payable to Red River Apiarists' Association.
Please do not send cash in the mail.