2010 Provincial Apiarist Annual Report

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November 2010

Beekeeping Industry Statistics

- No. of Registered Beekeepers 2,628
- No. of Producing Colonies 83,166
- Average Yield/Colony (lb/kg) 100.25 lb / 45.1 kg
- Total Estimated Crop (lb/Kg x1000) 5,589 lb / 2,535 kg
- Colonies Wintered Last Year (09/10) 80,000
- Average Winter Mortality (%) 20%

Diseases and Pests

Disease/Pest	Number of Inspections	Number of colonies inspected*	Number of Beekeepers Inspected	Disease Colony Incidence	Disease Beekeeper Incidence
AFB	1,134	25,000	534	132/25,000=0.5%	NA
EFB	1,134	25,000	534	5/25,000=0.02%	NA
Chalkbrood	1,134	25,000	534	455/25,000=1.8%	NA
Sacbrood	1,134	25,000	534	88/25,000=0.4%	NA
Tracheal Mite	See below	NA	NA	NA	NA
Varroa Mite	See below	NA	NA	NA	NA
Other	See below	NA	NA	NA	NA

*estimated

Comments

2010 was an eventful year for apiculture in Ontario.

The winter leading up to the spring was uncharacteristically mild throughout many regions of Ontario. Spring arrived early with most colonies becoming active three weeks earlier than normal (foraging and brood rearing) across most regions of the province. Early spring was typically warm with a brief period of colder weather occurring. Late spring and summer were characterized by sustained hot weather. Fall arrived early in many regions with cooler temperatures settling in early October.

Honey production
It was an exceptional year for honey production, with many beekeepers claiming that it was their best year on record. Two major factors — strong, populous colonies and sustained hot and humid weather — likely account for the heavy honey flow. At many times this summer, beekeepers were in short supply of spare honey supers.

Although many regions reported substantial honey production well above average, not all regions had the same outcome. In some areas, the nectar flow started heavy and tapered off in mid summer. This, along with an earlier cold period in fall may account for the lower than expected yield experienced by some regions.

Spring build-up of honey bee colonies in many operations was substantial. Anecdotally, there were high levels of swarming throughout Southern Ontario. This can be attributed to the hot weather, early spring and colonies that were populous early in the season.

Varroa and tracheal mites
Varroa and tracheal mites are well established and widely distributed throughout Ontario. The only region where varroa or tracheal mites have not been recorded in Ontario is the region of Thunder Bay. Varroa mites resistant to both fluvalinate and coumaphos continue to be documented throughout the province through resistance testing by the Ontario Beekeepers' Association's Tech-Transfer Program. At present amitraz resistance has not yet been documented in Ontario. American Foulbrood (AFB) samples are sent to the USDA Lab in Beltsville, Maryland to test for antibiotic resistance. At present, resistance to Oxy-tetracycline has not been found in any sample of AFB in Ontario.

Pollination
Pollination continues to be an important source of income for beekeepers with many operations relying on the revenue from pollination services, particularly from blueberry pollination in New Brunswick and Québec. There was a decrease in the demand for pollination services this year, due to lower blueberry prices. However, towards June a number of contracts picked up and there were many more colonies required than originally anticipated. In total, 12,618 colonies were moved to New Brunswick and Québec for pollination in June.

As in previous years, colonies were inspected by OMAFRA for the presence of AFB and SHB as required by the receiving provinces. Beekeepers also moved colonies west in 2010. Several hundred Ontario colonies were moved into south central Manitoba for honey production.

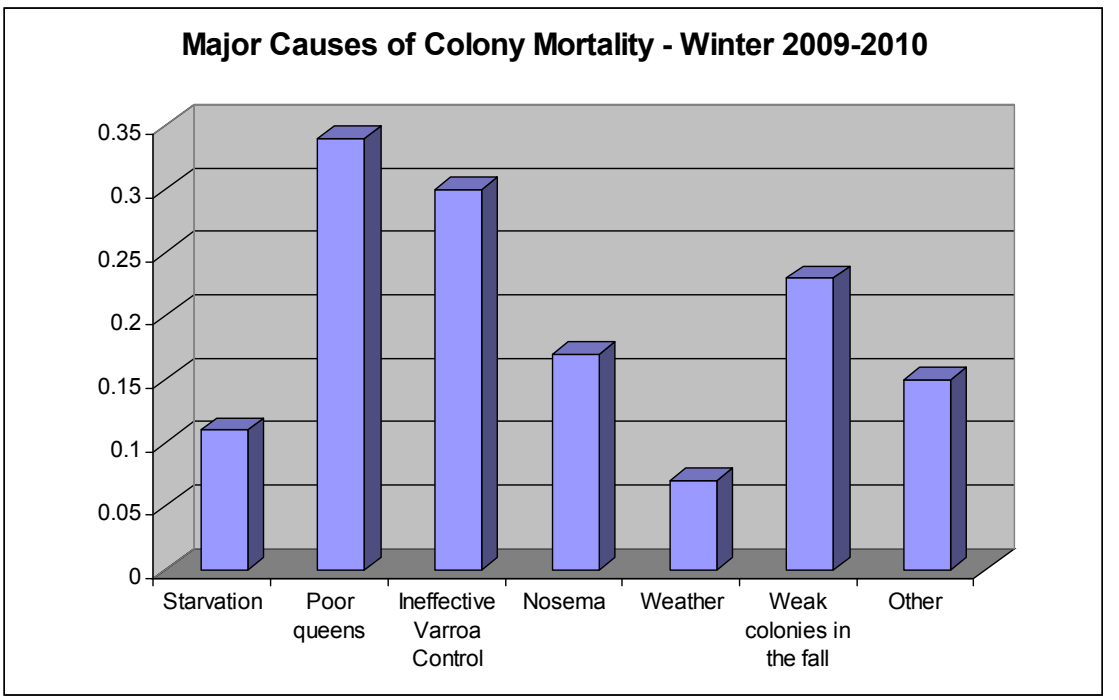
2010 apiculture survey results
The provincial average for colony mortality over the winter of 2009-2010 was 20 per cent. This was also the national average across Canada. This level of colony mortality is lower than that of the previous three years (an average of 33 per cent for 2007, 2008 and 2009) in Ontario. This level of colony mortality, however, is still higher than the 15 per cent threshold that the extension and research community considers sustainable for maintaining a commercial beekeeping operation.

Of the surveyed beekeepers in Ontario, 46 per cent reported that they had monitored for mites in the fall of 2009, while 53 per cent reported that they had not sampled for mites at that time, and 2 per cent abstained from responding. Among the monitoring methods, the sticky board method was the most

popular, with 30 per cent of surveyed beekeepers preferring this method, followed by the ether roll (22 per cent) and alcohol wash (13 per cent). The importance of monitoring for varroa as a part of assessing colony health and the efficacy of treatments cannot be stressed enough.

High levels of colony mortality can still be largely attributed to inadequate varroa mite control in honey bee colonies. This factor had been identified by the research and extension community of Canada and supported by recent research from the University of Guelph (Guzman *et al*., 2010). This study identified varroa mites as the primary factor, and insufficient food stores and cluster sizes as secondary factors, in colony mortality.

Graph 1 shows the major causes of colony mortality identified by beekeepers in the survey.

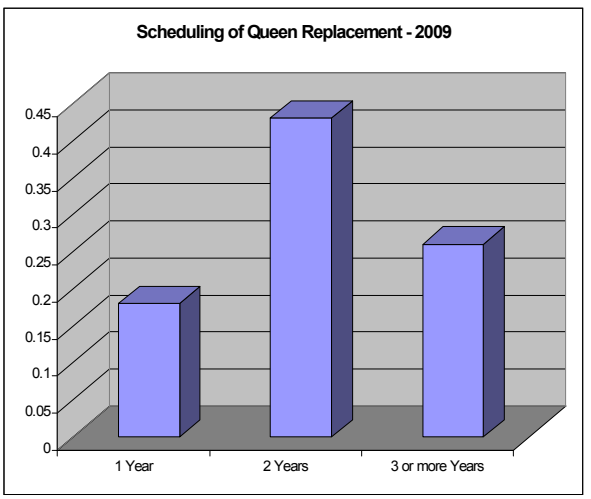


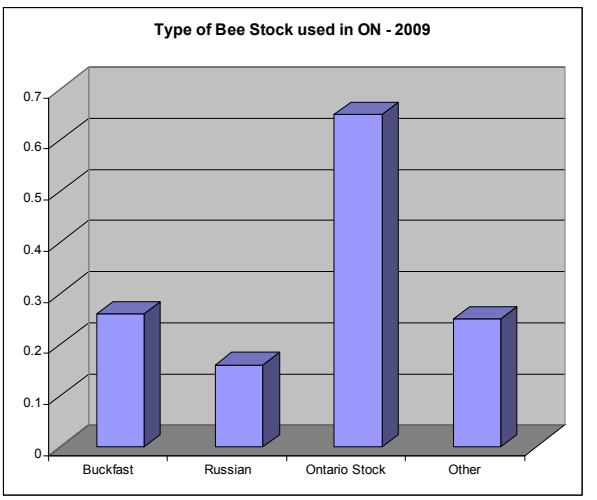
The two most substantial factors identified by beekeepers for colony mortality were ineffective varroa control and poor queens. Varroa control is still a very important issue in Ontario. There are beekeepers who are continuing to use products where resistance is well established. Type of treatment, timing of treatment and monitoring of efficacy through sampling is important for all beekeepers.

Anecdotally, many beekeepers have expressed concern over the high levels of failure in queen health in their operations and have noted higher than acceptable levels of early supersedure.

Graphs 2 and 3 represent the practices in queen replacement and the type of stock used by beekeepers in Ontario. Most beekeepers in Ontario are continuing to use local stock although Buckfast stock and Russian stock are still popular. New Buckfast breeding stock has recently been imported into Ontario from a certified Buckfast breeder in Denmark through the University of Guelph and collaborating queen breeders. This new stock has been established in isolated locations in Central Ontario.

Graph 2 and Graph 3





Note: Additional analysis of the 2010 apiculture survey can be found at http://www.omafra.gov.on.ca/english/food/inspection/bees/apicultu.html

New and Emerging Pests

There were two significant developments in new and emerging pests in 2010, both involving small hive beetle *Aethina tumida* (SHB).

SHB in Hawaiian queens

On April 27, 2010 SHB was confirmed in East Hawaii for the first time. The Canadian Association of Professional Apiculturists was informed of the find and, subsequently, all regions of Canada assessed the risk of importing SHB. As Ontario receives a substantial number of Hawaiian queens every year this was seen to be a potential risk, particularly since shipments of Hawaiian queens were distributed to a number of beekeepers before the confirmation was made in Hawaiian.

As part of the apiary program follow-up, all queen importers were contacted, all beekeepers who received Hawaiian queens after the discovery of SHB were contacted and colonies in yards that received Hawaiian queens were inspected by provincial bee inspectors. No SHB or symptoms of SHB were found in any of the operations inspected, nor the large numbers of queens that were individually inspected while held in quarantine in Western Canada. As a result of all of the follow up in Ontario and the experience out West, the risk of infestation was determined to be low.

SHB in Ontario

On September 8, 2010, SHB was reported in Essex County, in extreme south-western Ontario,. On September 15, 2010, SHB was confirmed by the National Identification Service at Agriculture and Agri-Food Canada. This is the first confirmation of SHB in Ontario.

On November 2, 2010 it was confirmed that sequencing done on the original samples were 100 per cent identical to the 'NA1' haplotype of SHB. This is one of the two prevalent haplotypes found in the U.S. since the late 1990s. This indicates that the introduction was from the U.S. population of SHB.

Apiary inspections were immediately expanded to determine the distribution of SHB in high-risk areas of Ontario, including regions along the Canada/U.S. border and regions adjacent to Essex County.

Since the initial find of SHB in Ontario, 226 apiaries, covering ~5,374 honey bee colonies, have been inspected for SHB. Of all the bee yards inspected, 15 were found to be infested, all in Essex County.

At the time of this report, the Ontario Ministry of Food Agriculture and Rural Affairs (OMAFRA) had issued 16 quarantines on 15 infested bee yards and one quarantine on an extraction facility under suspicion of potentially harboring SHB. All quarantines were issued under the Animal Health Act of Ontario.

The primary purpose of the quarantines is to prevent further spread of SHB to new premises within Essex and to regions outside of Essex. Both the natural capacity for SHB dispersal and potential for beekeeper-assisted dispersal through transported colonies and equipment are being taken into account in all efforts to mitigate the spread of SHB.

Information about SHB was sent to every registered beekeeper in Ontario upon confirmation of SHB in Essex County, detailing the identification, biology and impact of SHB, as well as best management practices, treatments, biosecurity practices and prevention.

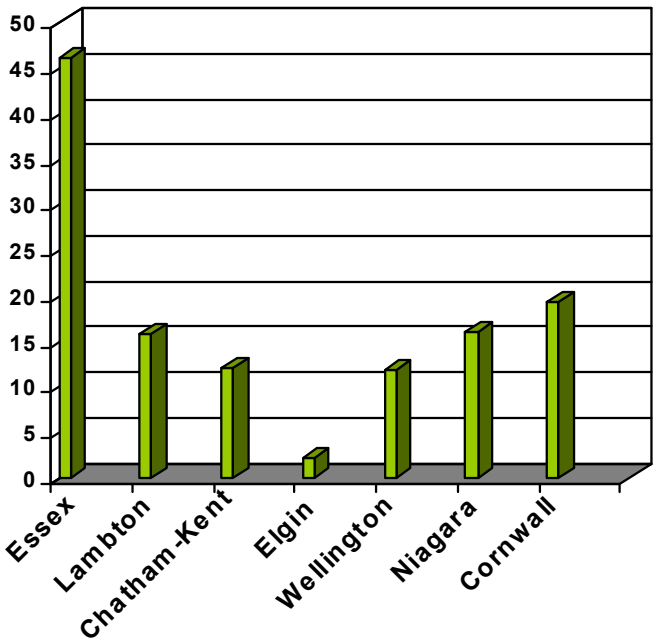
To minimize stress on colonies during cold weather, the Apiculture Program modified its inspection strategy in mid-October. Inspections are currently conducted exclusively through the placement of SHB traps on the bottom board. The SHB trap consists of a CheckMite+™ strip and corrugated plastic. Although the traps are placed primarily for inspection purposes, they also function to kill SHB in colonies and reduce their numbers in apiaries. One SHB trap is placed in every colony in an inspected yard. All 15 quarantined yards in Ontario are now being monitored using SHB traps.

Beekeepers can use Permanone (active ingredient Permethrin) as a ground drench for treating infested yards, targeting the pupal stage of SHB. This treatment was made available through an Emergency Use Registration through the Pest Management Regulatory Agency (PMRA). At this time, Ontario is the only jurisdiction in Canada to have this treatment available.

All registered beekeepers in Ontario are also able to use CheckMite+™ (according to the label instructions) to treat SHB inside infested colonies.

Graphs 4 and 5 show percentage of total number of bee yards and percentage of total number of bee colonies inspected since September 2010.

Graph 4. Percentage of Total Bee Yards / County Inspected for SHB since Sept. 2010



Graph 5. Percentage of Total Colonies / County Inspected for SHB since Sept. 2010

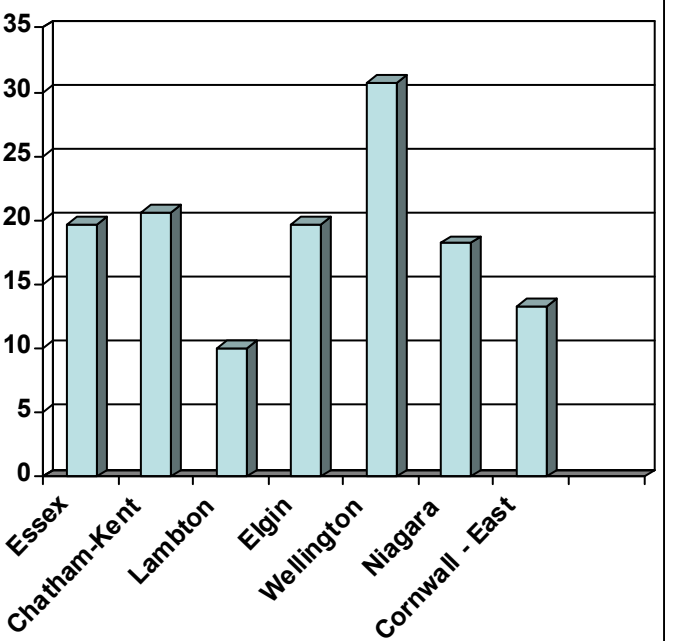
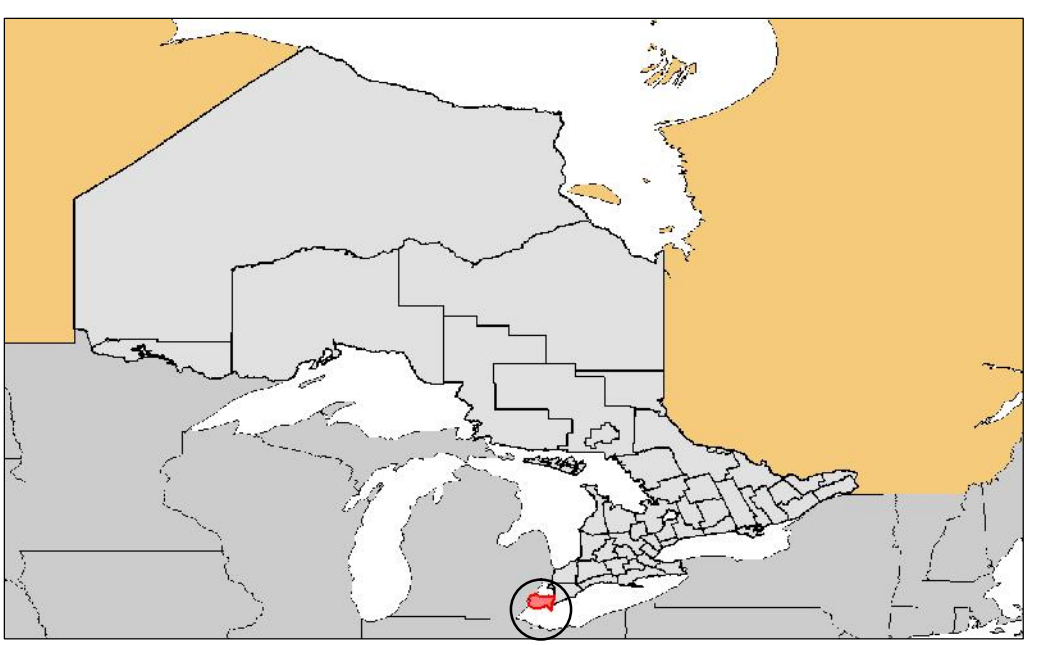


Figure 1. Current Distribution of SHB in Ontario
The current SHB distribution is restricted to Essex County (circled).



The current focus for SHB response is to pursue trace-out inspections of any potential movements from the 16 infested premises or operations.

Since the first find of SHB in early September, the apiculture program in Ontario has obtained a representative distribution of SHB in the province, based on thousands (~5,400) of colonies inspected in high-risk regions and using movement information from operations. Current inspection data indicates that SHB has a distribution that is restricted in the extreme south- western corner of Ontario, along the Michigan border.

The timing of the find of SHB in Ontario at this time has worked in favour of mitigation strategies. It is the end of the active season and all colonies are stationary. Over the winter the existing quarantines will be maintained in an effort to minimize the spread of SHB and the Ministry will continue to conduct inspections and more detailed risk analysis.

OMAFRA's apiary program will continue to work closely with staff from other OMAFRA program areas, including the Animal Health and Welfare Branch, the Canadian Food Inspection Agency and other provincial apiarists on this issue.

The province is continuing to evaluate options to minimize the spread and establishment of SHB in Ontario.

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Recommended reading

Giovenazzo, P. and Boucher, C. 2010. A scientific note on the occurrence of the small hive beetle (*Aethina tumida* Murray) in Southern Quebec. American Bee Journal 140(3): 275-276.

Guzman-Novoa, E.; Eccles, L; Calvete, Y; McGowan, J; Kelly, P.G.; Correa-Benitez, A. 2010. *Varroa destructor* is the main culprit for the death and reduced populations of overwintered honey bee (*Apis mellifera)* colonies in Ontario, Canada. Apidologie. 41(4) : 443-450.

Currie, R.W.; Pernal, S.F.; Guzman-Novoa, E. 2010. Honey bee colony losses in Canada. Journal of Apicultural Research 49(1): 104-106.

Kozak, P. Small Hive Beetle in Ontario. Hivelights 23(4): 10-12.

Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Apiculture Website: http://www.omafra.gov.on.ca/english/food/inspection/bees/apicultu.html

Small Hive Beetle Advisory
http://www.omafra.gov.on.ca/english/food/inspection/bees/shb-advisory.htm

Small Hive Beetle:
http://www.omafra.gov.on.ca/english/food/inspection/bees/info-shb.htm

Small Hive Beetle Treatment Recommendations:
http://www.omafra.gov.on.ca/english/food/inspection/bees/info-shb-treatment.htm

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