



CAPA Statement on Honey Bee Wintering Losses in Canada (2012)

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In 2012, the Canadian Association of Professional Apiculturists (CAPA) National Survey committee developed a core set of questions that the Provincial Apiarists surveys could use to report on honey bee wintering losses in their province. These standardized questions facilitated direct comparison of key wintering loss data across the country. The following report is a summary of the reported winter losses from the provincial surveys.

Over the winter of 2011 / 2012, the average level of wintering loss of honey bee colonies (i.e. colony mortality or colonies too weak to be commercially productive) across Canada was 15.3% (Table 1). This is the lowest wintering loss rate for Canada in the past six years (Figure 1). In comparison to last year, provincial wintering losses were also lower this year for all provinces (Figure 2).

Table 1. Gross Wintering Losses by Province, 2011/2012

Province	Number of Colonies Wintered Fall 2011	Number of Dead or Unproductive Colonies Spring 2012	Percent Wintering Loss (%)
British Columbia	42,000	11,340	27.0
Alberta	274,000	35,620	13.0
Saskatchewan	90,000	15,300	17.0
Manitoba	80,000	12,800	16.0
Ontario	90,000	10,800	12.0
Quebec	40,000	6,400	16.0
New Brunswick	6,800	1,900	27.9
Nova Scotia	17,500	3,308	18.9
Prince Edward Island	5,300	1,007	19.0
CANADA	645,600	98,475	15.3

Weather:

Weather was seen as a major factor in the reduced wintering losses in 2011 / 2012. The mild winter condition combined with healthy bees resulted in fewer colonies dying during winter and a greater proportion of strong colonies in the spring. Many provinces reported that spring arrived early, thus allowing population build up to occur earlier than usual. This was not the case in every region of every province. Many parts of B.C.

reported a cold, wet spring, which contributed to the dwindling of colonies coming out of winter.

In the previous winter, 2010 / 2011, the winter was cold and long followed by a cold wet spring that delayed the population build up of honey bee colonies in many regions of Canada. Though management and pest and disease issues are often considered the principal factors influencing honey bee health, the last two seasons have highlighted that weather may still be a critical factor when it comes to wintering loss in Canada. Weather may also be a factor with respect to the population dynamics of honey bee pests and diseases, particularly related to the development of the colony as in the case with varroa and periods of brood rearing.

Varroa control:

The vast majority of beekeepers in Canada are managing varroa levels at regular intervals through chemical and cultural means. The continued management of varroa in honey bee colonies is widely recognized as one of the primary goals with respect to maintaining honey bee health. Apivar®, when used properly, provided effective management of varroa infestations. Beekeepers in Canada are still regularly using organic acids as part of the rotation of chemical treatments, but continue to rely heavily on synthetic treatments. Although there are a variety of chemical options available to beekeepers, all have their advantages and disadvantages. This includes timing of treatments, pattern of use, temperature dependence and the development of resistance in varroa mite populations. The use of new methods of varroa control in an integrated pest management framework is therefore essential to the sustainability of mite control for this industry. The promotion of monitoring and using effective control options continues to be the focus of many extension and education activities promoting honey bee health. Beekeepers awareness of these principles and the adoption of best management practices that incorporate good food safety practices are regarded as the future direction for this industry.

Nosema:

Nosema is still considered a serious pathogen in Canada that may be influencing colony survival. In Alberta, nosema was cited as one of the major reasons for colony mortality in a few operations. In the past, nosema disease was recognized primarily as a winter disease. It has long been established that *Nosema apis* increases in severity throughout the winter months, peaking in early spring. Fumagilin treatments have been demonstrated to suppress levels of *Nosema apis*. With the discovery of *Nosema ceranae*, the seasonal relationship between nosema disease and honey bee health is less clear. Furthermore, there may be regional variations that may underlie the severity of nosema disease. Current strategies to address nosema disease include research projects that address the impact of the disease on the health of colonies. Novel treatment options must be developed along with programs that promote monitoring disease levels as part of the management strategy for this disease.

Pesticides:

There are still many concerns amongst beekeepers regarding the potential chronic and sub-lethal impact of pesticides and agrochemicals (particularly systemic insecticides). Researchers continue to examine how pesticide effects may impact the long term survival of honey bee colonies, particularly during winter. In addition, Health Canada's (through the Pest Management Regulatory Agency) environmental assessment addresses the regulation of pesticides through continual risk based assessments and can document any reported pesticide incident.

Colony Collapse Disorder (CCD):

Symptoms by which CCD is being characterized in the U.S. have not been diagnosed by professional apiculturists in Canada. Increased levels of colony mortality in Canada are associated with increased levels of winter loss, seen as direct mortality during winter or dwindling during the early spring. The most clearly associated cause of increased winter mortality in Canada has been ineffective *Varroa* control, demonstrated in recent research from Ontario (Guzman et al., 2010). Although many secondary pest, pathogen, environmental or management factors have been suggested to act individually or in combination to impact colony health, further research is required to establish conclusive links to ongoing patterns of colony death.

CAPA continues to be in close contact with scientists participating in U.S. working groups on colony losses. Members of CAPA have also been actively monitoring the status of bee health across the country and are sharing scientific information. Researchers within CAPA are active in evaluating alternative control options for *Varroa* mites, methods of integrated pest management (IPM) for honey bees and the breeding of queen stock more tolerant of diseases and mites. In several regions of Canada workshops have been conducted to promote IPM practices to beekeepers with particular attention given to surveillance programs to monitor pests and diseases, with emphasis on *Varroa* and *Nosema* spp. Attention has also focussed on proper disease identification, winter management, rotation of treatments and discouraging off-label use.

Members of CAPA, in cooperation with the Canadian Honey Council, are also pursuing the registration of alternative products for *Varroa* control in Canada. Other areas of research that CAPA members are currently pursuing include studies of honey bee immunity, honey bee viruses, genetic expression of honey bee responses to disease, the biology of new and emerging bee pests and best management practices to promote the health of colonies.

For more details on the status of honey bees in the USA see:

<http://beeinformed.org/2012/05/winter2012/>

Conclusion:

There was a positive improvement toward lower wintering loss in the spring of 2012. However, an improving trend must continue for several years before we can say with certainty that wintering loss is returning to what is considered a normal rate. Even within provinces that reported lower levels of wintering loss there is variation among different

operations with some operations reporting 50% to 80% losses. There were also large differences in mortality among specific regions in provinces. For example, Vancouver Island in B.C reported wintering losses of 64% compared to 20% wintering losses on mainland B.C.

Responses from provincial surveys indicated that ineffective varroa control, poor queen health, nosema and weak colonies in fall were the most common reasons for high wintering losses. Clearly the impacts of pest, pathogens and environmental factors continue to be a challenge to commercial beekeepers across Canada. There are a variety of strategies that have been pursued to address these challenges including applied and basic research, pest and pathogens monitoring, regulatory authority to address bee pests and pathogens that may threaten the industry, advisory and extension services to beekeepers promoting best management practices. It has become obvious that the future of beekeeping will depend on a multi-factorial approach to address the risks associated with honey bee health and wintering honey bees in Canada

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Figure 1. Average National Wintering Loss rates in Canada 2007 -2012

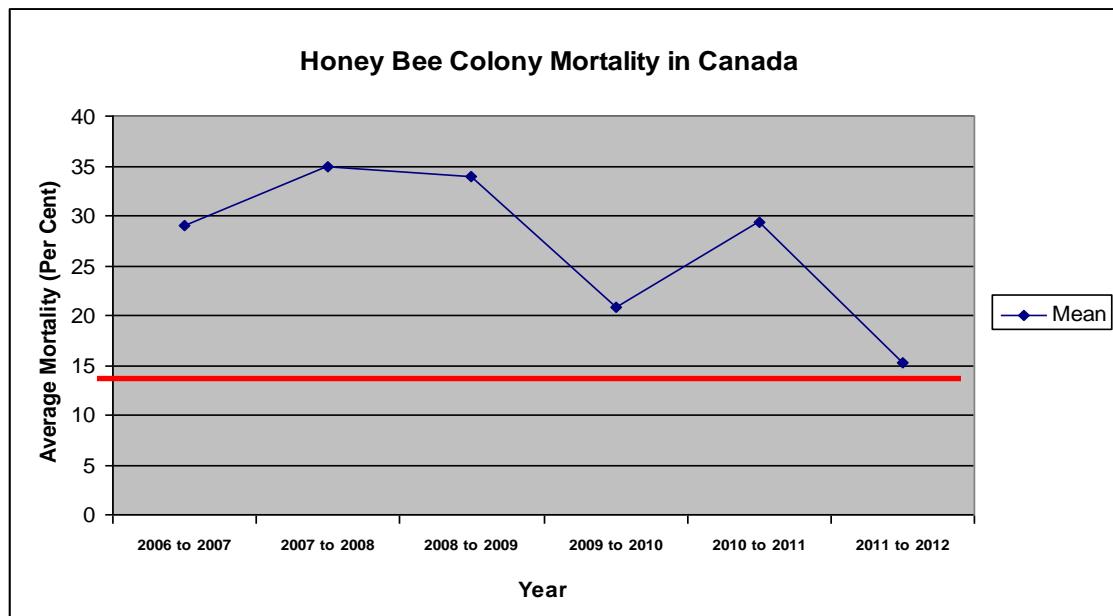
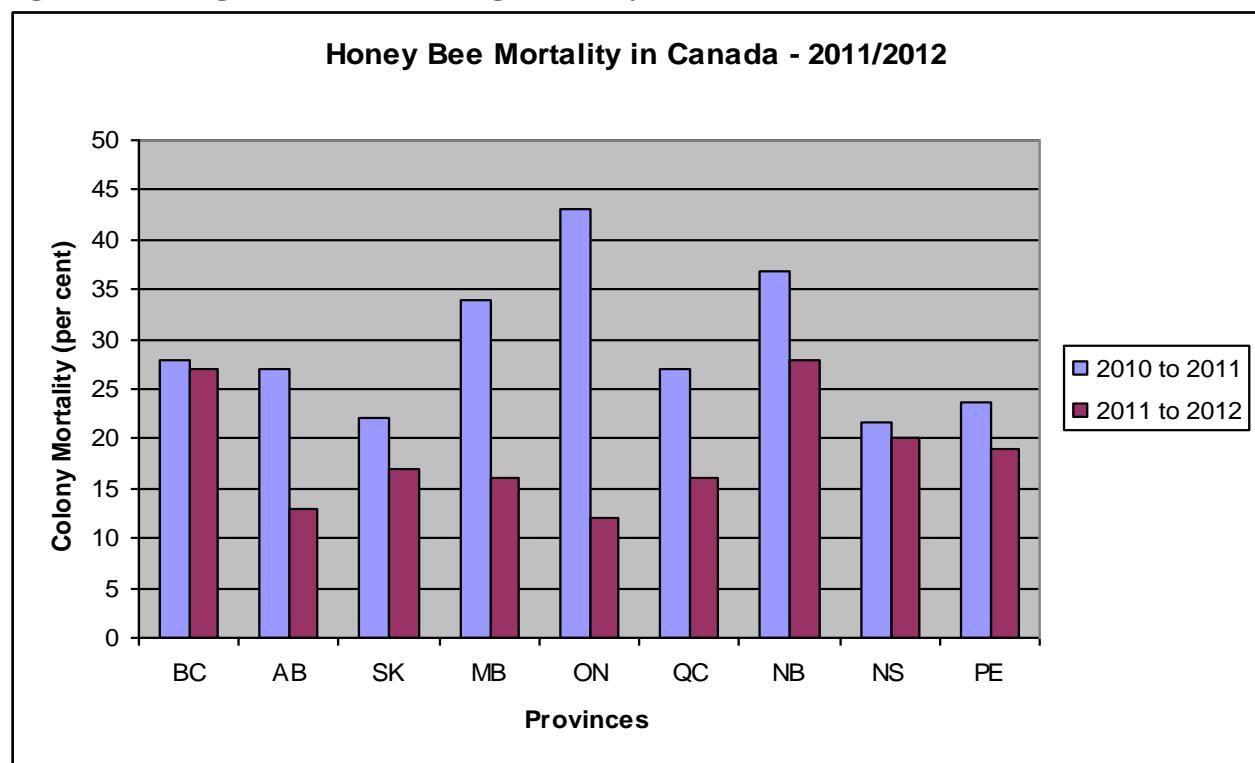


Figure 2. Average Percent Wintering Losses by Province 2011 & 2012



References:

Guzman-Novoa E., Eccles L., Calvete Y., McGowan J., Kelly P. and Correa-Benitez A. 2010. *Varroa destructor* is the main culprit for death and reduced populations of overwintered honey bees in Ontario, Canada. *Apidologie*. 4 (4): 443-451.