

# APHIS National Honey Bee Survey

## *Apiary Health Assessment Report*

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**Beekeeper ID:** AK-01-2019**Sample collected:** June 17, 2019**Latitude, longitude:** 61.559678 -149.289136

Thank you for volunteering to participate the 2019-2020 APHIS National Honey Bee Survey (NHBS). Your results help monitor honey bee health nationwide, providing an early warning system for invasive pests and pathogens, and furthering scientific research on honey bee diseases. For more information about protocol or the pests and pathogens in this report, visit: [beeinformed.org](https://beeinformed.org) (<https://beeinformed.org/>) or the USDA-ARS website [link \(https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/honey-bees/honeybees\)](https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/honey-bees/honeybees).

Any results not included in this report will arrive in a separate report. This report includes:

 **Colony Visual Field Inspection:**

- Queen status
- In-hive pests
- Overt disease symptoms

 **Lab diagnostics:**

- *Tropilaelaps* mite presence
- *Varroa destructor* mite load
- Microscopy *Nosema* spore load

 **Molecular diagnostics:**

- Viral
- Bacteria
- Molecular *Nosema*

 **Pesticides:**

- AMS wax pesticide results

# APHIS National Honey Bee Survey

## Colony Visual Field Inspection Results

**Table 1:** Visual Field Inspection Results

Your Value	Observation	Notes
22	Colonies in Apiary	Total number of colonies in the sampled apiary
8	Sampled colonies	Total number of colonies inspected and sampled
8 of 8	Queen right	Colonies where the queen was either observed or eggs were present, indicating queen activity within 3 days of the inspection
0 of 8	Colonies with queen cells	Colonies where the colony is producing queens, indicating requeening or swarm activity
0 of 8	Queenless	Colonies where no queen was observed and no eggs were present
0 of 8	Drone laying queen	Colonies where the brood was all or mostly drone brood, indicating the possibility of a drone laying queen
0 of 8	American Foulbrood	A brood disease with symptoms of dark unsealed or perforated, sunken capping and ropey dead larvae
0 of 8	European Foulbrood	A brood disease with symptoms of patchy, uncapped brood and 'melted' appearance in cell. Symptoms are accompanied by a distinct ammonia odor
0 of 8	Sacbrood	A brood disease with symptoms of discolored, upturned larvae in a banana-like shape
0 of 8	Chalkbrood	A brood disease with symptoms of white and moldy hard larvae found in the cell, on the hive floor, or in front of the hive
0 of 8	Parasitic Mite Syndrome	Colonies with spotty brood pattern, chewed down brood (sometimes discolored), <i>Varroa</i> present on open brood
0 of 8	Deformed wing symptoms	Bees were observed with deformed wings, symptomatic of <i>Varroa</i> spread viruses like Deformed Wing Virus and <i>Varroa Destructor</i> Virus
0 of 8	Colonies with Black Shiny Bees	Bees were observed with hair loss, appearing black and shiny. Could be indicative of a paralysis virus
0 of 8	Colonies with Small Hive Beetles	Colonies infested with small hive beetle adults and/or larvae
0 of 8	Colonies with Wax Moth	Colonies infected with wax moth adults and/or larvae

The table above displays the results of the visual in-field inspection of your 8 sampled colonies. Each entry indicates an aspect of your colonies' health, including either queen status or pest or disease status. Only pests or diseases detectable from a visual field inspection are included. The number in the "Your Value" column indicates the number of your inspected colonies that exhibit indicators of the targeted observations. These counts range from 0-8, with the exception of the number of colonies in your apiary that may exceed 8.

# APHIS National Honey Bee Survey

## Lab Diagnostic Results

**Table 2:** Pest Results

Your Value	Pest	Notes
1234	Sample size (# of bees)	Total number of bees in alcohol sample
4	Total <i>Varroa</i> mites counted	Total number of <i>Varroa</i> mites counted in entire sample.
0.3	<i>Varroa</i> load (mites per 100 bees)	A frequently occurring external parasite that reproduces in brood cells and vectors viruses
0.1	<i>Nosema</i> load (millions of spores per bee)	<i>Nosema</i> spore count is determined by microscopy; <i>Nosema</i> is a unicellular gut parasite that produces spores
-	<i>Apis cerana</i>	Asian honey bee that can be an invasive pest. They are not known to be in the U.S.
-	<i>Tropilaelaps</i> spp. mites	<i>Tropilaelaps</i> mites are parasitic mites native to Asia. They are not known to be in the U.S.

The table above indicates the results of your colonies' in-lab microscopic and visual inspections conducted at the University of Maryland. This report summarizes the alcohol sample size, the *Varroa* mite count, the *Nosema* spore load, and any *Apis cerana* and *Tropilaelaps* spp. mites found. *Varroa* mite counts that exceed 3 mites per 100 bees are thought to cause damage, and colonies exceeding this threshold should be treated to reduce mite loads as soon as possible. *Nosema* spore counts in excess of 1 million spores per bee are thought to cause damage, and colonies with infection levels above this threshold should be considered for treatment depending on the season. For the most updated seasonal threshold monitoring and treatment options, see: [honeybeehealthcoalition.org](https://honeybeehealthcoalition.org/) (<https://honeybeehealthcoalition.org/>).

# APHIS National Honey Bee Survey

## Molecular Diagnostics Results

**Table 3:** Molecular Pathogen Results

Pathogen	Notes	Present (+) Not detected (-)	Pathogen target copies	Your Percentile
Acute Bee Paralysis Virus (ABPV)	Rare, horizontal transmission, <b>Varroa parasitism</b> Trembling, inability to fly, darkening and hair loss on thorax and abdomen	-	0	0
Black Queen Cell Virus (BQCV)	Very common, horizontal transmission, <b>Varroa parasitism</b> Dead queen larvae sealed in queen cells with darkened walls	n/a	n/a	
Chronic Bee Paralysis Virus (CBPV)	Rare, horizontal transmission Trembling, inability to fly, bloated abdomens, black hairless bees	-	0	0
Deformed Wing Virus (DWV)	Very common, horizontal and vertical transmission, <b>Varroa parasitism</b> Deformed wings in emergent bees	-	0	0
Israeli Acute Paralysis Virus (IAPV)	Rare, horizontal transmission, <b>Varroa parasitism</b> Trembling, inability to fly, darkening and hair loss on thorax and abdomen	-	0	0
Kashmir Bee Virus (KBV)	Very rare, horizontal transmission, <b>Varroa parasitism</b> Weakened colonies, no obvious visual signs	-	0	0
Slow Paralysis Virus (SBPV)	Not known to be in the U.S.	-	0	0
Lake Sinai Virus-2 (LSV-2)	Common, horizontal and vertical transmission, <b>Varroa parasitism</b> Weakened colonies, no obvious visual signs	+	16.8 million	20
Varroa Destructor Virus (VDV)	Very common, newly discovered recombinant of DWV Deformed wings in emergent bees	+	32.2 million	33
Moku Virus (MKV)	Extremely rare, newly discovered in honey bees and closely related to SBPV	-	0	0
<i>Nosema ceranae</i>	Common, widespread, unicellular gut parasite that causes <i>Nosema</i> disease	+	1.1 billion	22
<i>Nosema apis</i>	Very rare, used to be common but is believed to have been out competed by <i>Nosema ceranae</i> , also caused <i>Nosema</i> disease			

The table above indicates which pathogens are present in your apiary in terms of percentiles. The following page indicates the same information visually. **These percentiles allow you to compare your apiary values to national values.** The smaller your number and percentile, the better. Higher percentile values in the column "Your Percentile" represent higher pathogen or viral loads (higher counts of the pathogen or virus) than compared to other samples where that pathogen or virus was present.

Samples without the virus or pathogen are not included in the calculation. A 'n/a' in this table means the pathogen was not tested for this year. Individual detections of a particular virus or pest may not be indicative of a problem, but will help in our understanding of national disease and pest trends. Honey bee viruses are very common, and no treatments are currently available.

**Terms defined:**

- Horizontal transmission = Disease transmission between susceptible individuals of the same generation (i.e., worker to worker)
- Vertical transmission = Disease transmission between susceptible individuals across generations (i.e., queen to offspring)
- *Varroa* parasitism = Virus associated with the presence of *Varroa* and believed to be transmitted by the parasite

# APHIS National Honey Bee Survey

## Putting your results in perspective

### LAB DIAGNOSTICS:

This section aims to help you put your pest and pathogen results in the national context. Based on analysis of samples since Jan 01, 2018, *Varroa* mites were present in **86%** of samples. *Nosema* spores were present in **51%** of samples (microscopy analysis only).

Figure 1: Your *Varroa* load results compared to national averages

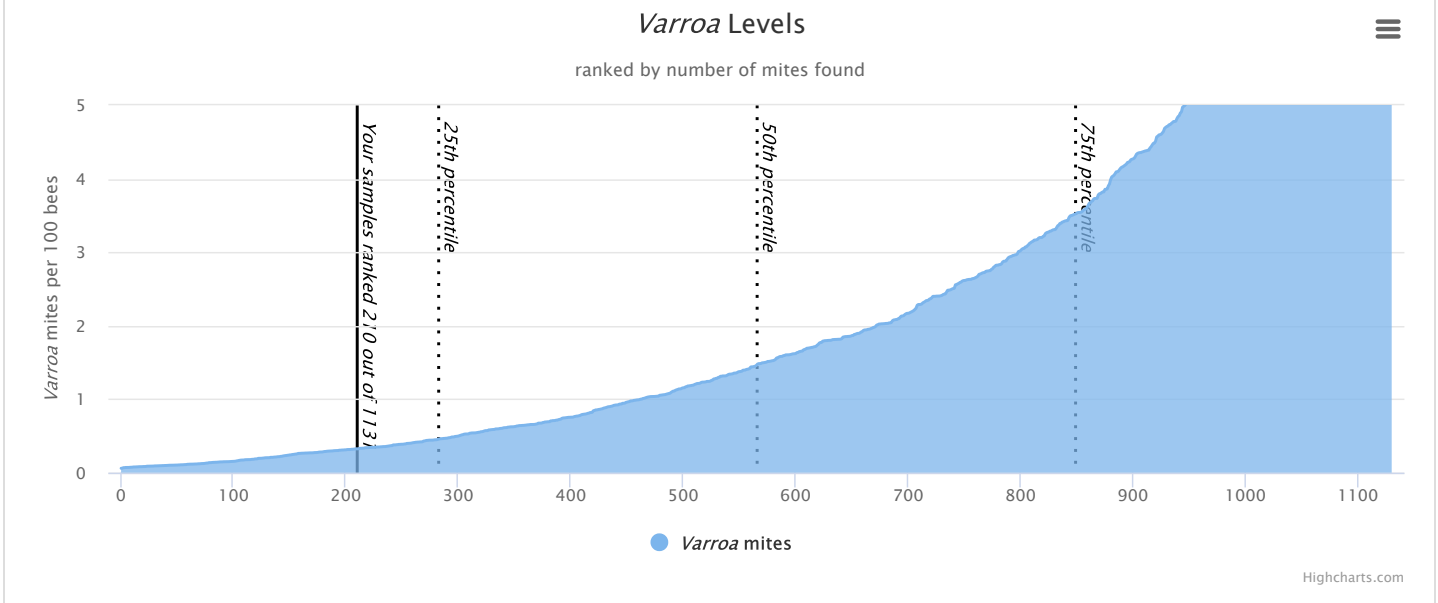
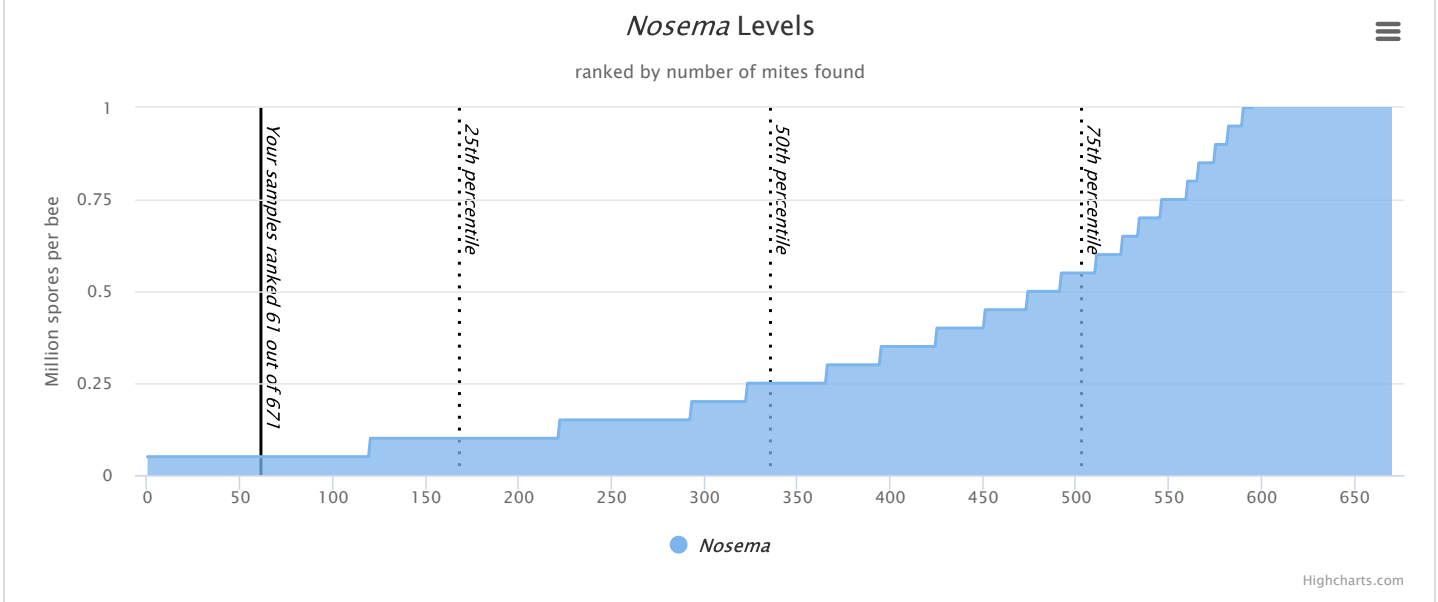
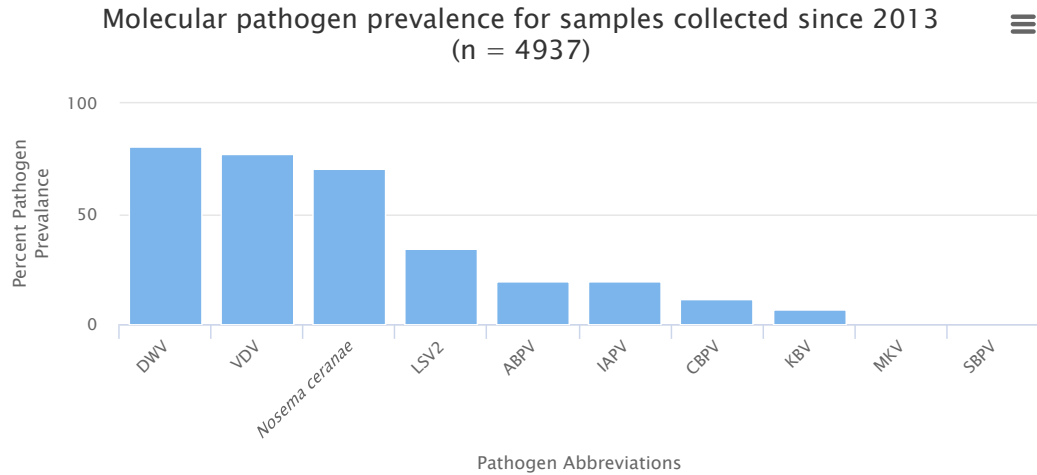


Figure 2: Your *Nosema* load results compared to national averages



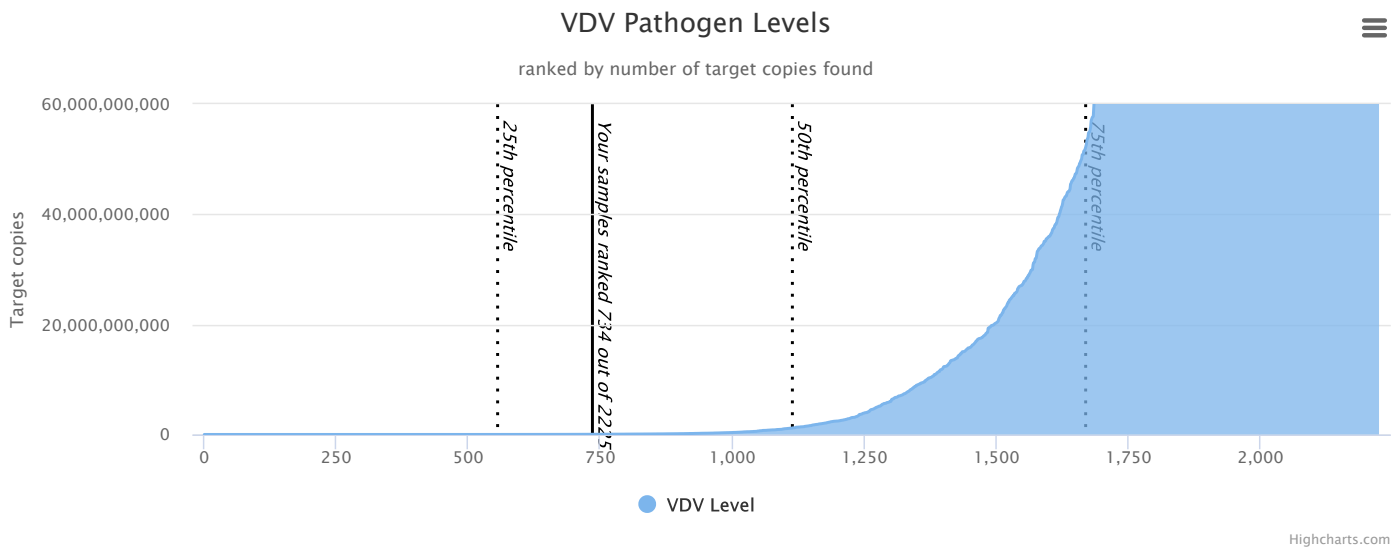
MOLECULAR DIAGNOSTICS:

Figure 3: Pathogen prevalence nationally



The figure above indicates sample results inclusive of all data collected from Jan 01, 2013 to present. It illustrates the percentage (prevalence) of the samples that tested positive for the indicated molecular pathogen out of 4937 samples.

Your VDV load results compared to national averages



Your LSV2 load results compared to national averages

