INVESTIGATING THREE PAD MATERIALS WITH OXALIC ACID AND GLYCERIN FOR VARROA MITE CONTROL

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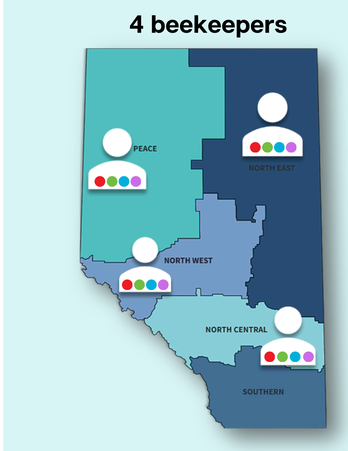
INTRODUCTION

Varroa mites cause significant harm to *Apis mellifera* health, acting as vectors for multiple honey bee diseases. Oxalic acid has gained attention as a potential mite control method. Current oxalic acid application methods are labour intensive and require precise timing to be effective. For this reason, slow-release Oxalic Acid/Glycerin strips are being explored as a new option for *Varroa* management. These include various DIY methods and a recently registered product called VarroxSan. However, these treatments have not yet been evaluated under Alberta's climatic conditions or tested in commercial beekeeping operations. The goals of this project were, 1. to create a Standard Working Procedure for handling and mixing oxalic acid and glycerin and, 2. compare three pad materials in delivering oxalic acid and glycerin as a slow-release treatment for *Varroa* mites.

METHODS



- For the DIY treatments, a 1:1 w/v solution was prepared and applied to the cellulose strips. An SOP was developed for mixing OA/Gly in large volumes.
- Once a month, from June to October, 10 colonies were randomly sampled from all 16 yards. *Varroa* mite washes were conducted in the laboratory on sampled colonies.

Table 1. Treatments concentration, number of strips per box, pad application method, number of colonies per yard, and application time with 3 staff.

Treatment	Concentration	# of Strips per Box	Pad Application	# of Colonies per Yard	Application Time (3 people)
SS	30-40 g	2	Top bar frames	32-40	1h15/40 hives
FP	30-40 g	3	Top bar frames	32-40	1h15/40 hives
VS	24 g	4	Between frames	30	1h30/30 hives
Control	N/A	N/A	N/A	32-40	N/A

DIY - Swedish Sponge (SS)

DIY - Filter Paper (FP)

Commercial Product - VarroxSan (VS)

PRELIMINARY RESULTS & DISCUSSION

- The initial assessment indicated that the control groups began with more medium-sized colonies than the treatment groups. This likely contributed to the lower initial mite levels in the controls and explains why it took longer for mite populations to build up and reach levels comparable to the treatments.
- The results showed that all Oxalic Acid/Glycerin treatments were effective for Beekeeper B, and the Swedish Sponge and Filter Paper methods worked well for Beekeeper C. Results for Beekeepers A and D were not statistically significant. However, the results showed floor effect because the mite counts started at low levels.
- In the fall, three beekeepers individually used Formic Pro, which quickly reduces *Varroa* during their dispersal and reproductive phases, possibly explaining the October mite drop. At the same time, beekeeper A did not use Formic Pro yet still saw the same October drop, suggesting a possible legacy effect, where treatment effects continue even after application.

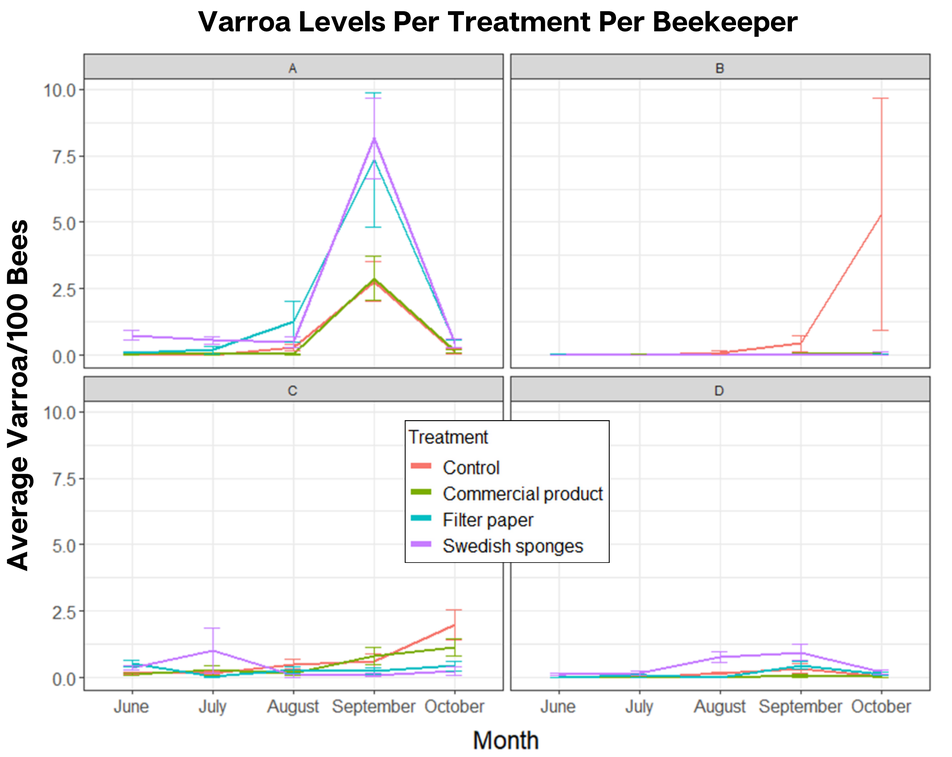


Figure 1. Graphs representing the average *Varroa* levels per 100 bees per treatment in each beekeeper throughout the season.

Conclusions

Oxalic acid/glycerin strips show potential as part of an IPM strategy, especially when combined with other treatments. However, effectiveness may vary by beekeeper practices and region. Further research is needed to understand how OA/Gly strips interact with other treatments.

Future Steps

- Titration analysis
- Viral analysis
- Honey Residue Analysis
- Overwintering Mortality

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