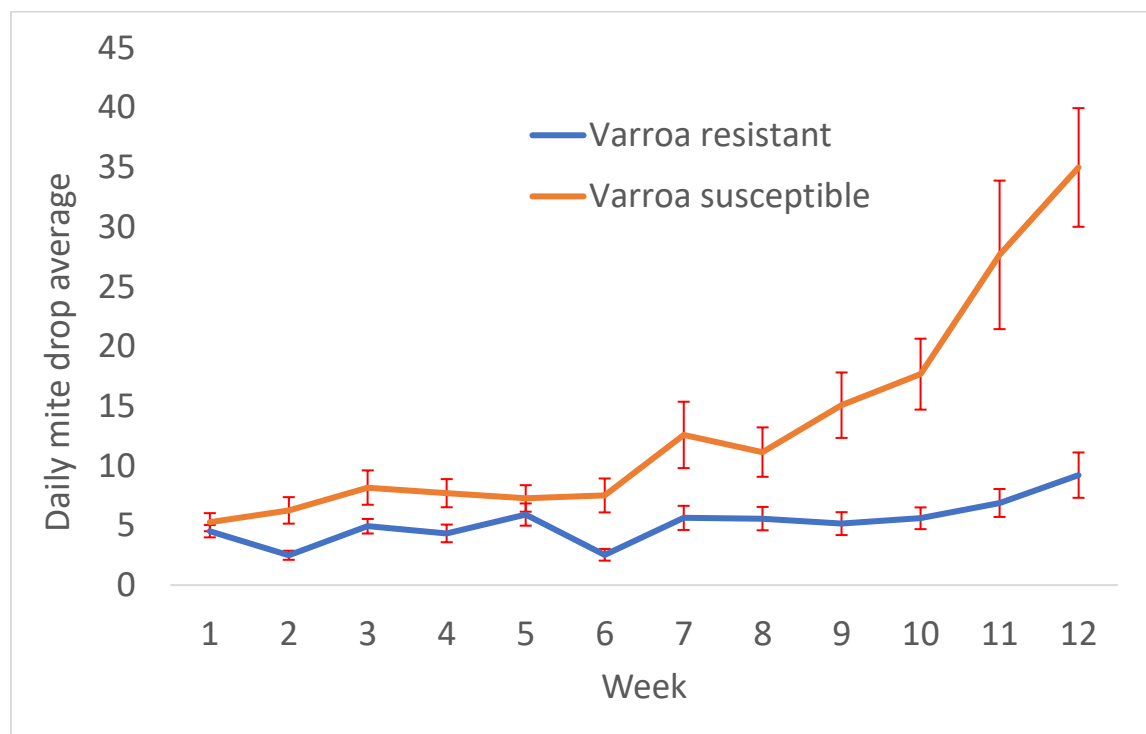


Varroa resistant bees are resistant all summer: The account of one researcher invested in sustainable beekeeping

By Melissa Oddie

“It was hard work, counting mites once every week from trays set out under fifty colonies for the entire summer. It took one full day to count mite for all the colonies and I was working through rain, wind and flocks of very curious sheep, but that work paid off at the end of the year when the results were pulled in from the field.” - Melissa

Varroa mites have long been a big problem for beekeepers, but some brave individuals have begun to develop bee stocks that can combat this pesky parasite without the need for treatment. The study was aimed at comparing the varroa-resistant bees of one Terje Reinersten, a local beekeeper and bee breeder, who has been working with his own stock for about 40 years, to a stock of Carnica bees that have always received regular varroa mite treatments. No treatments were given starting from when the colonies were first established in July 2019. The study lasted from the end of May to the end of August, 2020 and the bees were watched very carefully. The poor Carnica bees (in orange on the graph) could not cope, and their mite levels rose with the season, as was expected. We have seen this pattern in many studies before. Terje’s bees (in blue) seemed to do just fine without intervention, and it appears they have the ability to regulate mite levels all throughout spring and summer. The Carnica bees had to be treated at the end of the study or risk high losses.



A graph presenting the average mite fall counts for 2 different apiaries each week of the summer, the varroa-resistant bees (blue) and a Carnica stock (orange) treated regularly every year, up until fall of 2018.

Of course more research is needed to find out why these varroa-resistant bees are so good at what they do, but we do know, from previous studies, that these varroa-resistant bees can reduce how many mite babies a mother mite can have. This suppressed mite reproduction (SMR) likely plays a big role in the patterns we are seeing. This is the first time a season-long mite population study has been performed on varroa-resistant bees to obtain a real-time comparison for both colony groups in the same type of environment. The apiaries were located about 6 km from each other, with no other known apiaries nearby. The lines depicted here are the average mite falls for the entire apiaries, about twenty-five colonies in each group, with the red lines being the error margin for the averages. Some of the varroa-resistant colonies did have fairly high levels, about twenty per day in some cases towards the end of the study, but it was always only one or two colonies, whereas in the Carnica population, the instances of these high counts were much more common.



Picture of Melissa Oddie working in the field.

Photo credit: Anita Reinertsen.

On the other hand, there were some Carnica colonies that were able to keep mite levels low, but there were not many of them. This tells us that even populations that have been treated for so long might have the potential to become varroa resistant if they are given the chance. Of

course, any attempts to breed resistance must be done responsibly: by treating colonies with high mite loads and replacing the queen in that colony with a queen that might do better next year. Not regulating mites in your apiary could lead to mite spread that no colony could overcome, with or without resistance, and it would be bad for the neighbouring bees too. We are coming closer to understanding just how bees can overcome new threats like varroa so quickly. Apart from mite fall data, brood samples were also taken both to track the number of babies mother mites are producing in these two honeybee groups, and to record rates of a special behaviour that has been linked to varroa-resistant colonies: cell recapping. This study is part of a much larger project dedicated to reducing varroa damage to commercial honeybees in Norway. The results found this year are a great addition to a very interesting path of discovery, one that will hopefully lead to healthier bees for everyone long into the future.