Managing Honey Bee Populations for Greater Honey Yield

April 2015
We’ll discuss

• Introduction

• A seasonal approach:
  – Fall
  – Spring: Varroa and stimulative feeding
  – Summer
  – Winter

• An alternative configuration
Honey Bees Hoard Honey

- The methods and techniques described in this program are intended to support this natural drive
- The more methods utilized, the greater the likelihood of producing large populations and honey production
- A seasonal approach is used to organize the methods
Biology of Honey Production

Nectar flow = major nectar producing plants bloom. Bees collect and store nectar converting it to honey. Winter stores for them, surplus for you.
Basic idea: be prepared to take advantage of available resources and bees’ hoarding instinct

Spring colony expands & prepares for the summer nectar flow

Fully expanded colony
Hive Populations and Honey Production per Bee

Farrar 1944
Bottom line: Going from single deep to double deep means triple number of bees available for honey production
Big diversity means big population

- Location – location – location
- Where you set up your colonies affects quantity and quality of the food they collect
We’ll discuss

• Introduction

• A seasonal approach:
  – Fall
  – Spring: Varroa and stimulative feeding
  – Summer
  – Winter

• An alternative configuration
Seasons are circular like a merry-go-round; you can jump in at any point.
A Seasonal Approach

• Fall
  – Make sure they are strong and healthy
  – Well provisioned going into winter
  – Re-queen?
Strong & Healthy Bees = Maximum Population = Maximum Honey Yield
If the ratio of mites to bees is high in the fall, the bees will suffer and so will honey production.
Beyond the economic threshold
Well provisioned and staying that way: unloading free loaders

WHEN DRONES ARE THROWN OUT IN THE FALL...

WELL, WE WON'T HAVE TO LISTEN TO "WHAT'S FOR DINNER?" ANYMORE...
Honey Stores

80-100 lbs

Hive
Fall is your last chance to feed syrup to the bees
When being fat is a Good Thing
Protein Substitute is Necessary to Make Fat Bees

Colony Strengths Day 88

- No supplement control
- Yeast
- Feedbee
- Homebrew
- BeePro
- MegaBee
- Natural pollen control
- M.L. "Bulk"
- UltraBee

Randy Oliver Scientific Beekeeping
A young queen is necessary for a strong population and honey production

“Young queens prevent swarming better than one year old queens and much better than two year old queens.”

George Imerie
What, you raise green bees!
I thought she was lying about her age!
## Fall Requeening

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing breaks brood cycle helps reduce pest problems</td>
<td>No honey flow = more irritable bees</td>
</tr>
<tr>
<td>Better mated</td>
<td>Hive more populous; harder to find old queen</td>
</tr>
<tr>
<td>Less expensive</td>
<td>More difficult to introduce</td>
</tr>
<tr>
<td>Faster population build up in later winter/early spring</td>
<td>Less time to assess queen’s performance</td>
</tr>
<tr>
<td>Better availability; no back log</td>
<td></td>
</tr>
</tbody>
</table>
Race and Honey Production

Source: Glenn Apiaries
“Carniolans are known for their explosive, early spring build-up at the first sign of pollen.”

Brother Adam

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Earlier morning forager</td>
<td>• Likely to swarm unless carefully managed (no room to expand)</td>
</tr>
<tr>
<td>• Forages on colder and wetter days than most other bees</td>
<td>• If pollen is scarce brood rearing greatly diminishes</td>
</tr>
<tr>
<td>• Overwinters well on small stores, as queen stops laying in the fall</td>
<td></td>
</tr>
<tr>
<td>• Explosive build up in early spring</td>
<td></td>
</tr>
<tr>
<td>• Exceptionally gentle and easy to work</td>
<td></td>
</tr>
<tr>
<td>• May interrupt brood rearing during times of drought</td>
<td></td>
</tr>
<tr>
<td>• Does not typically propolize heavily</td>
<td></td>
</tr>
<tr>
<td>• Creates less brace and burr comb</td>
<td></td>
</tr>
<tr>
<td>• Crosses well with other varieties</td>
<td></td>
</tr>
</tbody>
</table>
Pros

- Resistant to Varroa Mites
- Resistant to Tracheal Mite
- Quick Spring build up
- Winter tolerant

Cons

- Brood rearing is highly dependent on forage availability
- Increased tendency to swarm
- Tend to propolize
- More time needed to introduce to non-Russians

Note: Russians require different management; they are NOT for beginning beekeepers

Hubert Tubbs shared that his Russian hives produced 130-150 lbs of honey. This compares to approximately 84 lbs of honey for non-Russians.
Winter

Keep them dry and well provisioned
Stay on top of food stores
When do you need to feed?

Late Winter
Feeding
Bees’ reward for being good
Winter

Insulation Box
Insulation Box

Screen to hold hay in place

Screened ventilation holes
Spring
When you see Red Current blossoming,
it is time to ramp up your population management activity
A Seasonal Approach

• Spring
  – Control Varroa
  – Stimulative feeding
  – Balance population with growing room
  – Re-queen
  – Pyramiding
  – Reversing
  – Supering
Maintain Varroa below the economic threshold: Do a Varroa Count

1 + 1 = 2 Much

You MUST control Varroa mites!
Economic threshold

• Point at which the level of infestation is too high

• Various ways to determine this
  – Alcohol wash
  – Sugar shake
  – Collection board

– For more details go to www.scientificbeekeeping.com
Alcohol wash = Gold Standard
Goal = Less than 5%
Sugar Shake
24 hour natural drop
Does not give % of infectation

Screened bottom board
Collection board
Collection board for 24 hour natural drop

- Use hard plastic
- Draw a counting grid
- Spray with Pam
- Slip into slot in screened bottom board
- Frequency: monthly except winter
Notice the 8 legs
How are your mite numbers trending?
The trend is what is important

Early season (March)
Less than 10 mites on the collection board in a 24 hour period

Watch for false negatives
Varroa destructor
April Fools Day
Don’t be foolish. Start building your population now.
Don’t leave them searching for a stimulating meal!
Carbohydrate Feeding

• 1:1 sugar to water ratio with Honey Bee Healthy added
• Mimics the honey flow
• Workers feed queen more
• Queen responds by laying more eggs
Protein Feeding

• Simulates a pollen flow
• Insures that there is available protein for the colony
• Stimulates the bees to feed the queen more
• Queen responds by laying more eggs
Feed carbohydrate & protein simultaneously to build population BEFORE the nectar flow NOT ON the nectar flow
Once you start simulative feeding, you CAN NOT STOP
Your Balancing Act

Population

Swarming

Growing Room
When the balancing act is off balance
Wow! This hive is really congested or maybe it’s just my compound eyes.
Look at that swarm!

There goes our honey crop.
There goes the queen & your future honey
# Requeening: Swarm Prevention

## Spring Requeening

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller colonies</td>
<td>Interferes with spring build up</td>
</tr>
<tr>
<td>Less likely to swarm</td>
<td>Good mating early in season less likely</td>
</tr>
<tr>
<td>Easier to introduce</td>
<td>More competition to purchase queens</td>
</tr>
<tr>
<td>Vigorous egg layer = large population for nectar flow</td>
<td>Dependent on variable weather</td>
</tr>
<tr>
<td>Large population going into winter</td>
<td></td>
</tr>
<tr>
<td>Time to assess queen performance/replace if needed</td>
<td></td>
</tr>
</tbody>
</table>
Growing Room: Pyramiding
Going from 1 to 2 brood boxes

1. Make space in the center of the new brood box by removing about 3 empty frames.

2. Take less than half the brood from the original brood box & place in the space created in new brood box.

3. Center remaining brood frames in original brood box & fill the space created on the sides with frames (preferably drawn) removed from the new brood box.
Pyramiding after adding 2\textsuperscript{nd} brood box
Growing Room: Reversing starting with 2 brood boxes

BROOD

HONEY

Before reversing

Correct reversing

Incorrect reversing
Reverse Brood Boxes

Before

After
Supering

Start supering before the nectar flow

Anticipate...Manage colony population...timing!
Follow the 70% Rule*

When 1st brood box reaches 70%, add a second brood box

When the second brood box reaches 70%, add a honey super, etc

*60% rule for Russians
Drawn comb: worth its weight in gold
When you see the Blackberry blossom in early June, the nectar flow has started!
Nectar flow in Willamette Valley
A Seasonal Approach

• Summer
  – Don’t BUG
  – Checker boarding
  – Tools of the trade
  – Supering
  – Extract
Summer
Don’t BUG Us
When is too much honey not a good thing?

The idea behind **checker boarding** is to perforate the barrier of honey in the super above the brood area.
Checker Boarding

• Manages placement of stored honey
• Relieves congestion
• Helps control swarming
• Contributes to increased honey production
Honey Super

Before Checker Boarding

Brood

Honey & Brood

F = full frame
E = empty frame

Less Honey & Brood

After Checker Boarding

Brood
Comparative weight of full boxes

10 frame deep
10 frame medium
8 frame medium

Michael Bush
“Friends don’t let friends lift heavy supers”
Jim Fischer
Tools of the Honey Trade: Imerie Shim

Western

Imerie Shim

Dado Cut
Why the Imerie Shim?

• Provides upper entrance(s) to the hive. This makes it possible for foragers to gain access to the supers without having to cross a queen excluder (if used).

• Upper entrance(s) relieves congestion not only on the landing board but also in the brood area. It provides the field bees a more direct route to the honey area where the nectar is ripened and stored.

• Improved ventilation making it easier for the bees to vent the hive of the moisture produced from ripening honey.
Imerie Shim Placement
Do NOT place Imerie shim directly above the brood box!
Continue to follow the 70% Rule*
When the second brood box reaches 70%, add a honey super, and keep it up during the nectar flow

*60% rule for the Russians

Do NOT disturb the brood chamber during the nectar flow!
STOP!
Hold that super

Some medications must be removed before adding a honey super to the hive
Now this is successful supering!
Extract honey by August 1st

- Remove supers
- Put boxes in hot dry room
- Uncap both sides of frame
- Spin honey out with extractor
80 - 100 lbs honey for bees

Surplus for beekeeper
What is honey?
What is honey? 
Bees convert nectar....

- **chemically** into nectar sugars glucose & fructose
- **physically** into thick consistency with water evaporation

\[
\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_6\text{H}_{12}\text{O}_6
\]

Enzyme invertase chemically converts nectar sugars

Nectar

invertase

Honey

Enzyme invertase chemically converts nectar sugars

sucrose  +  water

C_{12}H_{22}O_{11} + H_2O

C_6H_{12}O_6 + C_6H_{12}O_6

invertase

Honey

Enzyme invertase chemically converts nectar sugars
We’ll discuss

• Introduction

• A seasonal approach:
  – Fall
  – Spring: Varroa and stimulative feeding
  – Summer
  – Winter

• An alternative configuration
The two queen hive: a configuration that maximizes honey production
Why a two queen hive?

- Two queens exist harmoniously in a single colony
- Workers have access to either brood box and honey supers
- If 1 queen dies, second queen remains in colony
- Each box has its own landing board
- MAXIMIZES HONEY PRODUCTION
Bottom line: Going from single deep to double deep means triple number of bees available for honey production.
“When 2 queens are better than 1”
Setting up a 2 queen hive

• Early May or fall, select a 2 brood box hive to be divided, remove the old queen, make the division and introduce a new queen to each division

• Separate the two brood boxes and place them adjacent to each other on the same footprint of the original hive

• Place a single queen excluder and at least one honey super over the center of the two brood chambers

• Cover the exposed halves of the brood chambers with half sized migratory covers

• Add the second brood box to each existing brood box as the population grows maintaining the queen excluder between the top brood boxes and the honey super(s).

• Add honey super(s) using the 70% rule
Coming full circle back to fall
Stored and Stacked
“James Bond” Method

LIVE and LET DIE

SPECIAL EDITION 007 Edition
Don’t Give Varroa a License to Kill!

Varroa destructor
Your Bee Hive
Any Place, USA

Restrictions
Untreated Hives

OREGON
Class K
License to Kill
00753276 Expires NOW
The result of maximizing honey production
“I have led you to the water now you must decide whether to drink or not.”

George Imerie
The End

Photo: Roger Ledbetter
Questions?