

An Effective improved application method of HopGuard for Varroa Control in Canada

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Varroa destructor is a serious parasite of the Western honey bee *Apis mellifera*. Beekeepers extensively relied on synthetic miticides, primarily Apistan, Checkmite and Apivar to control this parasite. Because of resistance development to applied miticides, beekeepers are advised to utilize several tactics including mite tolerant bees, the use of organic acids and synthetic miticides in an integrated pest management system to manage varroa populations. In order to manage miticides' resistance and provide more tools to beekeepers for varroa control this study evaluated the efficacy of HopGuard for varroa control in Canada. Earlier trials showed the efficacy of one or two applications of HopGuard (one strip per 5 frames of bees) was approximately 40% (Vandervalk M. Sc. 2013). The current study expanded upon earlier trials by testing more applications and changing the substrate of HopGuard strips. In spring 2013 trials, HopGuard was applied 3 times at 5 day intervals at the same dose as described above, The estimated efficacy was 56.7% using Apivar as a finishing treatment. The HopGuard™ showed once again that it was effective right after application for 2-3 days, but quickly dried out and became ineffective after that time. In some cases dried strips were chewed out by bees.

The substrate of HopGuard strip was replaced with a corrugated cardboard strip to hold more material and prevent the strip from drying out as quickly. Consequently, the exposure period of bees to the hop material increased. This type of new strips was called HopGuard II and it is applied as one strip/5 frames of bees, similar to the original strip. HopGuard was tested in double brood chamber bee colonies. The efficacy for the following treatments was as follows; one application of HopGuard II, two applications at 10 day intervals, three applications at 10 day intervals, three applications of HopGuard at 5 day intervals and no treatment as a control was 80.0%±10.7%, 97.0±1.4, 98.5±0.7, 93.7±4.0 and 22.0±4.0, respectively (Fig. 1). Similar results were achieved when HopGuard was tested in single brood chamber bee colonies. The efficacy was 92.0%±5, 97.0 ± 13.3, and 92.3 ±4.1 for HopGuard II with one application, HopGuard II with 2 applications and HopGuard with 3 applications, respectively (Fig 2).

The results of this study show that the changing the strips to corrugated cardboard improved efficacy. A single application of one strip of HopGuard II will have an efficacy 80.0-92.0% against varroa mites. Moreover, these results show that HopGaurd II will become a useful effective miticide that will play a role in managing varroa in honey bees.

Fig 1. Average (\pm Stdv) Efficacy of HopGuard II in Two Brood Boxes Hives in Alberta, Canada, Fall 2014

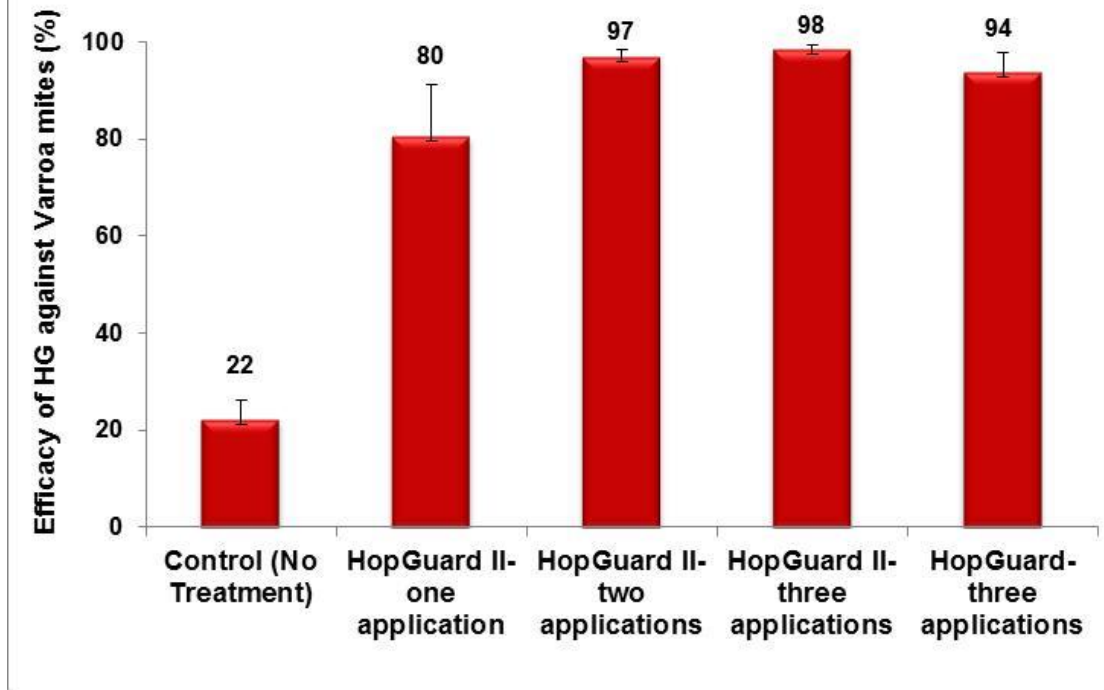


Fig. 2. Average (\pm Stdv) Efficacy of HopGuard II in Single Brood Boxes Hives in SK, Canada, Fall 2014

