

IQI Oct 13, 2013

## Regional Directors

- Jeff Harris - Scientist for USDA Honey Bee Lab  
Breeding for mite resistance - USH

- Colony raising traits - measuring at the colony level  
Scale 1-5

- Index

Colony A	Colony B
Honey Production - 4	4
Spring Development - 5	2
Overwintering - 4	4
Defense Behavior - 4	7
Variance resistance - 2	5

$$\text{index} = ((4+5+4+4+2) \div 5) = 5 \quad \text{Colony A}$$
$$((4+2+4+7+5) \div 5) = 5.6 \quad \text{Colony B}$$

variance resistance

IQI Oct 17, 2013

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- Jeff Harris - Scientist for USDA Honey Bee Lab  
Breeding for mite resistance - VSH
- Colony raising traits - measuring at the colony level  
Scale 1-5

- Index

Colony A	Colony B
Honey Production - 4	4
Spring Buildup - 5	2
Overwintering - 4	4
Defense Behavior - 4	4
VSH & resistance - 2	5

$$\text{Index} = ((4+5+4+4+(3 \times 2)) \div 5) = 4.6 \text{ Colony A}$$
$$((4+2+4+4+(3 \times 5)) \div 5) = 5.8 \text{ Colony B}$$

VSH & RESISTANCE

## Breeding Objective

### Requirements for Success

- Heritable trait of the Bee
- Related to Mite Growth
- Measurable

## Forming Colonies

### Unitary Colonies

- Same Sex population
- Same mix
- Same Size
- Same no. of Mites

The Queen was the only variable

tested using Freeze kill

Short Term (1-week) response to,  $\text{var}_{\text{m}} - \text{not tested}$   
Dross

## Harbo Breeding Scheme

1. Goal to produce USA Breeders so that others can introduce traits to stock.

## Severe Culling for:

1. Poor Brood quality
2. Tendency to supercede queen
3. High defensive behaviour
4. Any other obvious disease susceptibility

## Harbo Measurement of VSH

### No Mite Treatment

Colonies Do not need to die - just don't breed from them

- select 5-10% as queen mothers of most resistant stock

- In unarmed colonies may have some resistance; treat them but use their drones

Varroa IPM

Mating

Larry Connor - Drone Saturation

Drone Saturation for Small Scale Operations  
Bee Culture, June pp. 32-35

How to measure traits

Honey Production

Spring Buildup

Defensive behavior

Brood quality

Mite Resistance

Queen longevity

• In Breeding

Sex Alleles

male workers?

check for inbreeding

- 150-200 Colonies as breeding base

Brook

Area Bee keepers

Lonnie Langley

Fred - Nicot system

\* Jeff Harris

Started with mites that started the slowest

How do VSH bees detect pupae with mites

they smell something in mite brood

Breeding Programs

Raise your own, from:

John Harbo, VP Queens, VP Queens  
or MSU distributors

or

Raise your own open mated queens