

## Common Queen Problems in Beekeeping

### Background

- ❖ Development time for queens is about 16 days.
- ❖ Newly emerged queens (virgin queens) must make mating flights before beginning egg laying.
- ❖ Sperm from mating is stored in queen's spermatheca.
  - ◆ Workers & queens result from fertilized eggs
  - ◆ Drones result from non-fertilized eggs..
- ❖ Time from queen emergence to egg laying is about two weeks. (Delay of mating flights due to weather may increase this time.)
- ❖ Time from start of queen rearing to laying queen is about 30 days.
- ❖ Pheromones from queen and brood suppress workers' urge to lay eggs.

### Common Queen Problems

- ❖ **Bad queen** (poor egg layer, spotty brood)
  - ◆ It happens, but not as often as some beekeepers believe.
  - ◆ Queens are often blamed for non-queen related problems (and are needlessly replaced.)
  - ◆ Increase in brood may be more related to numbers of bees in hive, varroa, frames available for brood rearing, and other factors.
- ❖ **Overly defensive bees**
  - ◆ Be careful about source of queens.
  - ◆ European queens can be mean too!
  - ◆ Genetics are only one factor in causing grumpy bees.
- ❖ **Susceptibility and resistance to disease or mites**
  - ◆ Remember - pure genetics are difficult to maintain.
- ❖ **Old queens**
  - ◆ Hives with young queens are less likely to swarm.
  - ◆ Bees are likely to replace older queens at some point.
  - ◆ Replace queens at 2-3 years old?
  - ◆ Queens are expensive.
  - ◆ Existing hives may be difficult to re-queen.
- ❖ **Queenless hives**
  - ◆ Can occur in any season, but are more common during and after swarming.
  - ◆ Can occur in existing hives, new hives from packages, new nucs, or newly captured swarms.
  - ◆ Watch for presence of eggs and/or brood whenever you open hives.
  - ◆ Most common cause of spring-fall hive loss. (Phil's opinion)
- ❖ **Apparent queenless hives**
  - ◆ Apparent queenless hives are colonies that "appear" to be queenless, but instead contain a viable queen (often a virgin or a recently mated queen that has not begun egg laying).
  - ◆ May also be colonies which have suspended brood rearing due to lack of nectar flow (common with some varieties of queens.)
  - ◆ Common after swarming, before the new queen starts to lay eggs.
  - ◆ Beekeepers often fail to spot these young queens, do not see eggs, and assume the hive is queenless.
- ❖ **Drone laying queens** (lacking sufficient sperm in their spermatheca to fertilize eggs)
  - ◆ Result – only drone pupae, no worker brood. Cannot produce new queens.
  - ◆ Occurs with old queens - stored sperm is exhausted.
  - ◆ Occurs with any age queen when insufficient mating results in a lack of stored sperm.
  - ◆ Be careful with early spring queens from south.

- ♦ Characterized by drones in worker cells.
- ♦ Laying pattern is constant, good brood pattern, with only one egg per cell.
- ♦ Queen is present.
- ♦ Solution – replace the queen.
- ❖ **Laying workers**
  - ♦ Result of hives becoming “hopelessly” queenless - queenless for a long period of time (about 4 weeks after loss of queen.)
  - ♦ Workers cannot mate, but can lay eggs. The urge to lay eggs is usually suppressed by queen pheromones and pheromones from brood.
  - ♦ They produce only drone brood.
  - ♦ Characterized by:
    - Drones in worker cells
    - Multiple eggs in cells
    - Scattered brood
    - Absence of queen.
  - ♦ Very difficult to re-queen laying worker colonies – must combine with queenright hive or nuc.
- ❖ **Supersedure of queens**
  - ♦ Supersedure is a natural process in which a colony replaces an old or failing queen.
  - ♦ Disease in queen can be a reason supersedure occurs (send samples for nosema testing.)
  - ♦ Normally, after new queen emerges and mates, mother and daughter queens co-exist.
  - ♦ At some point, the old queen disappears, perhaps killed by workers
  - ♦ Are we seeing early or more frequent replacement of queens?
    - Soon after installation, including with package bees?
    - Is this a new or increased problem?
    - Queen quality problem? (too little time in mating nucs?)
    - Could be disease related – nosema.
    - Consider the choice of your source of queens.

## **Suggestions to reduce impact of queen problems**

- ❖ **TIMELY recognition of problems** is the most important step towards a solution.
- ❖ **Keep an eye on your hives for eggs or larvae.**
- ❖ **Maintain nucs for queen replacement.**
- ❖ **Add capped brood.**
  - ♦ Always a good idea if having queen problems and brood production has been reduced.
  - ♦ Adding capped brood to queenless hives will help prevent development of laying workers.
  - ♦ Adding capped brood will also boost bee population in the hive and help the colony accept the new queen.
  - ♦ It adds young bees to the hive.
  - ♦ Add frames with brood starting to emerge, if possible.
  - ♦ Buy, or ask friends for frames of brood if you have none.
- ❖ **Re-queening of hives**
  - ♦ Re-queening hives is the ultimate solution to most queen problems.
  - ♦ Phil suggests re-queening with a mated queen.
    - Rearing a queen from eggs will take as long as FOUR weeks to produce a laying queen.
    - Using capped queen cells will still take two weeks (or more) to a laying queen.
  - ♦ Re-queening of strong existing hives, queenless hives, and laying worker hives is often difficult.
  - ♦ Re-queen with nucs if possible.
  - ♦ Laying worker hives **MUST** be re-queened by combining with a nuc or an existing hive!