Red River Apiarists' Association

The Bee Cause

Volume 13, Issue 6 September 2016

Next general meeting is 7:30 Tuesday, 13 September 2016 at the **The Elmwood Legion 920 Nairn avenue , Winnipeg.**

Speaker: Hive environment - fall management; update of club's queen rearing sessions; spring and summer beekeeping results.

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Effects of Wintering Environment and Parasite–Pathogen Interactions on Honey Bee Colony Loss in North Temperate Regions Suresh D. Desai , Robert W. Currie Published: July 22, 2016 http://dx.doi.org/10.1371/journal.pone.0159615

Abstract

Extreme winter losses of honey bee colonies are a major threat to beekeeping but the combinations of factors underlying colony loss remain debatable. We monitored colonies in two environments (colonies wintered indoors or outdoors) and characterized the effects of two parasitic mites, seven viruses, and *Nosema* on honey bee colony mortality and population loss over winter. Samples were collected from two locations within hives in fall, mid-winter and spring of 2009/2010. Although fall parasite and pathogen loads were similar in outdoor and indoor-wintered colonies, the outdoor-wintered colonies had greater relative reductions in bee population score over winter. Seasonal patterns in deformed wing virus (DWV), black queen cell virus (BQCV), and *Nosema* level also differed with the wintering environment. DWV and *Nosema* levels decreased over winter for indoor-wintered colonies but BQCV did not. Both BQCV and *Nosema* concentration increased over winter in outdoor-wintered colonies. The mean abundance of *Varroa* decreased and concentration of Sacbrood virus (SBV), Kashmir bee virus (KBV), and Chronic bee paralysis virus (CBPV) increased over winter but seasonal patterns were not affected by wintering method. For most viruses, either entrance or brood area samples were reasonable predictors of colony virus load but there were significant season sample location interactions for *Nosema* and BQCV, indicating that care must be taken when selecting samples from a single location. For *Nosema* spp., the fall entrance samples were better predictors of future infestation levels than were fall brood area samples. For indoor-wintered colonies, Israeli acute paralysis virus IAPV concentration was negatively correlated with spring population size. For outdoor-wintered hives, spring *Varroa* abundance and DWV concentration were positively correlated with bee loss and negatively correlated with spring population size. Multivariate analyses for fall collected samples indicated higher DWV was associated with colony death as did high SBV for spring-collected samples.

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Presidents Comments for September, 2016

The RRAA wishes to thank Waldemar Damert for allowing the queen rearing classes to share an apiary site of his near Tyndal Manitoba and Howard Alexander for allowing the RRAA to use his sheep pasture for an apiary site in Stonewall.

The following is a note on the queen rearing course this June: in Tyndal and Stonewall. Styrofoam hive boxes were used with Christos Argiriou's nuc's in Stonewall and Waldemar Damert nuc's in Tyndal.


Jenter Kit

Queens did not cooperate in that they experienced delayed laying and laying only in the non plug cells at Tyndal during the initial 4 days in the

One queen was removed to another nuc colony and that colony used to raise queens.

However, excess queen cells / queens were produced being held in cages and allowed to hatch. Bees were collected for the mating nucs from bees on the cages and from the honey supers then smoked with a little tobacco smoke.

Once quieted from the smoke a ladle full of bees was added to each mating nuc then the queen was marked and released directly into the bees.

Each person received a mating nuc boxes The nuc boxes were checked over the next week or so then bees and queens were introduced to a regular 4, or 5 frame or regular brood boxes with 2 frames of brood from another strong colony.

3/4 size honey supers were used to give nucs workload and draw the new nurse bees up. These were used for mating nucs.

There are several techniques for queen rearing this is just one.

More will be discussed at the next meeting.

There is talk of another association queen rearing course next spring with an alternate method of nuc production. Raising queens then introducing the virgin hatched queen via a candied queen release cage into a nuc boxes with 2 frames of brood that has been allowed to be queenless for one night.

Come to the meeting September 13 and share your summer results, questions and entry for a chance at some great door prizes. —//\\—

Red River Apiarist's Association
Minutes of the Regular Meeting
May 10, 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 April 12, 2016 be accepted
Moved: John Badiuk
Seconded: Charles Polcyn
Carried

MBA Report
A petition is being circulated concerning the practice of mixing Canadian honey with imported honey. It is important to read the fine print on the honey containers. There is talk of changing labeling to have the country of origin on the front of the container. A change in the insurance for beekeepers is coming. $1200.00 has been given to U of Manitoba for research. The AGM of the MBA will be kept in Winnipeg and must be held in February. A fee increase was supported for the tech team. Ontario is giving some help to beekeepers with a business plan. The average price of bulk honey was $1.79/lb and $3.50 is the recommended price for 2016.

President's Report
Waldemar reported he noticed pollen being carried to the hives on April 18 but no new brood we noticed after the recent cold snap. He commented that in a bee yard the NW hives are often the weakest in the spring and one should not try to equalize hive strength at this time. Some information gained from conversations with US beekeepers; 150,00 hives in one operation with 2200 hives in one yard alone. A mobile extraction unit is used to collect honey from the yards. Lots of bees flying around and can bees can empty a hive of honey in seven minutes. Queens are so overstressed they only last one year. They are transported to as many as 5 or 6 crop rotations in one year. Honey is a by-product for these pollination units that receive $200.00/hive.
Coop is apparently sold out of bees but can order more in. some came with mites (lice) on them. It is rumored that Alberta and the Dauphin area had a lot of winter losses and beetles are being blamed for this.

Bee Yards
Both bee yards appear to be a go although some meetings are still needed with the zoo. Setting up will begin the end of the month so members who have volunteered should be prepared to help when asked.

Bee Day
June 4 will be bee day at the Forks. It is an excellent opportunity for us to educate the public about bees. It takes coordination and volunteers are necessary. John Badiuk will be preparing a press release and a pamphlet will be available for handout. John Speer is organizing the necessary liability insurance. Waldemar will provide an observation hive and Ken and Duane will provide information to members.

Guest Speaker
Dr Suresh Desai presented the results of his research on the effects of pathogens on honeybees and the control of viruses using new molecular techniques. There are more than 24 viruses that affect honeybees. He studied viruses in healthy and unhealthy hives and found little difference in viruses between the two. He also looked at the differences between indoor and outdoor wintering methods. For indoor wintering the deformed wing virus decreased from fall to spring while for outdoor wintering it increased from fall to spring. Ways to control viruses are: control varroa mites, have better bee genetics (better queens), use antiviral drugs and use RNA interference. Certain viruses can be controlled by RNAi techniques. Large companies (Bee Logic, Monsanto) are developing RNAi techniques for virus control. Take home messages: viruses are opportunistic so stay on top of varroa mites. Varroa mites are a problem for bees on there own but the combination of mites and the viruses they carry are especially bad.

Other reports
Charles Polycyn reported that he still had some equipment for sale.

Loonie Draw
A large number of lily tubers were the prizes for the loonie draw and many members went home with some.

Next Meeting
The next meeting will be on September 13, 2016.

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Red River Apiarists' Association – Executive Meeting

Peppercorn Restaurant in Oakbank MB.– August 27, 2016

Present at the meeting: Waldemar Damert, John Speer, Ken Rowes, John Russell, Duane Versluis, Alex Remkes, Armand St. Hilaire, Margaret Smith, Art Quanbury (recorder)

Bee Yard/s and Urban Beekeeping
It should be possible to have a bee yard at the conservatory next year. There are 8 colonies and equipment at the Stonewall site that need to be tended to this fall. Urban beekeeping should be allowed city wide soon. Regulations' will likely allow 2 colonies per property. Urban beekeeping will increase as a result and the inexperienced beekeepers will need help. RRAA should prepare and position itself to provide the needed assistance. RRAA should have a swarm removal service in place for next year.

Honey show
The Honey Show will be held at the Forks on Saturday September 24 and Sunday the 25th this year. We need to convince the

Forks that this event is an educational one in order not to pay a fee. The forks cannot guarantee the same location as previous years. The location may be in the Atrium, a room near the elevators. There is access from the halls. Four tables and chairs will be provided at a charge of $15.00 (each??, or total). Six tables will be needed so arrangements will be made for two additional ones. Waldemar will bring his observation hive. Insurance has been confirmed. Judges have been confirmed. Rules for the show will be in the next Newsletter. Vendors have been confirmed. A volunteer sheet will be distributed at the next meeting. Four cases of jars will be brought to the meeting for distribution. A floor plan will be set up of the display and vendor area; vendors at front, display at back. Prize ribbons at the trophy place on Marion St. in St. Boniface. Ribbons have been ordered and paid both for 2016 and 2017. Ken will talk to the members about rules and deadline at next meeting and will communicate with Rhéal, another judge. A sign will be placed in the Bee Maid store about the competition. The event will take place from 9:00 am to 6:00 pm on both days. Armand will be thee at 8:00 am on Saturday for set up. John Badiuk will prepare a press release. A discussion of a theme followed. It should be educational; "Taste the difference". Have a number of different urban honeys available for tasting. Stress: "Local is good". Four samples maximum. Have at back of the display area.

Club Honey and Bees

The club has several 100 pounds of honey to sell. Ken will extract it and put it in 50 lb pails. It will be offered for sale to club members at not less than $2.00/lb. John B. has club bees and will prepare them for winter. They could be stored at Waldemar's over the winter.

General Meeting Topics

September topics will include swarming, life environment and fall management.

The October meeting could try a different meeting format. During the meeting there will be a question period and then a breakout into smaller groups with a facilitator for 10-15 minutes returning to the group with answers to a specific question.

November is a social evening with a show and tell session, announcement of January election of executive.

No meeting well be in December.

Other Business

A discussion about ads concluded that ads were free for members in the Newsletter but there was a $10.00 charge for non-members through the treasurer John Speer. A request was made to have bylaws distributed to all executive. Duane will send them out. Duane and Art will review bylaws to see if updating is needed and will bring results to a future meeting.

The club should purchase a video projector. Duane will obtain prices on three units fitting our clubs needs for discussion at next meet . Marg has a screen that she will bring to the next meeting.

A discussion was held on using forms of social media (Facebook/ Twitter) to communicate with members who use these media. A person familiar with these forms will be recruited at the next meeting to organize this.

Queen mating boxes should be cleaned up and brought to the next meeting. Duane will send an email to members about this.

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MBA Report April 2016
Margaret Smith, RRAA MBA Representative

THE FLOW HIVE

A novelty in the last year or so a flow hive that John Badiuk was willing to test for a client was established while conducting our queen rearing course in Stonewall.

Once the colony was established for a week or so expansion space was needed. You can see that the hive is smaller than the regular Langstroth hive and to provide space for bees a 3/4 honey super was adjusted to fit without having the hive open by attaching a 1/16th slip board nailed to one side top and bottom.

It was very Interesting to observe that the bees tended to work the Langstroth box over the plastic split comb frames. As the colony grew a second box was applied and the bees moved honey up into the second 3/4 box. At this point honey was to be Removed and to shift the bees to load the flow frames the two 3/4 frames were removed and placed on the Nuc #4 closest to the flow hive. Within the week the flow frames were filled and the first test of flow was very successful. No quantity evaluation was done however the moisture content was 16.7%.

Photos and videos were taken which are logged on an open web site. More information at the next Association meeting. Flow was slow as expected and collection bucket needed to be tightly sealed from robbing bees.

The flow hive has proven itself to function . On the bigger scale it might prove limiting. Once all the honey was drawn and the colony prepared for winter management the upper flow frame box was left for the bees to clean reducing the crystallization between the plastic frames. At this time this was the state of press test will be in whether the the hive so the an adequate job of cleaning bees performed and whether propolization has further stuck the frames together making further inspection and clean problematic.

The RRAA would like to thank John and his sponsor for the summer added educational sideline on a cutting edge of new beekeeping technology.

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(from pg 1)
Introduction

The beekeeping and pollination industries worldwide are greatly affected by the recent challenges to managed honey bee (*Apis mellifera* L.) colonies resulting winter losses of honey bee colonies often averaging 30–40% in the U.S., Canada and Europe. These losses are generally believed to result from interactions with multiple stressors that include parasitic mites, pathogens (viruses, bacteria, and microsporidia parasitic fungi), poor queen quality, low genetic diversity, pesticides and other environmental factors.

Honey bee viruses are wide spread in Canada and some, such as deformed wing virus (DWV) and black queen cell virus (BQCV), are present in most colonies–often at high concentrations. However, the roles that bee viruses and their interactions with other parasites, pathogens and environmental stressors play in contributing to winter colony losses are unclear. It is important to determine which of these pathogens, or groups of parasites and pathogens, has the greatest impact on winter mortality of honey bee colonies, under different wintering management (indoor and outdoor wintering) conditions. This information would assist in the development of effective management strategies.

The ectoparasitic mite, *Varroa destructor* Anderson and Trueman causes winter loss of colonies when mite levels are greater than 10% in late fall and is a significant cause of winter losses of honey bee colonies in the northern hemisphere. *Varroa* can have synergistic interactions with other parasites such as the tracheal mite, *Acarapis woodi* (Rennie), resulting in high winter loss even with low levels of *Varroa* present. Multiple infestations of honey bee colonies with a variety of microbes might also play a role in winter colony mortality. Viruses directly play a role in affecting bee colony population loss that is equivalent to, or larger than, direct *Varroa* feeding damage. However, little is known about interactional effects between *Varroa* and pathogens of honey bees or how beekeepers can manage colonies to decrease the impact of such interactions in overwintering colonies. Three viruses in particular, (DWV, Israeli acute paralysis virus (IAPV) and acute bee paralysis virus (ABPV)) have been linked with large scale overwinter losses. ABPV is suspected to be involved in colony losses in Europe but its role in colony loss in North America is less clear. Other viruses of importance include KBV, BQCV, SBV, and CBPV. Links between KBV and colony loss occur. For example, prevalence of KBV in CCD colonies is greater than in non-CCD colonies. BQCV is closely associated with the microsporidian *Nosema apis* Z. and may work in concert with it to affect honey bee health but it is not thought to be a major factor in colony collapse in some areas of Europe. CBPV and SBV were the second most prevalent viruses identified in a study conducted in Belgium but neither were correlated with colony mortality. **(continued on pg 7)**

Disease and pest control product disposal program – CleanFarms

Collection Cites:

Monday , October 24th

Swan River Richardson Pioneer 204-238-4237
Arborg Crop Production Services 204-376-5990
Brandon Acropolis Warehousing Ltd. 204-729-8554

Tuesday, October 25th

Dauphin Dauphin Co-op 204-622-6080
Marquette Marquette Consumers Co-operative Ltd. 204-375-6570
Virden Redfern Farm Services Limited 204-748-122
Altona GJ Chemical Company Ltd 204-324-8090

Wednesday, October 26th

Inglis Jackson Seeds Limited 204-564-2293
Beausejour Crop Production Services 204-268-3497
Deloraine Crop Production Services 204-747-2877
Arnaud GJ Chemical Company Ltd. 204-427-2337

Thursday, October 17th

Shoal Lake Richardson Pioneer 204-759-2917
Steinbach Richardson Pioneer 204-326-4483
Starbuck Bestland Air Limited 204-876-4557
Snowflake Double Diamond Farm Supply 204-876-4557

Friday, October 28th

Gladstone Crop Production Services 204-268-3497
Niverville Patterson Grain 204-388-6565
Holland Patterson Grain 204-526-2240
Portage La Prairie Portage Co-op 204-637-3030

What products will be accepted?

- Obsolete or unwanted agricultural pesticides (identified with a Pest Control Product number on the label).
- Livestock medications that are used by primary producers in the rearing of animals in an agricultural context (identified with a DIN number, Ser. Number or Pest Control Product number on the label).
- If you are unsure whether your product fits the scope of this collection please call us at 1-877-622-4460 ext. 2223.Salut!

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Red River Apiarists' Association

Editor's Note & musings by Ken Rowes

Bees have not been working well this summer in all areas with some well below average honey production. With that there is declines in the world honey price (I have herd $1.20 / lbs), to which some commercial producers are forced to store for higher prices.

September it is and treatments must be started to achieve affective measures within the next mouth or two. So some may be scrambling to get the last of the honey off and spun out.

September is also the Manitoba Honey show month, a chance to show case our apiculture agri-business with a local flavour. This year with a theme of "Local is Best" with a slant to an encouragement to buying locally and additionally raw honey.

The competitive honey aspect is more for local beekeepers to educate public interested to the different honeys and quality of the beekeeping practice. It is for the beginner and the seasoned beekeeper to show case among themselves their passion in the honeys, the bees wax and the public interest for the Manitoba community is aware and interested. Every year the fun of having your honey on display is part of your beekeeping legacy. Take one up and be apart of it!

If you are wanting or selling please consider the RRAA Classifieds, Mail in ads to the editor—non-members $10 through the treasure John Speer.

CLASSIFIEDS

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

2 For Sale: New inner covers 7/8" x 7/8", pine rimmed with 3/8" solid plywood. $10.75 each
Contact Ted Scheuneman: 204-338-6066

3. 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.

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

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.

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

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

6. For Sale: Four frame nucs after mid May; contact **Chris Argiriou at 204-296-4848 or e-mail christos-a@shaw.ca**

7. For Sale: Four frame nucs with young local queens. Queens available in July contact**: Waldemar Ph 204-755-2340 or Email: wdamert@yahoo.ca**

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(from pg 5) One of the biggest challenges of studying virus pathogenesis in honey bees is linking infection by an individual virus to a particular set of economic impacts or disease symptoms. In field studies, honey bees are often infected by multiple viruses simultaneously, most of which usually persist as latent infections in the bee hosts. In addition, virus infections in honey bees are often associated with non-viral pathogens and other parasites. Therefore, without the application of Koch's postulates, it is difficult to prove that specific symptoms are indeed caused by a particular virus and not the result of mixed virus infections particularly when viral loads in bees cannot be determined. Virus prevalence information is not adequate to predict colony loss so quantification of virus loads using sequence-based methods is essential to developing estimates of the potential impacts of individual viruses on infected bees. Information as to how and when samples should be collected in order to best predict the disease impact of viruses is also required.

The other groups of parasites associated with colony losses in temperate countries are the microsporidian fungi, *N. apis* and *N. ceranae* (mentioned previously). Nosema has long been known as an economically important and commonly encountered disease. *Nosema ceranae* is associated with reduced honey production and increased winter mortality. A nominal treatment threshold of 1 million spores per bee is recommended in Canada, but this estimate was based upon *N. apis* and good thresholds do not exist for *N. ceranae*.

The level of *Nosema* is typically higher in foragers or old worker bees than newly emerged bees and house bees suggesting older workers may be better indicators of future disease impacts. Methods of sampling for *Nosema* may need to be refined to better predict its impacts and to develop thresholds for this organism. Similar issues related to sampling of bees need to be addressed with respect to both viruses and *Varroa*. Thus, studies on the best location in the hive for collecting samples for these groups of parasites and pathogens are required. Long term monitoring of indoor and outdoor-wintered colonies prior to symptoms of collapse is required to help identify the pathogens associated with colony losses.

Little is known about the effects of the winter environment on virus interactions. This can be examined in Canada where there are two primary types of wintering methods adopted by the beekeepers. Honey bee colonies can be wintered indoors in an environmentally controlled building, or outdoors, protected by insulation. For indoor-wintering, honey bee colonies are stored in a building under complete darkness where temperatures are maintained at about 2°C– 5°C. Beekeepers may over winter honey bee colonies in a single brood chamber or multiple brood chambers. In indoor-wintering method, a majority of beekeepers in western Canada winter bee colonies in single brood-chamber hives whereas for outdoor wintering, the majority winter bee colonies in double brood chamber hives. Differences in susceptibility to *Varroa*, combinations of *Varroa* and tracheal mite and possibly *Nosema* may occur in colonies wintered indoors and those wintered outdoors and susceptibility to viruses may be similarly affected.

The overall purpose of this study was first, to understand the seasonal dynamics and relative importance of parasites and pathogens on winter mortality under indoor and outdoor-wintering management systems and second, to determine if practical sampling methods can be developed to help predict their impact on colony survival over winter. The outcome of this study may help beekeepers, to understand the dynamics of disease and pathogen interactions and thus reduce winter mortality of honey bee colonies or optimize the management of parasites. We show that winter environment affects the dynamics of interactions between parasites, pathogens and colony population losses, and that sample location within the hive can affect interpretation of pathogen load results for some but not all pathogens.

Apiary and colony selection

Honey bee colonies were sampled from five different beekeeping regions in the Province of Manitoba, Canada (Eastern, Southwest, Northwest, Interlake, and Central). Prior permission was obtained from 25 beekeepers to collect samples from their bee yards. The distance between beekeepers was in the range of 30km to 150km within the same region. Five beekeepers that wintered bees using either an outdoor or indoor wintering management system were randomly selected from each region (except for regions in which beekeepers used only one wintering method). For each beekeeper, three colonies were randomly selected from a single apiary site for inclusion in the study. Fifteen of these beekeepers practiced indoor wintering, and 10 of them practiced outdoor wintering. Hence, 45 colonies were wintered using indoor-wintering buildings (33 in single chamber standard Langstroth hives containing 9–10 Hoffman frames and 12 in double chamber hives) (here after referred to as "indoor-wintered") and 30 colonies were wintered outdoors (9 in single chamber and 21 in double chamber hives) (here after referred to as "outdoor-wintered"). Beekeepers were asked to follow their usual apicultural management techniques for controlling parasites, wintering and managing colonies. In fall, 14 of 15 producers that wintered indoors and 9 of 10 producers that wintered outdoors treated bees to control *Varroa*. Acaricides used were amitraz (Apivar ®) (11 producers), formic acid (various formulations) (10 producers), oxalic acid (2 producers), and coumaphos (1 producer). In fall, 11 of 15 producers that wintered indoors and 4 of 10 producers that wintered outdoors treated bees with fumagillin to control *Nosema*.

Seasonal *Nosema* correlations

Mean abundance of *Nosema* from each **(continued on pg 8)**

(from pg 7)

of the two sample locations within the hive (brood area or entrance) in fall was correlated with levels in colonies in mid-winter and spring and with each other to assess which sample location would result in a better prediction of future *Nosema* levels. There was a weak, but positive correlation between fall *Nosema* level of entrance-collected bees and fall *Nosema* level of brood area-collected bees. However, fall entrance samples were better predictors of mid-winter *Nosema* levels than brood area samples. Fall entrance and brood area *Nosema* levels both showed weak negative correlations with spring *Nosema* spore levels, but fall brood area samples were marginally better at predicting spring brood area levels than were the fall entrance-collected samples. Mid-winter *Nosema* levels were highly correlated with the spring brood area samples but only weakly correlated with spring entrance samples. Interestingly, neither fall entrance-collected nor brood area-collected *Nosema* levels were correlated with spring entrance-collected levels.

Effect of fumagillin treatment

Fall fumagillin treatment suppressed *Nosema* for indoor-wintered colonies with workers from colonies treated with fumagillin having lower mean abundance of Nosema (2.34 ± 0.91 SE million spores per bee) than untreated ones (8.24 ± 1.50 million spores per bee). Numerically, outdoor wintered, colonies showed a similar trend with lower spore counts in colonies treated with fumagillin (1.62 ± 2.31 million spores), than untreated colonies (8.86 ± 1.94 million spores), but the difference in suppression was not significant.

Results

Change in colony size over winter

The relative change in bee population size from fall to spring was affected by wintering method as indicated by a significant wintering method *season interaction. Over the winter, the outdoor-wintered colonies suffered significantly higher bee population loss (55%) than indoor-wintered ones (42%). In fall, outdoor-wintered colonies had higher populations than indoor-wintered colonies but by spring colony populations for outdoor-wintered colonies and indoor were similar. Overall, winter colony mortality (colonies that were dead after removal of winter wraps in spring) was 20% and did not differ with wintering method.

Prevalence of honey bee pathogens and parasites

There was a significant interaction between season*pathogen—parasite therefore separate analyses were performed on each pathogen and parasites. Prevalence of parasites and pathogens was similar in each wintering method. *Varroa* were detected in 56–83% of colonies, but there was no difference in proportion of colonies with detectable mites among wintering methods and among season. The honey bee tracheal mite was found in a low percentage of colonies (3% to 10%) and prevalence also did not vary with wintering method or by season. *Nosema* spore prevalence increased from fall to spring seasons and within indoor-wintered colonies *Nosema* prevalence was higher in mid-winter than fall but remained at similar prevalence between mid-winter and spring.

DWV and BQCV had the highest prevalence and were detected at similar frequencies in indoor and outdoor-wintered colonies. Their prevalence did not change over winter. Over both wintering methods, SBV prevalence increased from fall to spring and for indoor-wintered colonies (also sampled in mid-winter) prevalence increased from fall to mid-winter but remained at similar prevalence from mid-winter to spring. IAPV and KBV prevalence both increased over winter when averaged over both wintering methods but did not increase in prevalence from fall to mid-winter for indoor wintered colonies. CBPV and ABPV were detected in a comparatively low proportion of colonies and prevalence remained low the following spring.

Varroa mean abundance (mites per 100 bees) was higher in fall than spring, but did not show any interactions with wintering method or sample location. Although, overall *Varroa* levels were low, mean abundance in individual hives ranged from 0 to 52.6% for indoor-wintered hives and 0 to 24.4% for outdoor wintered hives. In spring, *Varroa* ranged from 0 to 9.8% for indoor-wintered hives and 0 to 13.1% for outdoor wintered hives. The concentration of SBV, KBV, and CBPV also changed with season, the seasonal patterns for each of these viruses were lower in fall and increased in spring, but seasonal patterns for these viruses did not vary with wintering method or sample location

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Seasonal *Nosema* correlations

Mean abundance of *Nosema* from each of the two sample locations within the hive (brood area or entrance) in fall was correlated with levels in colonies in mid-winter and spring and with each other to assess which sample location would result in a better prediction of future *Nosema* levels. There was a weak, but positive correlation between fall *Nosema* level of entrance-collected bees and fall *Nosema* level of brood area-collected bees. However, fall entrance samples were better predictors of mid-winter *Nosema* levels than brood area samples. Fall entrance and brood area *Nosema* levels both showed weak negative correlations with spring *Nosema* spore levels, but fall brood area samples were marginally better at predicting spring brood area levels than were the fall entrance-collected samples. Mid-winter *Nosema* levels were highly correlated with the spring brood area samples but only weakly correlated with **(cnt'd pg 9)**

(from pg 8) spring entrance samples. Interestingly, neither fall entrance-collected nor brood area-collected *Nosema* levels were correlated with spring entrance-collected levels.

Discussion

In this study we compared beekeeper-managed colonies across a broad geographic scale in two distinct environments: a "mild" stable environment (for colonies wintered indoors) and a "harsh" fluctuating environment (for colonies wintered outdoors). We sampled adult bees from each colony before (two locations), during (one location for indoor-wintered colonies only), and after (two locations) winter to characterize the effects of two parasitic mites, seven RNA viruses, and *Nosema* on honey bee colony mortality and population loss over winter. The results showed that outdoor-wintered colonies had greater relative reductions in bee population scores over winter than indoor-wintered colonies despite having a similar composition and level of parasites and pathogens prior to winter. Two viruses (DWV and BQCV) and one pathogen (*Nosema*) showed different seasonal patterns in indoor and outdoor-wintered colonies. Combinations of parasite and pathogen variables that were correlated with bee loss or spring size and each other also differed in the two wintering systems. Sample location affected assessment of *Nosema* and BQCV levels but did not affect assessment of other parasites or pathogens and this has implications for sampling to predict impacts of pathogens on colony loss.

Since 2006, honey bee winter colony losses in Canada have often exceeded 29% of the national total and have been at levels equivalent to levels of colony losses found in the U.S. and Europe. In this broad scale study, overall death of colonies wintered in different environments was similar (20% loss) but the change in bee population score over winter was significantly greater in the outdoor-wintered colonies than in the indoor-wintered colonies. This was not likely a result of beekeeper management designed to achieve a specific spring population size. In northern regions, beekeepers often winter larger colonies (double brood chambers) outdoors and smaller colonies (single brood chamber) indoors as occurred in this study. Thus, the larger fall populations found in outdoor-wintered colonies were expected. However, under this type of management, spring populations in healthy double brood chamber colonies would typically consist of 16,000–25,000 bees, whereas single brood chamber colonies would have lower populations (7,800–10,000 bees). This did not occur in this study where spring population size of the outdoor-wintered hives (mostly double brood chamber) and indoor-wintered hives (mostly single brood chamber) were similar.

The prevalence and concentrations of the suite of parasites and pathogens analyzed in this study were similar for the indoor and outdoor-wintered colonies prior to implementation of wintering management. No single parasite or pathogen was highly correlated with winter bee loss in either of the two wintering methods in our study. However, the interactions between parasites, pathogens, colony loss and spring population size were very different in each of the two wintering environments. Thus, the environment to which colonies were exposed, in combination with management practices of beekeepers, likely played a role in affecting the different interactions between parasites and pathogens that were observed. Indoor-wintered colonies were maintained in a comparatively mild, stable environment (5°C) under total darkness for the entire winter period (November to March). In contrast, colonies wintered outdoors in our study were exposed to temperatures that ranged from -33°C to 17°C and would have been exposed to daily (or periodical) temperature fluctuations of up to 23°C. Little is known about how environmental stressors interact with pathogen and parasite webs in honey bees at the colony level. Lab studies have shown that comparatively small variations in brood nest temperature (shifts from 30 to 33°) can influence the severity of viruses in developing bees. Field studies have shown that wintering honey bees in the more stable environments within wintering buildings allows colonies to survive winter under higher infestation levels of *Varroa*, either alone or in various combinations with tracheal mite and *Nosema* or other stressors. However, before this work, interactions with viruses in different wintering environments have not been examined.

In this study, most beekeepers (23 of 25) treated colonies for *Varroa*. Overall, the average *Varroa* levels in late fall were well below the fall economic threshold for *Varroa* of > 3% in early fall and >10% in late fall that can result in significant winter colony mortality in this region of Canada. It is likely some samples were taken before residual effects of the acaricide treatments brought mite levels fully under control as *Varroa* levels decreased further before spring. However, despite the acaricide treatments, there were still a few colonies that were detected at the time of fall sampling that were well above treatment thresholds in both indoor and outdoor treatment groups. The mites in these colonies may have escaped treatment due to acaricide resistance, which is common in Canada or may have immigrated to colonies through drifting or robbing bees. It should also be noted that some colonies could have been above the threshold prior to fall sampling but had low mite levels when samples were collected and processed for parasites and pathogens as a result of prior acaricide treatment. The extent to which this might have occurred could not be quantified, as beekeepers did not know their mite levels prior to treatment.

Varroa on its own has major impacts on colony survival. *Varroa* feeding activity directly affects adult worker bees by removing their hemolymph and depleting protein and lipid reserves, which shortens their life span. Despite the relatively low mite levels in our study, there was a positive correlation between *Varroa* mean abundance and **(cont'd pg 10)**

(from pg 9) bee loss and negative correlation between *Varroa* mean abundance and spring population size for outdoor-wintered hives (when sampled in spring). Others have found high rates of winter bee loss caused by *Varroa*, but usually in association with much higher mite levels (>10 mites per 100 bees). *Varroa* and honey bee tracheal mites are also known to interact synergistically in enhancing bee losses, but tracheal mites did not have a significant effect on bee loss in this study.

It is not known if the dynamics of *Varroa* feeding and its role as a vector and activator of viruses would be substantially different in clusters of bees wintered indoors and those wintered outdoors. It is likely that lower levels of environmental "stress" associated with indoor wintering may have contributed to the different patterns that were observed. *Varroa* mites are effective vectors of many viruses and play a major role in activating DWV, KBV, ABPV, IAPV, SBV, and CBPV to pathogenic levels in honey bees. *Varroa* weaken the bee's immune systems, making them more susceptible to viruses, and act as effective vectors to spread viruses within colonies. *Varroa* and DWV together affect storage lipoproteins (vitellogenin) necessary for winter survival and affect immune system function. DWV alone could also be damaging DWV replicates in various tissues such as the fat body and can replicate in immature and adult bees and increase bee mortality even in the absence of *Varroa*. Of the viruses tested, only DWV was associated with bee loss and low spring population size. We did not find any other direct correlations between *Varroa* and other viruses, which are often linked to poor bee health in different regions.

Varroa was correlated with DWV for fall samples in outdoor-wintered colonies. The high *Varroa* populations that were in some of our colonies would likely increase the chance of transmission of DWV and increase the susceptibility of bees to the virus. Others have shown that viruses such as DWV can remain at high levels even after *Varroa* has been removed by acaricide treatment. These interactions with viruses are now thought to be a major factor associated with colony loss. This is also likely to have occurred in our study to some extent as the most of mites were controlled by acaricide treatments but could have been at high levels prior to treatment.

Reductions in DWV from fall to spring in indoor-wintered hives may have been the result of either lower *Varroa* levels found in spring than in fall, highly infected bees dying and being removed from the colony over winter or possibly the result of population turnover in the colonies through brood rearing during in indoor-wintering during winter and early spring. The outdoor wintering environment seemed to favour "maintenance" of DWV. Possibly interactions with *Nosema* or other viruses played a role in facilitating DWV maintenance in outdoor-wintered colonies. Reductions in *Varroa* from fall to spring were not likely involved since *Varroa* was also lower in spring than in fall, during indoor-wintering where virus concentration declined over winter. Perhaps greater stress associated with the outdoor wintering environment suppressed immune responses in the bees. It is also possible that the acaricides used by beekeepers to control *Varroa* levels influenced DWV replication; however, the same types of acaricides were applied in both environments.

Spring DWV concentration was associated with winter bee loss and low spring population size for outdoor wintering thereby building upon the growing evidence implicating DWV as a cause of colony losses in many environmental and bee- management contexts. Although DWV appeared to affect bee loss in combination with *Varroa*, it also was correlated with other pathogens. For outdoor-wintered colonies in spring, DWV was positively correlated with KBV and CBPV. It is possible DWV may make bees more susceptible to other virus infections; however, this requires further study.

Environmental influences may have also affected links between IAPV and bee loss as we saw no link with IAPV and bee loss-related parameters in outdoor-wintered hives. Colonies in the outdoor-wintering environment may have succumbed to the presence of other stressors before IAPV could exert any effects on mortality.

We found low prevalence (up to 16%) of ABPV in colonies, very low concentrations relative to other viruses and no association with *Varroa* in our study. ABPV concentrations did not change from fall to spring.

Sac brood virus is generally thought of as a disease of immature bees (brood), and typically occurs at low levels in spring, peaks in mid-summer and declines in fall following natural brood cycles. In adult bees, the virus is also at lower levels in fall but little is known about the seasonal dynamics of this virus over winter. In our study, SBV prevalence increased dramatically from fall to spring and was also very high in colonies sampled in mid-winter even though little brood would be present in colonies at that time. SBV concentrations also were higher in spring than in fall. Sac brood was the only virus strongly associated with colony death and was also the only virus that had higher prevalence in unhealthy colonies from Manitoba than in healthy colonies across Canada. It is not known if SBV plays a direct role in colony death or if it is an opportunistic pathogen that is favoured when colonies are succumbing to other stresses. However, SBV was not correlated with any other parasites or pathogens linked to bee losses. Cornman et al found SBV is correlated with IAPV but only in colonies not expressing symptoms of CCD. Although IAPV was linked to low spring populations for indoor-wintered colonies in our studies, we did not see any correlations between SBV and IAPV. In indoor-wintering environments, fall SBV concentrations were correlated with **(cont'd on pg 11)**

(from pg 10) KBV levels, but Cornman did not find an association between SBV and KBV.He also found that in non-CCD colonies with *Nosema*, SBV is correlated with ABPV and CBPV, but we did not find any relationship between SBV and any of the pathogens.

Our study showed that *Nosema* mean abundance increased over winter for outdoor-wintered hives and decreased over winter for indoor-wintered hives. Fall treatments of *Nosema* with fumagillin were carried out in all of their colonies. In our study, 11 of 15 producers that wintered indoor, and 4 of 10 producers that wintered outdoors treated with fumagillin in fall for control of *Nosema*. For producers using indoor-wintering environments, those fall treatments resulted in lower spring *Nosema* spore counts than in producers that did not treat hives. However, in producers with outdoor-wintered hives spring *Nosema* spore counts did not significantly differ between those who treated with fumagillin and those that did not. This suggest that observed differences in the seasonal pattern of *Nosema* spore abundance for the two wintering environments may have been partly the results of differences in the residual efficacy of fumagillin in the two environments or a greater capacity for *Nosema* spores to replicate in colonies that are wintered outdoors compared to those wintered indoor.

Since *Nosema* suppresses the immune system in workers, the higher levels of DWV that were observed in spring outdoor-wintered hives could be related to inability to effectively control *Nosema* in outdoor wintered hives. Although it should be noted that *Varroa* is also correlated with DWV, *Varroa* may also be a factor affecting DWV concentration, this needs further study. *Nosema ceranae* also causes severe damage to the mid-gut epithelial cell. Mid-gut damage might facilitate exchange of viral pathogens across the gut wall and into the haemolymph but antagonistic interactions may also occur. Environmental influences could explain some of the differences as other studies did not have their colonies exposed to long periods of confinement or "harsh" wintering conditions.

Of the seven viruses, parasites and pathogens tested, sampling location affected mean abundance estimates of only *Nosema* and BQCV.

In conclusion, our study showed that colonies under similar initial parasite and pathogen loads experience lower rates of bee loss in indoor-wintering management than in outdoor-wintering management. This suggests producers should consider the use of indoor wintering as a management tool to reduce winter loss when. We showed that parasite and pathogen interactions and seasonal changes in mean abundance differed in the two different wintering environments. Fall IAPV level was negatively correlated with spring population but only for indoor wintered colonies. Spring *Varroa* and DWV levels were positively correlated with bee loss and negatively correlated with spring population but only for outdoor-wintered hives. SBV was the only virus significantly associated with colony death over winter for both wintering methods. Sampling location in the hive needs to be considered when interpreting the pathogen load of colonies for *Nosema* and BQCV and for estimating their impact on colony populations. For these pathogens, the best location for sampling differs between pathogens and seasons. Further experiments are urgently required to better predict bee population losses that result from the interaction of honey bee viruses and to develop management practices that will reduce their impact on colonies.

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Elephants and Bees - 2014

from: "Save the Elephants" project

Dr. Lucy King , P.O. Box 54667,
Nairobi, 00200, Kenya

Three small farm communities in Nairobi, Kenya have adopted a novel way to: reduce elephant invasive raids that cause trauma and injury to family members; increased yield production through reduced damage even honey yields; additional income through sale of 'elephant friendly honey and other bee products'; increased quality of life with greater income and less life-threatening HEC conflicts situations with elephants. Bee Hives or dummy hives are hung every 10 meters and linked together so that should an elephant touch one of the hives interconnecting wire along the fence swing and release the bees.

In essence the elephants do not like the bee stings on their trunks and try to avoid them.

Having had 80% success rate they continue using the bar hive and the Langstroth hive which swing efficiently in the fence.

Indirectly the project supports an increased honey bee population into farming areas which are mostly experiencing human expansion and development. Often such expansion includes negative activities such as overgrazing, land clearance and charcoal burning. Additional bee pollinators in such areas should help to increase pollination rates of natural vegetation such as trees, brush, flowering plants and wild grasses. This not only increases quality forage for livestock but also maintains a carbon sink for storing atmospheric carbon. Additionally farmers might begin to see beekeeping as a more sustainable and financially visible alternative to charcoal burning.

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MANITOBA HONEY SHOW

COMPETITION CLASSES

CLASS 1

1. Liquid Honey, White, totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars.

2. Liquid Honey, Amber, totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars.

3. Liquid Honey, Dark, totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars.

4. Liquid Honey, BEE-GINNER, any colour, totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars. (NOTE: ONLY OPEN TO FIRST-TIME HONEY SHOW ENTRANT).

5. Granulated Honey, White, totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars.

CLASS 2

1. Chunk Honey - totaling not less than 3 - 500 g (375 ml) glass or clear plastic jars, each containing one or more pieces of comb honey and the jars filled with liquid white honey.

2. Comb Honey - totaling not less than 3 pieces of either comb honey in plastic rounds or cut comb honey in individual containers.

3. Frame of Honey - one completely capped frame of white honey.

4. Beeswax - 2 kg in one cake or not more than 5 cakes.

CLASS 3

1. Best Taste - any color - totaling not less than 3 - 500 g (375 ml) glass or clear plastic containers. (Entries will be judged primarily for flavour and taste using simplified judging standards)

2. Honey Beverage – any type, colour or flavour – single container not larger than 1 litre.

3. Photography – one unframed 8" x 10" photograph depicting a) Honey Bee Pollination, b) Beekeeping in Manitoba, c) Other Bees and Insects, and/or d) Honey - In Many Forms. (If not previously submitted, Photos to arrive at Honey Show Display area by noon on Friday, the first day of show.)

CHAMPION EXHIBITOR: The exhibitor winning the greatest number of points in the Honey Division (Classes 1 and 2) will be declared the CHAMPION EXHIBITOR of the Manitoba Honey Show. Points are awarded, only if category has more than one entry, as follows:

PRIZE POINTS	
FIRST	3
SECOND	2
THIRD	1

MANITOBA HONEY SHOW

SEPTEMBER 24-25, 2016
THE FORKS MARKET
WINNIPEG, MANITOBA

GENERAL RULES AND REGULATIONS :

1. Honey Exhibitors shall be bona fide beekeepers with entries of pure honey from the current year production from their own personal apiaries.

2. An exhibitor may submit one entry in each section of each class. No Advance registration.

3. Exhibitors must accurately complete the entry form, and clearly mark each entry parcel with their name and address. An Entry form is to accompany entry parcel. Judges will ensure entries are placed in the appropriate classes. Entries must be free of any labels, with only initials or id on underside.

4. Entry deadline (NOTE: Class 3 section 3 allows Photography option) is 3:30 P.M., Wednesday September 21 2016. There is no entry fee. Honey entries should be sent to: **MANITOBA HONEY SHOW, c/o 625 Roseberry Street, Winnipeg, Manitoba R3H 0T4**. **ENTRIES SHOULD NOT ARRIVE BEFORE MONDAY, SEPTEMBER 20, 2016**.

5. Show judges shall consider any contestant ineligible if the entry fails to comply with the exhibit criteria or is unattractively displayed. Honey jars should NOT have a Label. Awards will be made by a scale of points and, in case of a tie; the highest score for flavour will be awarded the extra point.

6. All entries must be picked up by their owner at the end of the show, as items remaining at 4:00 P.M., Sunday, will become the property of the Red River Apiarists' Association and may be donated to a charity such as Winnipeg Harvest food bank.

7. The Honey Show is a consumer oriented educational and promotional event, sponsored by the Manitoba Beekeepers' Association, and organized and staffed by members of the Red River Apiarists Association.

8. A copy of these General Rules and Regulations, and a competition Entry Form are on-line at www.manitobabee.org (refer "Activities and Events" section of web site) and at www.BeekeepingManitoba.com (refer "Events" then "Honey Show").

MANITOBA HONEY SHOW
JUDGING STANDARDS (page 1 of 2)

LIQUID HONEY	POINTS
Appearance and uniformity of containers	5
Uniform level of fill	5
Colour	5
Freedom from crystals	15
Freedom from foreign material	15
Freedom from air bubbles either in suspension or as froth 15	
Uniformity of honey	5
Brightness	10
Flavour and aroma	10
Density (moisture content)	15
TOTAL	100

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GRANULATED HONEY	
Appearance and uniformity of containers	5
Uniform level of fill	5
Colour	5
Firmness of set	15
Freedom from foreign material	15
Freedom from froth and frosting	15
Uniformity of honey entry including texture	10
Flavour and aroma	10
Texture of granulation (smooth and fine)	20
TOTAL	100

CHUNK HONEY		POINTS
Appearance and uniformity of containers		5
Uniform level of fill		5
Uniformity of honey - both liquid and comb	5	
Freedom from crystals in both comb and liquid portions		15
Freedom from foreign material		15
Freedom from air bubbles either in suspension or as a froth	15	
Flavour and aroma	10	
Neatness of cut edges of comb honey pieces		15
Completeness of fill and completeness of cappings on comb honey pieces		15
TOTAL		100

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COMB HONEY		
Quality and uniformity of container sections		5
Cleanliness of containers	20	
Completeness of fill in container	20	
Completeness of capping		10
Cleanliness and appearance of cappings		20
Quality and flavour		10
Uniformity of comb sections including honey		15
TOTAL		100

MANITOBA HONEY SHOW
JUDGING STANDARDS (page 2 of 2)

BEST TASTE (&BEE-GINNER)

Flavour and aroma	70
Freedom from foreign Material	5
Moisture content	15
Freedom from froth	5
Uniformity of colour	5
TOTAL	100

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BEESWAX

Colour	30
Cleanliness (free from honey and impurities)	35
Uniformity of appearance	20
Freedom from cracking and shrinkage	15
TOTAL	100

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HONEY BEVERAGE

Flavour and aroma	70
Freedom from foreign material	10
Content Clarity	10
Freedom from froth	5
Presentation/Packaging	5
TOTAL	100

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Red River Apiarists' Association - Winnipeg, Manitoba
2016 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)

RRAA membership fee (cheque payable to RRAA or Red River Apiarists' Association. @ $25.00/year
NEW: Optional Beekeeper Liability Insurance (**details on RRAA web, Links, Insurance)** @ $45.00/year

TOTAL PAYMENT ENCLOSED……$_____

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

New Member [ ] Renewal [ ] Student U of M Beekeeping course [ ] [free 1st year] Other. Please specify. _____

Newsletter Delivered in electronic pdf via e-mail [ ] or on paper via Canada Post [ ]

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. Please do not send cash in the mail

MANITOBA HONEY SHOW

2016 COMPETITION ENTRY FORM

ENTRY CLOSING DATE: 3:30 P.M., Wednesday, September 21, 2016.

I hereby enter for competition, the exhibits herein described, and agree to abide by the rules and regulations of the Honey Show as posted on www.manitobabee.org or www.beekeepingmanitoba.com and be governed by them. I understand there is no entry fee, and that my name may be displayed on my entry during the public showing and in a competition report.

NAME_____
ADDRESS _____
CITY_____**PROV.**_____ **POSTAL CODE**_____
TELEPHONE _____**EMAIL**_____

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Class Number	Class Name	Mark "Beginner" if first time Entrant

Honey Exhibits must reach Honey Judge Coordinator, C/O MANITOBA HONEY SHOW, 625 Roseberry Street, Winnipeg, Manitoba R3G 0T4 by entry closing date. <u>All</u> exhibits not picked up by 4:00 P.M., on the last day of the show (Sunday), will become the property of the Red River Apiarists' Association and may be donated to a charity.

Signature of Exhibitor _____ **Date** _____