



HONEY BEE STUDY

Prallethrin

Understanding the impact of our Prallethrin products on honey bees.



In 2022, Thermacell Repellents funded research by Dr. Roger Schürch and Dr. Margaret Couvillon, from Virginia Polytechnic Institute and State University, on the impact of the Thermacell Prallethrin mat on honey bees flying in the treated area.

Do Thermacell Prallethrin products kill honey bees or otherwise affect their behavior?

“No. We ran 3 trials evaluating the effect of the Prallethrin mat on honey bees feeding in the mosquito control treatment area both during and after the Prallethrin exposure period. There was no honey bee mortality in the Prallethrin-treated plots or in the untreated controls and there was no statistically significant difference in feeding or hive behavior between treated and control bees. **In this study, honey bees were unaffected by exposure to the Thermacell Prallethrin product.**” – Dr. John Hainze, VP of Science & Research at Thermacell

[VIEW DATA](#)

The Test

Methodology:

Three individual glass-walled observation hives were used in this study, with two feeders set up 100 meters from the hives. After training 20 honey bees to forage from and recruit new visitors to the test feeders, 141 individual bees were subsequently observed for their foraging activity. Each hive was trained to either visit a treatment feeder (inside the Thermacell product’s zone of mosquito protection) or a control feeder (no active Thermacell product). The foraging activity from individuals visiting from a control feeder was compared to the activity of individuals visiting from the feeder inside the zone of mosquito protection from a Thermacell product. The bees in both colonies were also observed 24 hours later to determine if there were any residual effects from the Thermacell product exposure. This was tested over 3 separate days of trials with the hives changing each time.

Study Location:



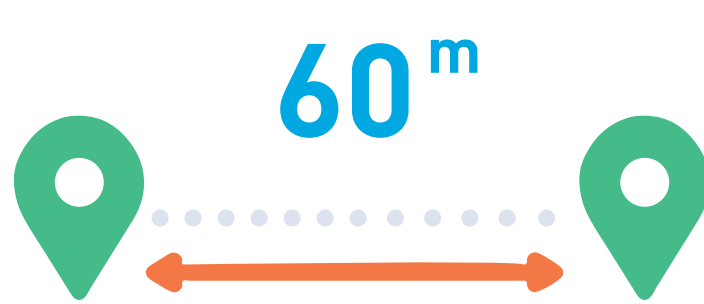
Prices Fork Research Station
(Blacksburg, Virginia)

Species Assessed:



Honey Bees
(141 observed across 3 hives)

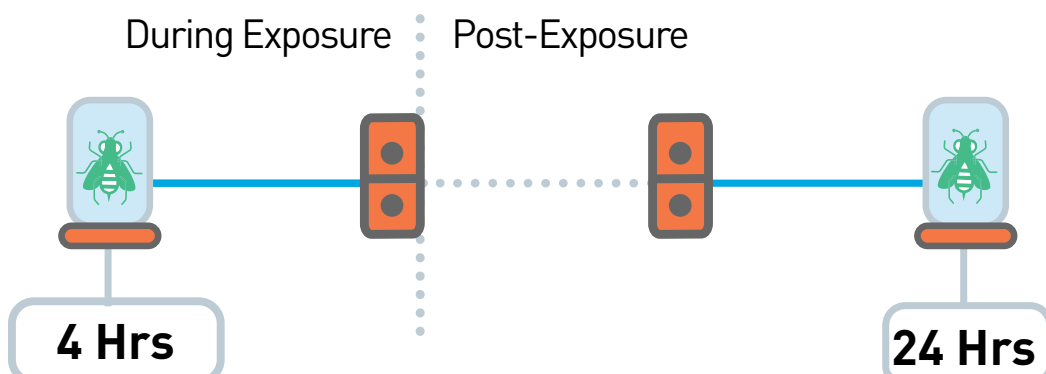
Testing Range:



Feeders were set up 60 meters apart and 100 meters from the hives.

Exposure Assessment:

Honey bee behavior was assessed during a four-hour period during which they visited a feeder exposed to the Thermacell product, and at 24 hours after exposure. A total of 24 hours of continuous video footage was taken, resulting in up to 8 hours of footage per bee.



Untreated Control Plot

Thermacell device set-up with an untreated mat inside to confirm that Prallethrin exposure responses could be accurately estimated

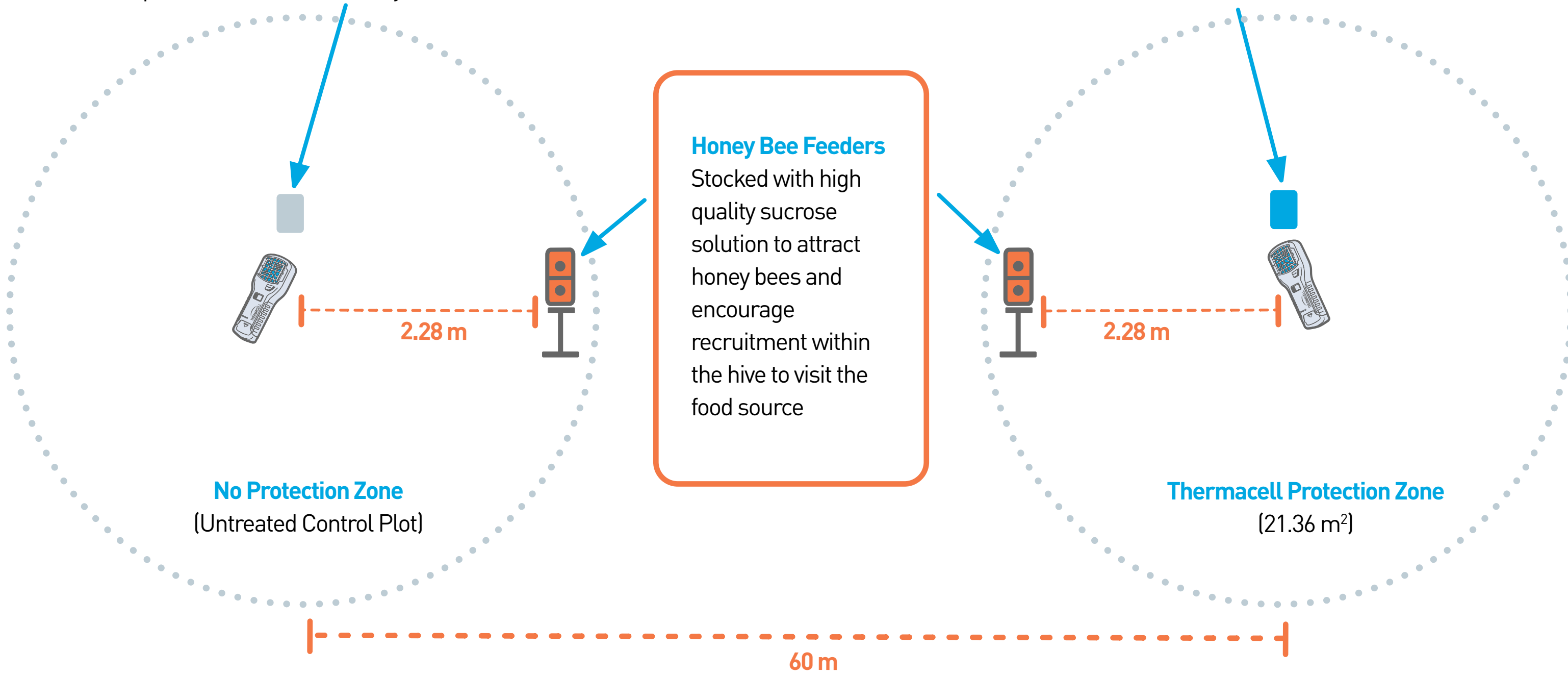
Aerial Station View:

Honey Bee Feeders

Stocked with high quality sucrose solution to attract honey bees and encourage recruitment within the hive to visit the food source

Treated Testing Plot

Prallethrin Mat Weight: 1.7 g
Active Ingredient Dose: 0.185 g
(10.86% w/w)



What is the “Waggle Dance”?



This is a form of communication that honey bees use within the hive to inform their nestmates about high quality food sources and how to find them. They code these messages using specific movements and sounds to recruit more members of the hive to visit the food source. This practice is key to the hive’s survival.*

THE RESULTS

Conclusion:

Over 3 separate trials, there were no significant differences in honey bee behavior between feeders near a Thermacell device heating a prallethrin-treated mat and a control device heating an untreated mat. There was also no honey bee mortality in the Prallethrin-treated protection zone. The data suggests that the product will not affect honey bees foraging in the area where the product is used.



There was no statistically significant difference in visitation during the experimental period when the devices were activated. There was no statistically significant difference in propensity to waggle dance between control and treatment. There was no statistically significant difference in feeder visits 24 hours after the experimental phase when the treatments were applied.

This indicates that there is no significant impact on honey bee populations flying or foraging in the mosquito control zone while operating a Thermacell device using Prallethrin.

* Source: Dong S, Lin T, Nieh JC, Tan K. Social signal learning of the waggle dance in honey bees. Science. 2023 Mar 10;379(6636):1015-1018. doi: 10.1126/science.ade1702. Epub 2023 Mar 9. PMID: 36893231.

Couvillon, M., Ohlinger, B., Bizon, C., Johnson, L., McHenry, L., McMillan, B., & Schürch, R., A volatilized pyrethroid insecticide from a mosquito repelling device does not impact honey bee foraging and recruitment., Virginia Polytechnic Institute and State University, (Manuscript in progress)