


ATTTA
Atlantic Tech Transfer Team
*for Apiculture*

# NOSEMA NEWS FROM THE ATLANTIC TECH TRANSFER TEAM FOR APICULTURE (ATTTA)

## INVESTIGATING THE INCIDENCE OF NOSEMA IN HONEY BEES USED FOR WILD BLUEBERRY POLLINATION AND REGIONAL NOSEMA TRENDS

**By Jillian Shaw**

Honey bees serve critical ecological and economic roles as pollinators in Canada and are a key part of Canada's agricultural sector. Honey bees are social insects living in high density populations that often contain 50,000- 80,000 individuals per hive. They are constantly encountering each other as a method of communication, but this can be an easy way for disease to spread too.

*Nosema spp.*, a microsporidian parasite, is well-known to beekeepers around the world. Two species of *Nosema* are known to infect European honey bees: *Nosema apis* and *Nosema ceranae*. The Canadian Association of Professional Apiculturists (CAPA) conducts an annual national colony loss survey and nearly every year, *Nosema* is identified as a reason for colony loss. *Nosema* spores are transmitted from honey bee to honey bee via fecal matter ingestion. This can happen when bees have eaten contaminated food from contaminated comb or by trophallaxis as bees exchange regurgitated stomach matter. Nosemosis can cause dysentery, increased wintering loss, poor spring build-up, heightened queen supersedure rate, and a reduction in honey production, bee lifespan, bee population, and brood food production.

*Nosema apis* was once thought to be the only species affecting European honey bees for many years, but researchers are now realising that *N. ceranae* was most likely present in European honey bees for much longer than previously documented. *Nosema apis* was also thought to be the dominant species of *Nosema* but through research, this assumption is being continually challenged as *N. ceranae* is becoming more and more prevalent in sampled bee populations.

Honey bee colonies are moved among various locations during wild blueberry pollination season. Transportation of hives to pollination is considered a stressor to bee health. When bees are exposed to stressful conditions such as prolonged confinement and insufficient food, bee health may be compromised. *Nosema* is commonly promoted by stressful circumstances.

For beekeepers to best manage honey bee colonies and promote optimal bee health during pollination, research is needed on *Nosema* spore loads, species identification, and seasonal trends in Canada. Research is also needed to determine if there is any relationship between wild blueberry pollination and *Nosema* spore loads. The two main objectives of this project are to 1) Observe the impact, if any, of placing colonies in wild blueberry fields on presence and abundance of *Nosema* spore loads in honey bees and to 2) Measure the seasonal *Nosema* species prevalence and trends in honey bee colonies throughout the Maritime provinces from April until September.

CANADIAN AGRICULTURAL PARTNERSHIP
Innovate. Grow. Prosper.
NOVA SCOTIA
New Brunswick Nouveau
Prince Edward Island
Canada

**Funders and Contributors:**

Bleuets NB Blueberries
New Brunswick Beekeepers Association Inc.
Nova Scotia Beekeepers' Association
Wild Blueberry Producers' Association of Nova Scotia
Prince Edward Island Wild Blueberry Growers Association
PEI Beekeepers' Association

Sampling will be carried out in 14 apiaries across the 3 Maritime provinces: New Brunswick, Nova Scotia, and Prince Edward Island. Within each apiary, 12 hives will be labeled and used for continuous sampling. Five apiaries will be used as a "control" treatment and hives within these apiaries will be used for honey production. The other 9 apiaries will have its hives sent to wild blueberry pollination and will be used as a "pollination" treatment. Bee samples will be collected from each hive every month and *Nosema* spores will be quantified. Bee samples will also be sent to the National Bee Diagnostic Center in Beaverlodge, Alberta for *Nosema* species identification (*N. apis* or *N. ceranae*).

With this information we will be able to study *Nosema* trends and determine if sending colonies to pollination has any effect on *Nosema* spore loads. We can then use this information to make best management practices (BMPs) recommendations to optimize bee health and still build the pollination capacity of honey bees for wild blueberry pollination, core mandates of the ATTTA program. A final report will be completed in Fall 2020, and research results will be shared with industry partners at upcoming bee and blueberry meetings, and through ATTTA's website.

Due to COVID-19 restrictions, farm visits to the participating apiaries will be limited. We thank the participating beekeepers who were willing to change this project to citizen-science based, where beekeepers collect samples and send them to our lab in Truro. We appreciate the many beekeepers willing to collaborate in this way!

---

Jillian Shaw is entering her fourth year at the Dalhousie University Faculty of Agriculture in Truro, Nova Scotia. She is completing her Bachelor of Science degree, with a major in plant science. This is Jillian's second summer working with honey bees through ATTTA. Jillian's research team also includes co-supervisors Dr. Paul Manning and Dr. Chris Cutler (Dalhousie University), and Dr. Robyn McCallum (Program Lead for ATTTA).

Funding for this project is provided by the Sobey Agricultural Undergraduate Research Award (awarded to J. Shaw) as well as the multiple partners that fund the Atlantic Tech Transfer Team for Apiculture (ATTTA): the provincial governments of New Brunswick, Nova Scotia, and Prince Edward Island through the Pan Atlantic Research and Innovation Program through the Canadian Agricultural Partnership, and industry partners including Bleuets NB Blueberries, New Brunswick Beekeepers Association, Nova Scotia Beekeepers Association, Wild Blueberry Producers' Association of Nova Scotia, Prince Edward Island Wild Blueberry Growers Association, Prince Edward Island Beekeepers Association.