

2013 Provincial Apiarist Report

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Infosheet

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Overview

Winter mortality (38 per cent for 2012-13) was higher than the previous year (12 per cent). Approximately 24,400 honey bee colonies left Ontario for pollination of cranberries and blueberries. Approximately 11,350 colonies were inspected for small hive beetle (SHB). SHB was found in six beeyards belonging to three beekeepers in the County of Chatham-Kent, adjacent to the Quarantine Area. All 110 honey bee colonies and associated equipment have been quarantined in each of these yards. The Quarantine Area remains in place in Essex County and part of Chatham-Kent County.

A number of incidents (covering 319 locations) citing bee mortality (acute and chronic) have been reported in association with corn and soybean seed planting. The primary concern is that honey bees are being exposed to damaging levels of neonicotinoid insecticides used to treat the seeds. These incidents are being responded to by the Ministry of Agriculture, Food and Rural Affairs (OMAFRA), (for pest, diseases and management practices) and the Pest Management Regulatory Agency (PMRA) with the Ministry of Environment (MOE) (pesticide residues). Residues of clothianidin and thiamethoxam have been found in the majority of honey bee samples collected from these reported incidents. The PMRA has concluded "that the majority of pollinator mortalities were a result of exposure to neonicotinoid insecticides" for incidents in both 2012 and 2013 and "that current agricultural practices related to the use of neonicotinoid treated corn and soybean seed are not sustainable".

The Ontario government established the Ontario Bee Health Working Group to provide advice on

how to prevent honey bee mortality in relation to corn and soybean seeds treated with neonicotinoid insecticides. The working group membership includes Ministry staff from OMAFRA, MOE, PMRA, including specialists in the area of pesticides, field crops and apiculture, along with beekeepers, grain farmers, pesticide and agrochemical industries.



A. Beekeeping Industry Statistics

- Number of registered beekeepers: 3,155
- Number of producing colonies: 97,500
- Average honey yield/colony: 65.26 lb (29.6 kg) colony
- Total estimated honey crop: 6,526,000 lb (2,600,000 kg)
- Colonies wintered last year (years 2012/2013): 101,000
- Average winter mortality: 38 %

B. Diseases and Pests

- American Foulbrood: 11,346 colonies inspected / 117 colonies infected = 1.3% incidence
- European Foulbrood: 11,346 colonies inspected / 1 colony infected = 0.05% incidence
- Chalkbrood: 11,346 colonies inspected / 118 colonies infected = 1.0% incidence
- Sacbrood virus: 11,346 colonies inspected / 52 colonies infected = 0.5% incidence
- Varroa mite (inspection was done on intensity, not incidence)
- Small Hive Beetle: 11,346 colonies inspected / 110 colonies infected = 1.0 % incidence

Weather Patterns

There were numerous cool and rainy periods throughout the 2013 season in Ontario.

Honey Production

Honey production decreased in Ontario in 2013 at 65.26 lbs / colony. The average honey crop in 2012 was 93.45 lbs / colony (2012 Honey Survey). The cool and rainy weather may have contributed to the reduced honey yield. Some beekeepers also reported a delay or failure of honey bee colonies to build up to the appropriate strength required to harvest the available nectar resources.

Pollination

Demand for pollination services for berry crops in Eastern Canada has increased in recent years. In 2010, 12,600 honey bee colonies left Ontario for pollination, 14,700 colonies in 2011, 26,000 colonies in 2012 and 24,400 colonies in 2013. This represents almost one quarter of the managed colonies in Ontario. These colonies left Ontario to pollinate blueberries, cranberries and canola in the provinces of Quebec, New Brunswick and Nova Scotia. There are indications that the blueberry acreage will increase substantially in Eastern Canada and Ontario with areas being developed in different areas of Northern Ontario within the next decade. This will further increase the demand for pollination services by Ontario beekeepers and provide additional opportunities for the industry to expand and diversify.

Pest and Disease Levels in Ontario Varroa and Tracheal Mites

Varroa sampling during regular apiary inspections showed low levels in many operations throughout the beekeeping season. These low levels may confirm the success that some beekeepers have had with their management of varroa mites. However, some cases of high varroa levels were observed, which could be traced back to the treatment strategy that the beekeeper had used. Therefore, beekeepers must ensure that their treatment strategy is effective in controlling varroa levels in their honey bee colonies. It is also essential that beekeepers monitor their levels of varroa and treat early before damage occurs in their colonies.

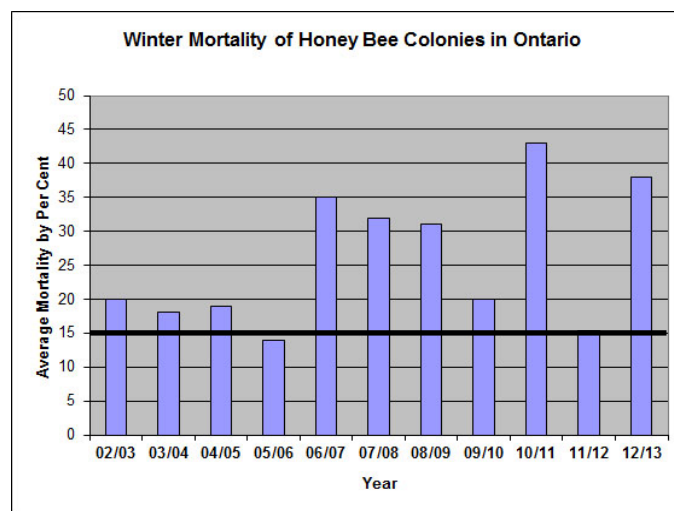
American Foulbrood (AFB) and Other Brood Diseases

In 2013, American Foulbrood (AFB), *Paenibacillus larvae*, was found in 30 beeyards, representing 117 honey bee colonies or 1.3 per cent of inspected colonies in Ontario. This figure may reflect the focus on "at-risk" beeyards, based on proximity to other infected locations.

Other brood diseases that were tracked by the Apiary Program include European Foulbrood, *Melissococcus plutonius*, chalkbrood, *Ascosphaera apis*, and sacbrood. (See Section B).

2013 Ontario Apiculture Survey Results - Levels of Winter Loss and Management Practices of Ontario Beekeepers

The level of honey bee colony mortality over the winter was 38 per cent. This level of winter loss in Ontario is a major concern for beekeepers. This is up significantly from last year's 12 per cent reported mortality. The threshold of acceptable levels of winter loss is 15 per cent*.



***Figure 1:** The threshold of acceptable levels of winter loss is 15 per cent. Source: Canadian Association of Professional Apiculturists (CAPA)

Winter mortality was more than double that level in the years of 2007 to 2009 and nearly three times that level in 2011.

Management Practices

Ontario beekeepers have a variety of chemical treatment options available to manage varroa mites. The most popular synthetic acaricide treatment is Apivar®, with the limited use of Checkmite++™ by beekeepers. There are documented resistance issues with Checkmite++™ and Apistan® in Ontario. Although there are populations of varroa in Ontario that are resistant to Apistan®, this resistance can vary (70 to 90 per cent efficacy in controlling varroa mites in honey bee colonies - Technology Transfer Program, Ontario Beekeepers' Association (OBA) - personal communication). As such, beekeepers are still using Apistan® in rotation with other mite treatments. Many beekeepers are still using 65 per cent liquid formic acid as regular treatment option, especially in the spring.

Small Hive Beetle Status

The distribution and population levels of Small Hive Beetle (SHB) in Ontario are being tracked by the Apiary Program. Colonies are visually inspected for the presence of SHB adults and larvae.

Apiary Inspectors have also monitored targeted sites. These targeted sites are located in areas that are of potentially higher risk of being infested by SHB (Counties of Lambton, Niagara, Chatham-Kent and those along the St. Lawrence), either by their geographic proximity (along the USA border) to areas known to have SHB or by suspected association with a known area (e.g. through known or suspected trace-outs, selling, or movement of honey bees).

In total, 11,346 honey bee colonies were inspected for the presence of SHB. Small Hive Beetle was present in six of the 876 sites (Section B). This is the same number of positive sites as in 2012 and 2011. All positive locations were found in Chatham-Kent County, directly adjacent to the Quarantine Area (Essex County and part of Chatham-Kent County). The six positive sites include three different beekeepers and 110 honey bee colonies. All honey bee colonies and associated equipment have been quarantined at these six locations. In three of the six locations, the honey bee colonies and

equipment have since been moved into the Quarantine Area. The Quarantine Area remains in place in Essex County and part of Chatham-Kent County.

For more information on biosecurity practices and identification of SHB see:

- www.omafra.gov.on.ca/english/food/inspection/bees/biosecurity.htm
- www.omafra.gov.on.ca/english/food/inspection/bees/shb-reportfindings.pdf

Bee Kill Incidents

During the beekeeping season of 2013, there were multiple reports from beekeepers throughout Ontario experiencing bee kill incidents (approximately 319 locations and 79 affected beekeepers). Beekeepers have reported these incidents to the PMRA. The symptoms documented and reported by beekeepers were characteristic of acute pesticide poisoning (large piles of dead bees in front of the colony, trembling, shaking and atypical behaviour displayed in bees). Health Canada has analyzed samples of dead bees collected from these incidents. Samples were screened for multiple pesticides. Seventy-five per cent of the samples were positive for levels of commonly used pesticides on corn seed and soybean seed (clothianidin and thiamethoxam). (It is also important to note that, though the analysis indicates the presence of clothianidin, thiamethoxam breaks down to metabolites that include clothianidin).

In most cases, damage was reported close to the planting of treated corn seed (by proximity and by date). In 2013 however, approximately one-third of the reported incidents took place in summer and fall. As such, other routes of exposure are being examined. This is the second year in a row this issue has been reported in Ontario.

The PMRA reported that, “the information evaluated to date, suggests that clothianidin and/or thiamethoxam contributed to many of the 2013 bee losses,” and that, “preliminary information indicates that there may be differences in the information reported for the 2013 incidents which included losses of field force; steady decline in population; and more reports of lack of recovery

and chronic or ongoing effects such as queen and brood effects.”

The PMRA has released a detailed report on the specifics related to the bee kill incidents in 2012. Preliminary reports are available for 2013. It is important to note that with all the incidents there were no known cases of off-label or improper use of pesticides by the growers.

- www.healthcanada.gc.ca/pollinators
- www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/bee_corn-mort-abeille_mais/index-eng.php
- www.hc-sc.gc.ca/cps-spc/pubs/pest/_fact-fiche/bee_mortality-mortalite_abeille-eng.php
- www.hc-sc.gc.ca/cps-spc/pest/part/consultations/_noi2013-01/noi2013-01-eng.php

In 2013, clothianidin and thiamethoxam were found in all sample categories (dead and dying

honey bees, live honey bees, pollen from the brood nest, honey from the brood nest, water from the surrounding area, and flowering vegetation). These compounds were found in most pollen and honey bee samples from colonies reported to be affected. The proportion and levels of these compounds are covered in the following report: www.hc-sc.gc.ca/cps-spc/pubs/pest/_fact-fiche/bee_mortality-mortalite_abeille-eng.php

More incidents of acute pesticide damage have been reported in Ontario than any other region of North America. Approximately four per cent of all registered beeyards in Ontario have been affected and, in some counties, the proportion of affected beeyards may be more than 30 per cent. The reason for this significant number of reports during the past season has yet to be determined. Further research and the analysis of incident reporting and environmental assessment by regulators are ongoing to help clarify and address this issue.

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