Bee Informed Partnership: Sentinel Apiary Program
Final Report 2019

Dear Sentinel Participant,

Thank you for participating with us in the 2019 Sentinel Apiary Program! This year, 2,221 samples were taken from 461 colonies in 85 apiaries! The program continues to grow each year, and we are so excited about the progress we have made, and for what we will continue to do in the future.

Exciting things that are in store for 2020 are:

- Results on Varroa treatment efficacy. We are working on summarizing which treatments, combinations of treatments, and treatment timings work best so we can provide even better management recommendations to you. We expect to share these findings this year.

- A new mobile app that will allow Sentinel participants to enter data on their phones. The app is being designed to work as a management tool for you, to help you keep track of your colony health and management all year. It will also streamline the data entry and report generation processes, so you will get faster results and have everything all in one spot right on your phone.

- A continuation of our partnership with the American Beekeeping Federation. In 2019, we launched a sponsorship program with ABF, who generously provides $100 off a Sentinel kit for ABF members. We are pleased to continue this partnership in 2020. If you are an ABF member, please let us know so we can provide you with this year's promo code for online registration.

This report is a summary of the *Varroa*, *Nosema*, and colony management information we collected in 2019. In general, Varroa and Nosema pressure were more intense this year than last year. We hope that continued sampling helped you combat these pressures effectively to result in successful overwintering.

We would like to emphasize what a pleasure it is to work with all of you. We feel incredibly fortunate to have such involved stakeholders who are so passionate about keeping healthy colonies and contributing to science. The data you provide is entirely unique and very important to investigating colony health and management practices. We hope you enjoy this report and keep on the lookout for more updates about the program and future studies!

Thank you again for your participation.
Happy Beekeeping,
The Bee Informed Partnership Team

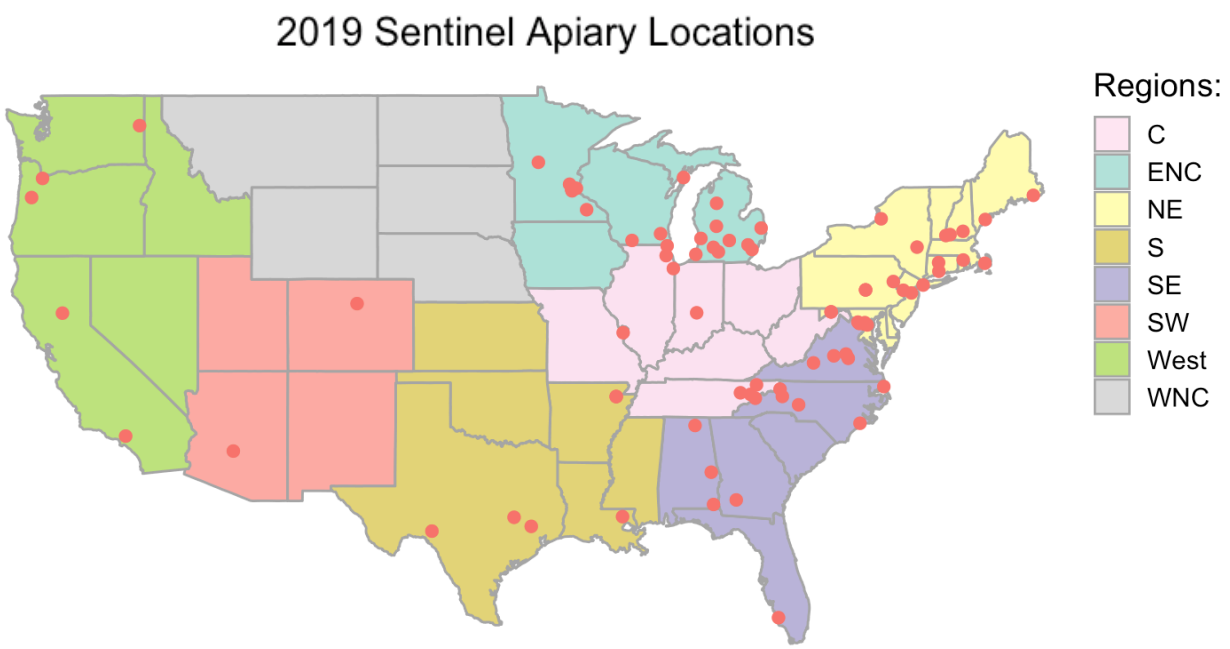
Kelly Kulhanek

Dan Reynolds

Participant Demographics

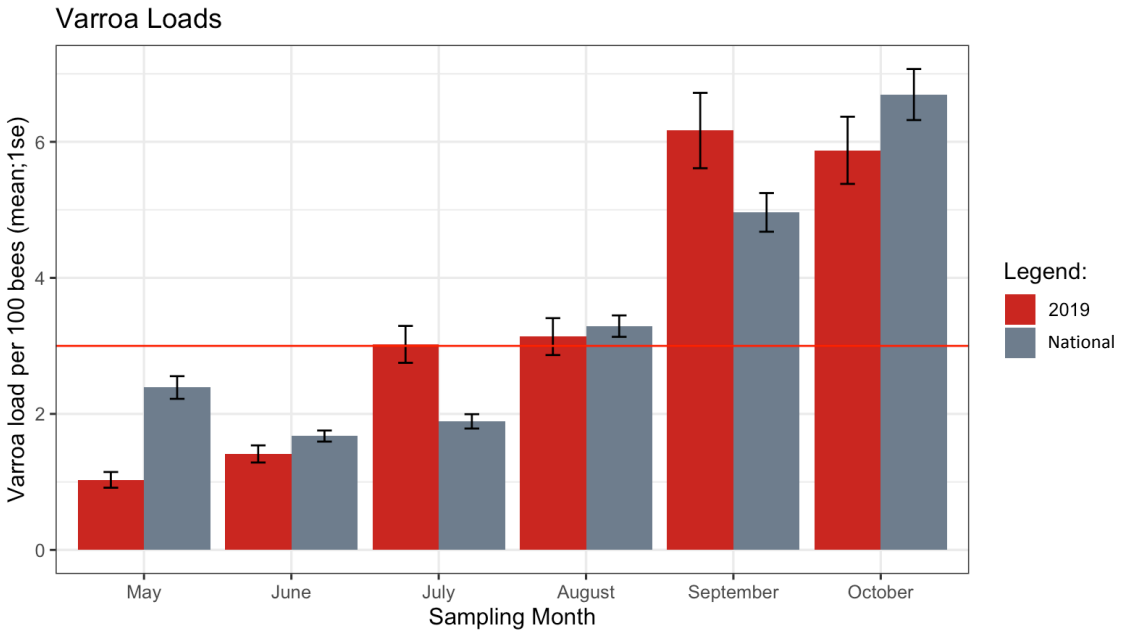
This is a breakdown of partcipation rates by number of apiaries, colonies, and samples. We divide the US into NOAA's 8 regions, or climate zones, because mortality and management are more comparable within these regions. This year, we received samples from every climate zone except the West North Central zone.

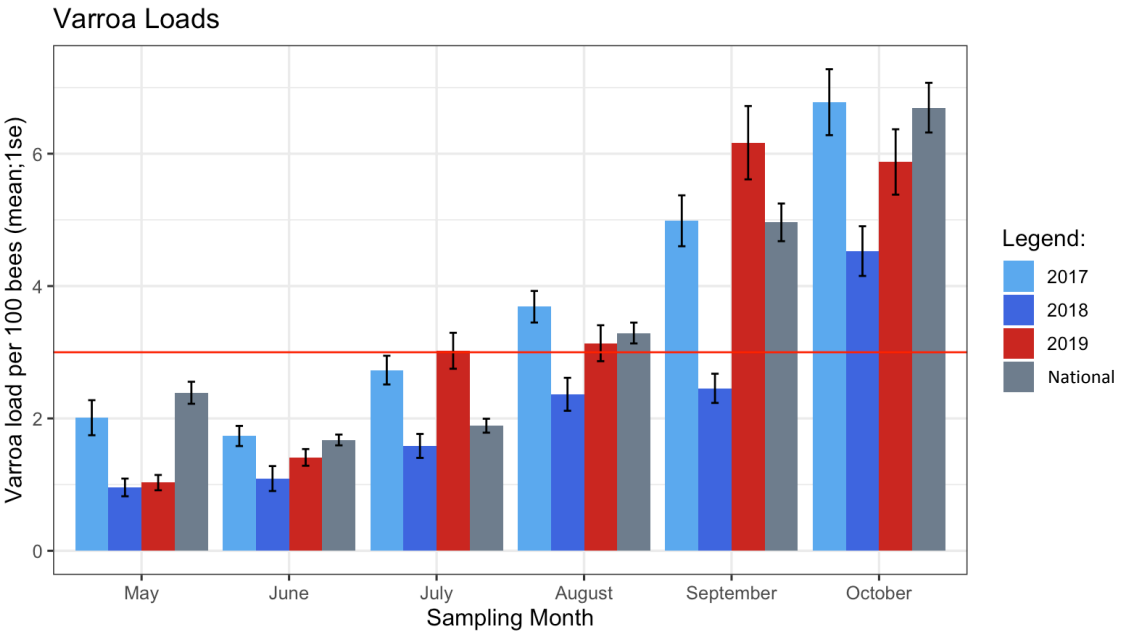
Region:	Central	East North Cental	North East	South	South East	South West	West	TOTAL:
Apiaries	11	23	24	6	14	2	5	85
Colonies	55	126	131	27	75	13	34	461
Samples	275	633	674	92	343	71	133	2,221



Varroa Summary

Each year we calculate the average Varroa load (mites/100 bees) for all Sentinel Apiary Program participants. We compare these monthly averages to the Historical National Average (calculated from all USDA-APHIS samples). Last year, in 2018, Sentinel Apiaries had lower Varroa loads than the National average each month. Unfortunately we did not see that trend again this year. Sentinel Apiaries in 2019 exceeded National average Varroa loads in July and September, but we do see a decrease in mites in October. We hope this was a result of your sampling efforts enabling timely mite management for Sentinel participants!

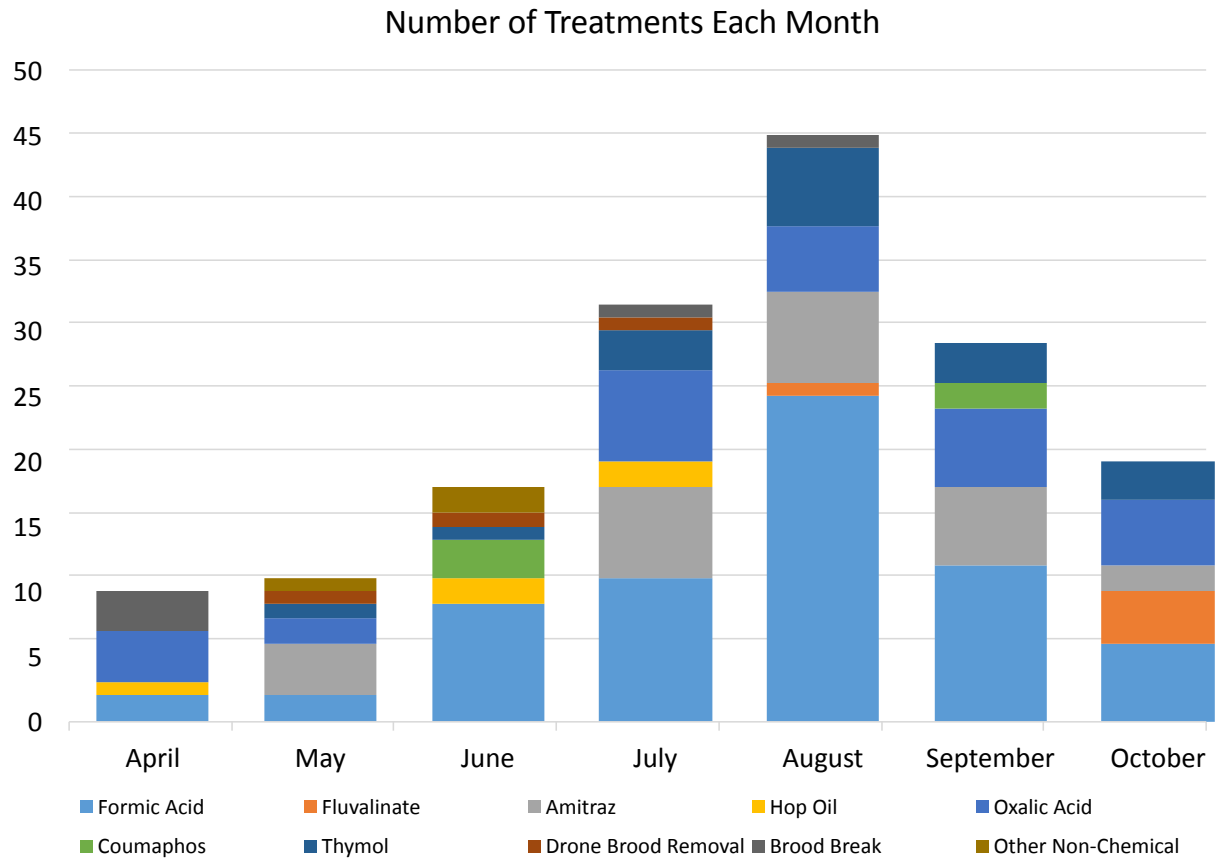




Varroa Treatment

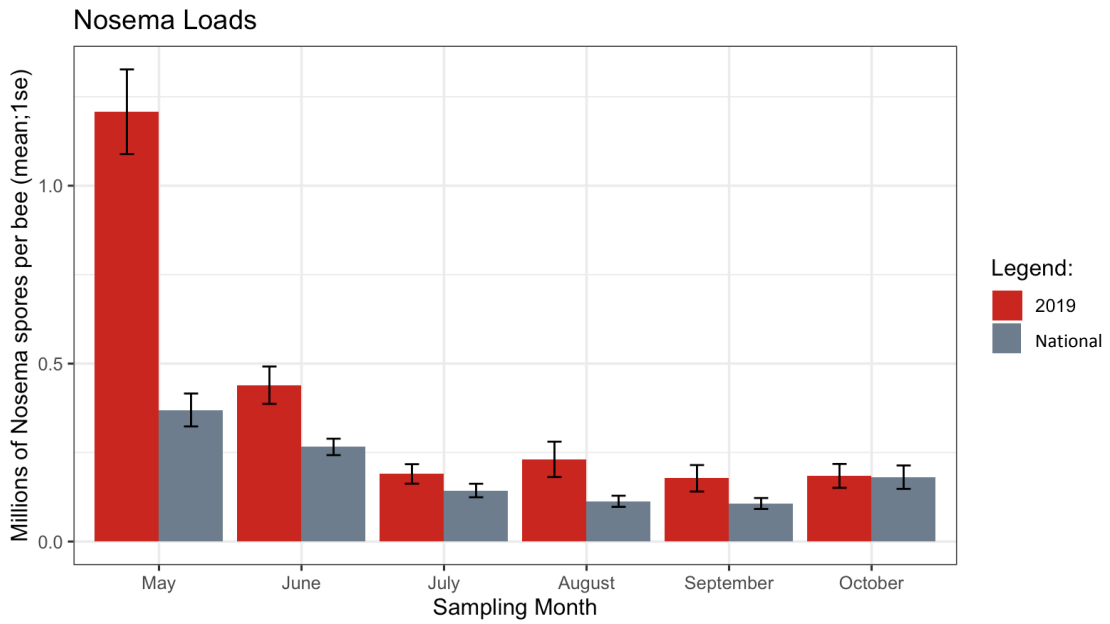
This page describes the patterns in Varroa treatments used by Sentinel participants over the season. The table below shows the number of reported uses of each active ingredient. The following graph depicts how the frequency of use Varroa control methods changes over time, and is further broken down into active ingredient. You can see that August was the most popular month to treat, and Formic Acid was the most common treatment used, followed by Amitraz. Brood breaks and drone brood removal were the most common non-chemical treatments. The next step is to evaluate treatment efficacy. Stay tuned for results coming out this spring!

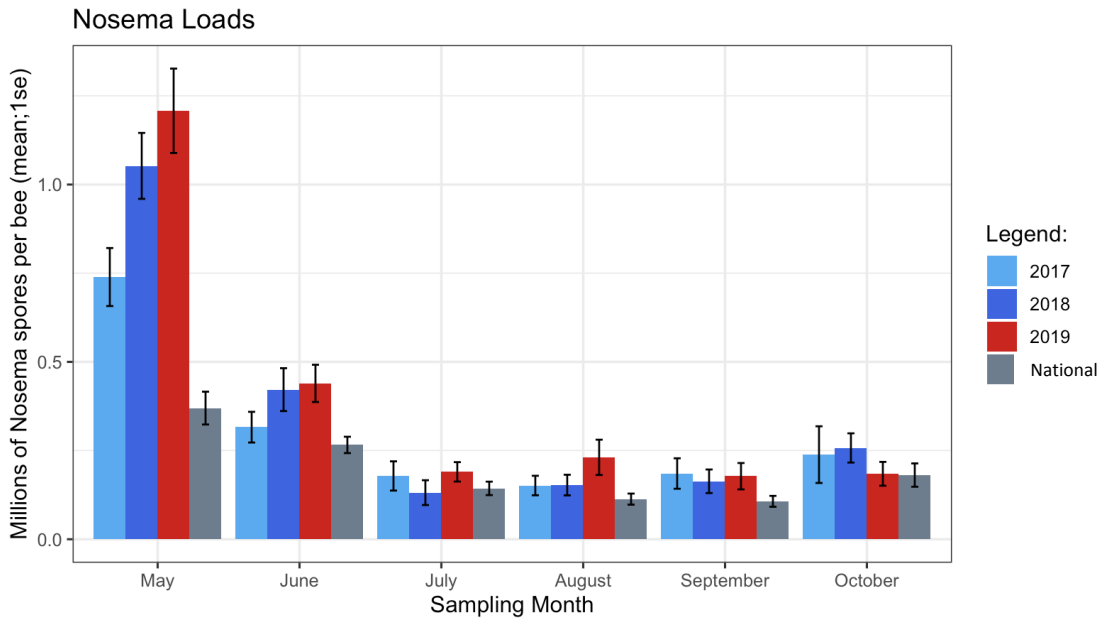
	April	May	June	July	August	September	October
Formic Acid	2	2	9	11	25	12	6
Fluvalinate	0	0	0	0	1	0	4
Amitraz	0	4	0	7	7	6	2
Hop Oil	1	0	2	2	0	0	0
Oxalic Acid	4	2	0	7	5	6	5
Coumaphos	0	0	3	0	0	2	0
Thymol	0	1	1	3	6	3	3
Drone Brood Removal	0	1	1	1	0	0	0
Brood Break	3	0	0	1	1	0	0
Other Non-Chemical	0	1	2	0	0	0	0



Nosema Summary

This page summarizes 2019 Sentinel Participant average Nosema loads compared to the Historical National Average and to prior Sentinel years. Each year Sentinel participants start with significantly higher Nosema loads than the National average, but these levels rapidly decrease as the season progresses. Our recommendation for how to handle Nosema is usually to just wait it out! In healthy colonies it usually clears up on it's own as your colonies grow during honey flows.





Causes of Loss

On each monthly data sheet, we ask Sentinel participants whether they lost any colonies and if so, why. This page summarizes the responses of beekeepers regarding their perceived causes of colony loss. You can see that Queen Failure was the most comonly reported cause of loss (30 reports), followed by Varroa (24 reports). Happily, no losses were reported as being due to pesticide exposure, Nosema, CCD, or natural disasters.