Does applying the diamide insecticide Verdepryn to target plum curculio also affect tick populations?

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The optimum time for controlling nymphal deer ticks (*Ixodes scapularis*) is typically from mid-May through mid-June, before tick populations peak. During this window, ticks are in their nymphal stage, which is the most active and likely to feed on hosts, increasing the risk of transmitting diseases like Lyme disease. In apple orchards, this period coincides with the critical petal-fall application for managing plum curculio, a key pest of apples. The timing of the plum curculio spray can serve as a valuable opportunity for integrated tick management, especially since many insecticide applications targeting curculio may also impact tick populations.

Deer tick, *Ixodes scapularis*

Recently, there has been interest in newer, more selective insecticides that are both effective against pests like plum curculio and rainfast enough to offer extended protection against ticks, even after rainfall. The rainfast nature of Verdepryn, a diamide that has proven to be very effective at controlling plum curculio and other pests at petal fall, may enhance their efficacy in the field, ensuring continued protection against pests even after rainfall events.

Materials and Methods

This experiment was conducted on May 20, 2024, at the UMass Cold Spring Orchard. At petal fall, the insecticide Verdepryn (Cyclaniliprole) was applied to control plum curculio. Five twigs with leaves were collected from trees treated with Verdepryn, 5 hours after the application (REI = 4 hours). Five additional twigs were taken from untreated trees to serve as controls. To prevent desiccation, each twig was covered with a moist paper towel and wrapped in parafilm before being transported to the laboratory in a cooler.

A total of ten 16 oz Pro-Kal deli containers, with perforated lids to allow for aeration, were used for the experiment. These containers were divided into two groups: five received one twig with leaves from Verdepryn-treated trees, while the other five received twigs from untreated trees. Each container was stocked with 20 ticks—comprising a mix of males, females, and nymphs-provided by the UMass Tick Lab, Microbiology Department. Mortality of ticks was recorded at 12 and 24 hours post-application.

Twigs with leaves sprayed with Verdepryn were exposed to ticks in the laboratory.

Results

At the 12-hour mark, 62.4% of ticks in the containers with treated twigs had died, while no mortality was observed in the control group (unsprayed twigs). By 24 hours, tick mortality in the treated group had increased to 95.9% (Fig. 1), with no observable mortality in the control group.

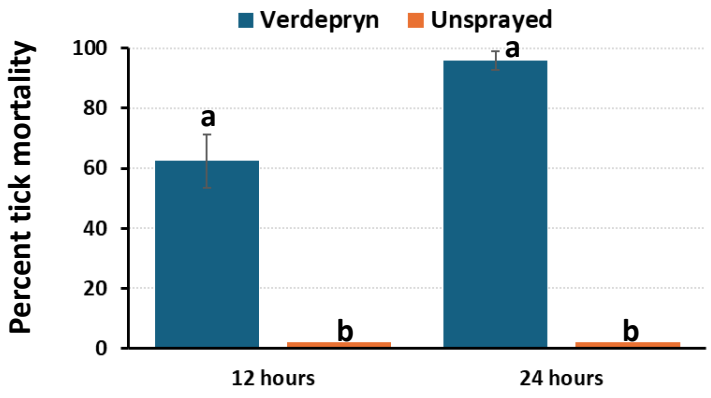

Figure 1. Tick mortality (adults and nymphs) at 12 and 24 hours post-exposure to Verdepryn-treated vs. untreated foliage. No mortality occurred in untreated groups. Treatment significantly increased mortality (odds 19:1).

Conclusion

The results suggest that Verdepryn insecticide can effectively help reduce tick populations on apple foliage, even though ticks are not the target pest of the treatment. The high mortality observed within 24 hours post-application indicates that Verdepryn, when applied for managing apple insect pests such as plum curculio, can also incidentally contribute to tick management in apple orchards.

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