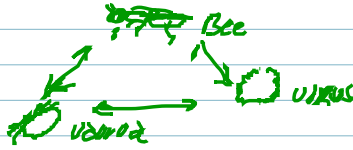


Adam Finklestein
VP Queen Bees
30 N. of D.C.

Oct 18, 2014
Bloomington, IL

Need for Varroa Resistance



Routes to Resistance

1. Stock selection, focusing on mite population growth \downarrow
2. Trait selection, focusing on mechanisms that regulate mite population
 - hygiene toward dead bees
 - grooming / mite fall
 - Reduce mite production - effects of adult bees
 - Reduce mite reproduction - effect of brood only
 - Reduce brood attractiveness

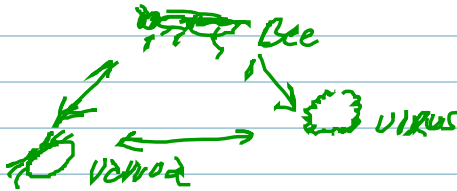
VSIt - General to specific

- All natural selection to yield survivors - Bond method
- Select for low mite populations
 - Russian honey bees
- Select for Traits

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USH - General to specific

- All natural selection to yield survivors Band method
- Select for low mite populations
 - Russian honey bees
- Select for Traits

- Primary trait; > hygiene removal of mite infected pupae
- Secondary, direct effect

USH - in Action - video
Purple eye

USH: Methods for Selection
Look for mite feces in cell before bee emerges
to check for loading
go through 100 cells
Simplest & Simple but time consuming

Little or no mite growth when:
 $\geq 75\%$ mites non reproductive
 $\geq 33\%$ mites do not oviposit
 $\geq 70\%$ mite infected pupae are removed i.o. l.u.c.

Local Breeder selection USH

Use what is practical:

- Alcohol wash
- Enables Breeder to quantify both mite load and mite population growth

Alcohol wash

- Most effective when performed over the course of the season. 3, 6.
- Av. of 3 gives a r.c. 4x

① Buckup ② honey flow ③ shut down

Total milk found \div total bees in sample $\times 100 =$ percentage of milk

Alcohol test is easy to perform

- less accurate

Practical Application

Italian \times USH = Pol-line hygienic Italian bees

Lamb honey?

Pol-line Selection

- Survival
- Large Population
- Low Inbreeding
- Honey Production

Localization Breeding Program

Use most suitable foundation

- Survival
- Hygienic
- USH expressing
- Appropriate Phenotypes

Localized Breeding Programs

- Positive results from 500 queens works
- Use common sense when crossing stock to work
- Follow the consistencies

Success finding all possible combinations is based on pop size

- Implement Performance Evaluation
measure characteristics
multiple measurements over time
tests available for PC
Accurate records necessary
Queen Marking - colony marking
 - Cull if not sure

Type of Resistant Strain

- Russian, USH, Survivor
- Verify Producer's Credibility
 - Don't be shy - Ask for References
- Work with a group

Best Queens Made with by you?
Follow the Biology
Work with a group

Breeder Queen - Q & A

Recording Keeping

Numbering

Year - Numbers - Letters

X = open mated