

2017 Provincial Apiarist Report

Ministry of Agriculture, Food and Rural Affairs
Apiary Program

October 2018

ONTARIO BEEKEEPING INDUSTRY AT A GLANCE

- Number of registered beekeepers: 3,331
- Number of producing colonies: 105,244
- Average honey yield/colony: 43 lb. (19.3 kg) per colony
- Total estimated honey crop: 4.4 million lb. (2.0 million kg)
- Overwinter honey bee losses reported by commercial beekeepers in 2017: 27 per cent

PREVALENCE OF DISEASES AND PESTS

During the 2017 beekeeping season, OMAFRA inspected a total of 1,006 bee yards where a total of 7,614 colonies received brood nest inspection and 22,439 colonies received top bar inspections (a scan of the top of the frames for the presence of small hive beetle).

- American foulbrood: 1.18 per cent
- European foulbrood: 0.03 per cent
- Sacbrood virus: 1.67 per cent

YEAR HIGHLIGHTS

- Ontario beekeepers reported an overall overwinter honey bee mortality of 27 per cent in Ontario for the winter of 2016-2017. This was higher than the overwinter mortality reported in the previous year (18 per cent).
- Approximately 23,000 honey bee colonies were shipped outside of Ontario for the pollination of blueberry and cranberry crops in Eastern Canada.
- OMAFRA conducted regular and targeted inspections focused on assessing the presence of the small hive beetle (SHB), which was identified in 18 bee yards in the counties of Haldimand, Niagara, Norfolk and Timiskaming. All honey bee colonies and associated equipment at these yards were detained while beekeepers completed and submitted biosecurity and movement plans. The small hive beetle quarantine area (Essex County and part of Chatham-Kent County) remains in place.

WEATHER PATTERNS

The weather was cool and rainy for much of the spring and summer in many areas of Ontario. This contributed to high rates of swarming in spring and very poor conditions for a honey crop during the main summer flow. Late fall (October) was characterized by very warm weather resulting in a substantial fall flow of honey.

HONEY PRODUCTION

Honey survey questionnaires were mailed to registered Ontario commercial beekeepers (those operating 50 or more colonies) to estimate the average honey production in the province. Responses were received from 42 per cent of commercial beekeepers, representing 34,300 colonies across the province.

Based on these responses, the estimated average honey production in Ontario was 43 lb. or 19.3 kg per colony. This is a major decrease in honey production since 2016 (91 lb. or 41.4 kg per colony) and below the previous five-year average.

The honey flow varied by location. In most areas of the province there was too much precipitation and colonies were rebuilding from a year where a high proportion of colonies were reported to have swarmed. As such, many beekeepers anecdotally reported very low honey yields which aligns with the results of the honey survey.

OUT-OF-PROVINCE POLLINATION

In recent years, the demand for pollination services for berry crops in Eastern Canada (Quebec, New Brunswick, Nova Scotia and Prince Edward Island) had been trending upwards until 2017. The number of honey bee colonies leaving Ontario to pollinate crops in Eastern Canada increased from 12,600 colonies in 2010 to 38,000 colonies in 2016. In 2017, a decrease in the market demand and price for wild blueberries contributed to a decrease in the demand for honey bee colonies being contracted from Ontario for pollination services. Approximately 23,000 honey bee colonies were moved from Ontario to Eastern Canada in 2017 for the purpose of pollination.

To ensure the demand for pollination services continues to be met, Ontario and the Eastern Canadian provinces worked collaboratively to develop additional pre-transportation inspection requirements before colonies were shipped across provincial borders, which allowed for the continued movement of Ontario honey bee colonies. Of particular concern was the spread of small hive beetle from regions in Ontario to eastern Canada.

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PREVALENCE OF PESTS AND DISEASES

The prevalence of common apiary pests and diseases was assessed by ministry apiary inspectors during the inspection of 7,614 colonies (brood nest inspections) during the beekeeping season. Inspectors checked for *Varroa destructor* mites in 2,400 of the colonies receiving brood nest inspections and checked for SHB in an additional 22,439 colonies through top bar inspections.

American Foulbrood (AFB) and Other Brood Diseases

AFB (*Paenibacillus larvae*) was detected in 90 honey bee colonies or 1.18 per cent of the colonies inspected in Ontario. This represents an increase from 2016 when AFB was observed in 0.51 per cent of colonies.

Sample analysis has confirmed that the strains of AFB circulating in Ontario remain susceptible to oxytetracycline. This is good news since antibiotic resistant strains of AFB have been detected in other jurisdictions across Canada. Antibiotics are not a cure for AFB, rather they are to be used prudently as a management option to reduce the chances of clinical (observable) AFB infection becoming established in a colony. When a colony has clinical AFB, antibiotics are not effective and all infected colonies must be destroyed by fire. AFB remains a very serious disease of honey bees with the potential to cause economic loss within a beekeeping operation and at a population level. Beekeepers who observe symptoms of AFB should contact their local apiary inspector immediately. For a list of provincial apiary inspectors, see www.tiny.cc/beeinspector.



A positive 'ropey test' for American foulbrood

Small Hive Beetle (SHB)

A total of 18 apiaries, both commercial and small-scale, tested positive for SHB in Ontario (11 in Niagara County, one in Haldimand County, five in Norfolk County and one in Timiskaming County). This represents fewer new detections in 2017 as compared to 2016 (n=21). Due to the high rate of inspection of colonies in the Niagara region to allow for the movement of colonies for out-of-province pollination, colonies in this region make up a large proportion of apiary inspections.



Small hive beetle in wax comb

In addition to the standard inspection of colonies, ministry inspectors also performed targeted SHB inspections where the top bars of frames directly below the inner cover are assessed visually. When a colony is suspected to be positive for SHB upon visual inspection, a specimen (either adult or larvae) is collected and submitted to the University of Guelph's Animal Health Laboratory for confirmatory testing using molecular analysis.

Small hive beetle is capable of damaging colonies when conditions are ideal and when colonies are not managed properly. However, at present, there have been very few reports of SHB creating damage under Ontario conditions. The presence of larvae, which is the main cause of SHB damage to colonies, is documented during apiary inspections. Although SHB larvae has been found in honey bee colonies in Ontario, they are typically at low, non-damaging levels of infestation. Any potential impact from SHB will depend on the beekeeper's management practices and specific environmental conditions that may allow beetle larvae to increase. To date, the impact of this pest in Ontario has been limited.

The province has transitioned from a SHB eradication strategy to a management strategy which is consistent with other jurisdictions. Through the SHB working group (comprised of representatives from the beekeeping sector, technology transfer specialists and government representatives), OMAFRA is collaborating with industry, specialists and other provinces on options to limit the spread of SHB and mitigate the economic impact of this pest on Ontario's beekeeping industry. The ministry has created an on-line map (<http://tiny.cc/SHB-viewer>) showing the number of SHB positive bee yards confirmed in each township. This map not only provides current data to other jurisdictions that import Ontario honey bees, but also informs beekeepers about where SHB has been detected in Ontario which helps them to manage the risk to their beekeeping activities.

Small hive beetle has been found in several other Canadian provinces (i.e., British Columbia, Alberta, Manitoba, Quebec) prior to 2017. SHB was detected in Alberta (AB) and New Brunswick (NB) in 2017 and these cases were in association with the importation of colonies from Ontario. The movement of Ontario bees to AB was determined to be non-compliant whereas the movement of bees to NB was compliant. Although all required protocols were followed prior to sending colonies to NB, the risk of SHB cannot be entirely eliminated. Ontario continues to work closely with trading partners to mitigate the spread of SHB across Canada.

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PREVALENCE OF PESTS AND DISEASES (continued)

Varroa destructor Mites

The presence of varroa is widespread in North America and is found in apiaries across the province. This pest has been identified as the main culprit for the death and reduced populations of overwintered honey bee colonies in Ontario (Guzman *et al.* 2010). Monitoring varroa infestation throughout the season continues to be essential for beekeepers to confirm the degree of infestation at key times in the season and to determine if mite control methods were successful.

Ministry apiary inspectors sampling for varroa mites during regular apiary inspections typically documented low levels of infestation throughout the beekeeping season. Across the province, 2,400 (1,784 commercial + 616 small-scale) colonies were inspected for varroa using a standard alcohol wash.

As varroa is widely distributed across the province, the prevalence of these mites is not as informative as the degree of infestation. Guzman *et al.* (2010) established treatment thresholds for varroa infestations. They recommended that colonies be treated for varroa:

- in May if the infestation is greater than two per cent, and
- in August if the infestation is greater than three per cent.

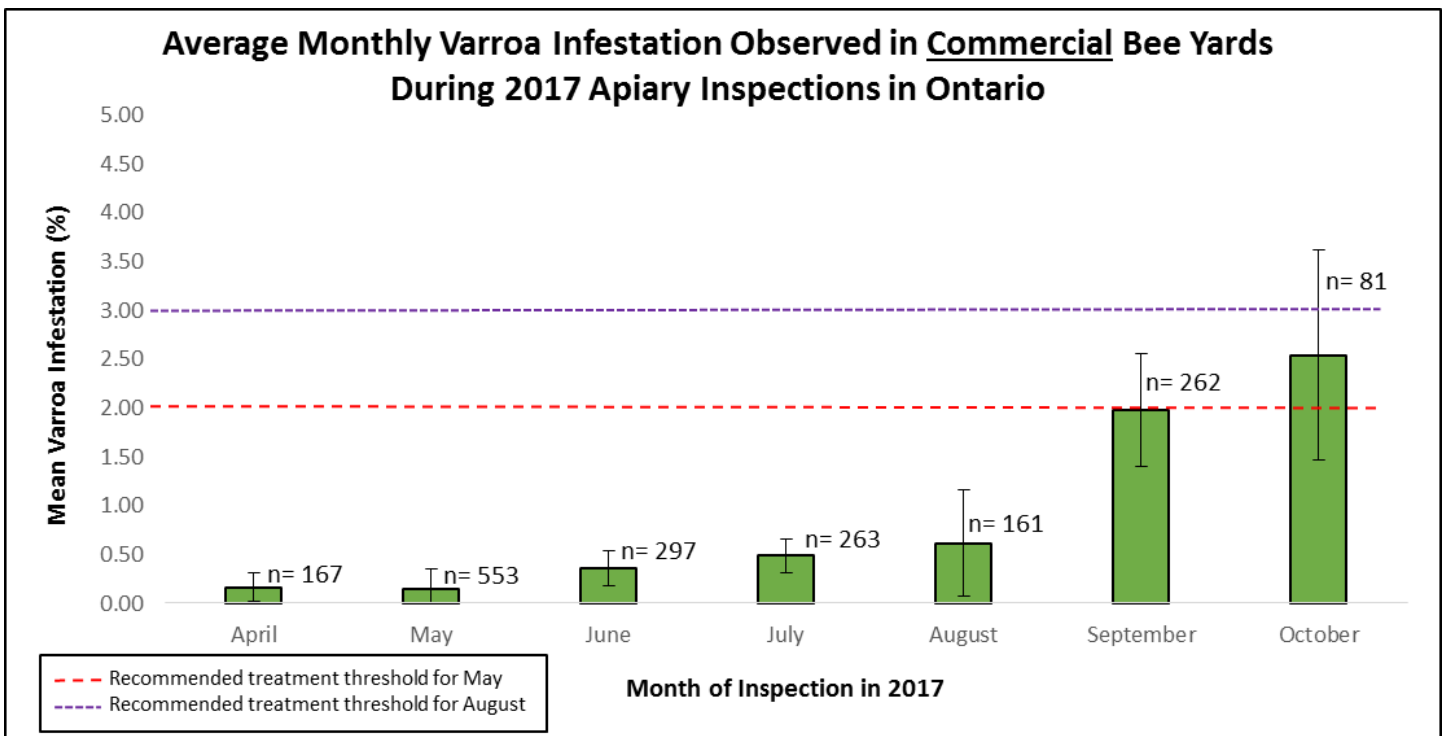


Fig. 1: Mean varroa infestation levels and treatment thresholds in Ontario commercial bee operations, 2017.

APIARY MONITORING

OMAFRA initiated the Apiary Monitoring Program in 2015 to determine the prevalence and load of apiary pests and pathogens in Ontario's apiculture industry. As part of this project, ministry inspectors visit selected apiaries across Ontario to monitor the prevalence of honey bee pests and pathogens multiple times throughout the season, assess and document the condition of colonies and collect samples that are subsequently tested for pathogens. Additionally, the Ministry of the Environment and Climate Change, now known as the Ministry of Environment, Conservation and Parks, initiated the Pollen Monitoring Network in 2015 to track the presence of pesticides in pollen collected by honey bees.

The data collected as part of the Apiary Monitoring Program provides a starting point from which subsequent monitoring data can be compared and, over time, will provide seasonal patterns and measures of honey bee pest and pathogen pressures. Monitoring data needs to be collected for multiple years before any broad conclusions can be made.

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PREVALENCE OF PESTS AND DISEASES (continued)

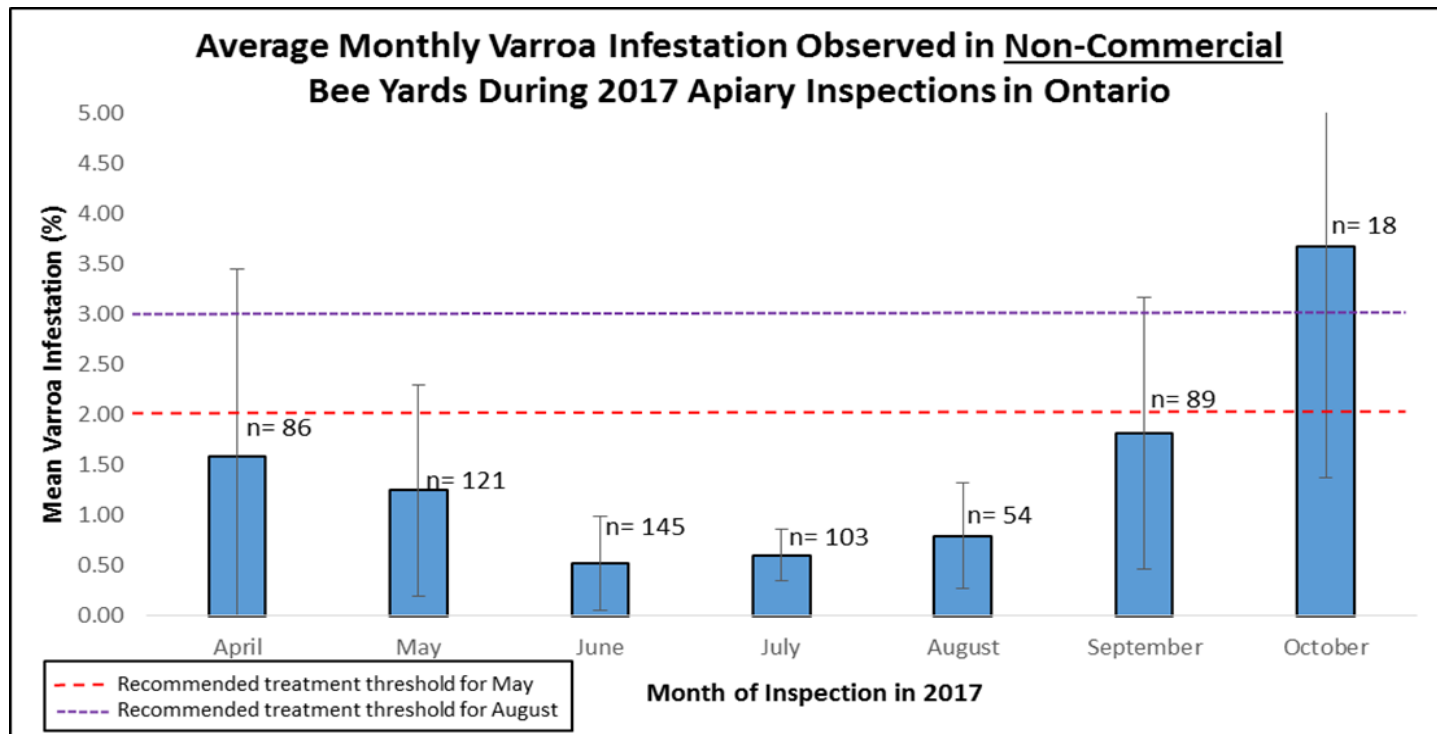


Fig. 2: Mean varroa infestation levels and treatment thresholds in Ontario small-scale honey bee operations, 2017.

Among commercial operations (those having 50 or more colonies), the mean varroa infestation remained below treatment thresholds and ranged from 0.15 per cent in May to 2.54 per cent in October (Fig. 1). The degree of varroa infestation among small-scale operations (those having 49 or fewer colonies) was variable, ranging from 0.52 per cent in June to 3.67 per cent in October (Fig. 1). The mean varroa infestation for small-scale operations was above recommended treatment thresholds in October.

The data presented here represents the colonies inspected in 2017 and is not necessarily reflective of the beekeeping industry across the province. The low degree of infestation among commercial honey bee operations may confirm the success that some beekeepers have had with the management of varroa mites. Some commercial operations however, reported anecdotally high varroa infestations in late fall. While most of the colonies sampled (represented by mean) during inspection for varroa mites were below the treatment threshold in fall (3 varroa mites per 100 bees), there were colonies that were above the threshold. This demonstrates that some colonies were likely going into winter with damaging levels of varroa infestation. Compared to commercial beekeeping operations, fewer colonies operated by small-scale beekeepers were inspected. This resulted in smaller sample sizes, particularly for August and October when 54 and 18 bee yards were inspected, respectively. Small sample sizes may have contributed to the observed increase in mean varroa infestation for small-scale operations in August and October. This highlights the importance of late season monitoring for varroa, both in September and in October, after varroa treatment has been applied, to ensure that the treatment was effective at lowering the level of infestation.

Treatments for *Varroa destructor* Mites

Treatments for varroa and any other pest or disease must be legally registered in Canada; including the product, the active ingredients and the application method(s). For effective treatment of varroa mites and to reduce the development of resistant populations, beekeepers must follow label directions when using control products. For example, if the label says to use 1 strip of an acaricide per 5 frames of bees, then a double brood chamber needs 4 strips. The [Ontario Treatment Recommendations for Honey Bee Disease and Mite Control](#) lists the only methods that should be used.

Beekeepers may have access to additional registered treatments in the near future. Bayvarol® is a synthetic strip product which uses the active ingredient flumethrin and has recently been registered for use in Canada. This product is available for the 2018 beekeeping season. Another product, Hopgaurd2, which uses hops extracts, has recently been submitted for registration in Canada.

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HONEY BEE MORTALITY

Overwinter Honey Bee Mortality

During the spring of 2017, a survey was used to estimate overwinter honey bee colony losses. The survey was distributed to 179 registered commercial beekeepers. Responses were received from 55 per cent of commercial beekeepers representing 44,183 colonies across the province. Based on the results of the survey, commercial beekeepers reported an approximate 27 per cent overall honey bee colony loss during the 2016-2017 winter. This was an increase over the 18 per cent winter loss reported in the previous year (2015-2016). In Canada, 15 per cent is considered the maximum acceptable winter loss. Small-scale beekeepers reported 29 per cent winter loss. The full report on 2017 overwinter losses is found online at www.ontario.ca/beekeeping.

In-Season Honey Bee Mortality

In-season honey bee mortality incidents have been reported from beekeepers throughout Ontario since 2012. A honey bee incident is defined as atypical effects characterized by bee mortality or sub-lethal effects observed in a honey bee colony reported and suspected by a beekeeper to be related to pesticide exposure. From 2012 to 2016, these incidents were reported to Health Canada's Pest Management Regulatory Agency (PMRA). Starting in spring of 2017, beekeepers were encouraged to report in-season honey bee mortality incidents to OMAFRA's Agricultural Information Contact Centre by calling 1-877-424-1300 or by reporting online at www.tiny.cc/beeincident.

OMAFRA APIARY PROGRAM

The Ontario apiary program includes the Provincial Apiarist, apiary inspectors across the province, an apiary data coordinator, two management staff and a number of office support staff.

The goals of the apiary program are to work with stakeholders to maintain the viability of Ontario's beekeeping industry, to enforce the Ontario *Bees Act* and regulation (including apiary inspections, issuing permits and beekeeper registration), to conduct monitoring to assess and report on bee health in Ontario and to advise on best management practices and treatment recommendations.

The apiary program engages in dialogue with colleagues in research, extension and policy roles both in Canada and internationally in addition to actively collaborating with numerous committees and working groups on a variety of topics, including:

- Pollination and Apiary Advisory Committee of Ontario – identifies priorities and gaps within apiculture in Ontario;
- Canadian Association of Professional Apiculturists – addresses specific issues such as honey bee imports, registration of pest and disease treatment options, new and emerging pests and diseases and overwinter mortality;
- Apiary Inspectors of America – allows for dialogue on regulatory, technical protocols and program policy;
- Ontario Animal Health Network – connects with industry expertise on pest and pathogen surveillance strategies.

ANTIMICROBIAL USE IN THE APICULTURE INDUSTRY

The federal government is in the process of implementing amendments to the Food and Drug Regulations and policies to increase veterinary oversight of antimicrobials. One significant change in particular will move antimicrobials deemed important to human medicine to Health Canada's prescription drug list, thereby requiring a veterinary prescription for purchase.

This change will apply to all producers who purchase products containing medically important antimicrobials, including beekeepers. Once enforcement begins on December 1, 2018, beekeepers will need to obtain a veterinary prescription which involves establishing a veterinarian-client-patient relationship, to purchase products including oxytetracycline and tylosin (both used to prevent American foulbrood and European foulbrood). These prescription products will only be available for purchase from a veterinarian or pharmacist.

The Ontario government is working with stakeholders, including the bee industry, to inform of the pending changes and facilitate relationships and communication with the College of Veterinarians of Ontario as beekeepers navigate new rules around access to needed products and to foster veterinary access to apiary knowledge and expertise. For more information, go to www.ontario.ca/ReduceAMR.



Également disponible en français

For more information:
Telephone: 1-877-424-1300 **E-mail:** apiary@ontario.ca

www.ontario.ca/beekeeping