

Understanding Bee Math

Below is a chart outlining the lifecycle of honeybees:

Caste	Hatch	Cap	Emerge	Days
Queen	31/2 days	8 days +/-1	16 days +/-14 Laying	28
Worker	31/2 days	9 days +/-1	20 days +/-1 Foraging	42
Drone	31/2 days	10 days +/-1	24 days +/-1 Flying to DCA	38

Questions for Understanding the Table:

Q: If you find eggs and no queen, what is max time with no queen?

A: There was a queen present within 3 ½ days, and possibly still one now.

Q: If you find new, hatched larvae and open brood but no eggs, when was there a queen?

A: Four days.

Q: If you do a "walk away" split, how long before the queenless side of the split has a laying queen?

A: Workers will start with a just hatched larvae, so subtract 4 days from when the egg was laid, resulting in 12 days to a virgin queen. However, there is a lag of 1-2 weeks for fertilization flight to take place, and then another 1-2 weeks for colony acceptance of the newly mated queen to begin laying. Beekeepers should expect to see eggs in approximately 28 days.

Q: If you put an excluder between two boxes and come back in four days and find eggs in one and not the other, what do you know?

A: That the queen is in the box with eggs.

Q: If you find a capped queen cell, how long before it will emerge for sure?

A: 9 days, but probably eight.

Q: If you find a capped queen cell, how long before you expect to have a productive egg-laying queen?

A: The new queen will emerge in no more than 9 days, but then account for fertilization flight and colony acceptance delay, resulting in a laying queen at about day 21 from now.

Q: If you killed or lost a queen, how long before you'll have a virgin queen again?

A: 12 days, because the bees will start from a just hatched larva that is 4 days old. Remember to expect fertilization flight and colony acceptance delay (see above) before you have a laying queen at about day 21.

Q: If you start from newly hatched larvae and graft, how long before you need to transfer the larvae to a mating nuc?

A: 9-10 days.

Q: If you confine the queen, how long before you can begin grafting larvae?

A: Four days, because some won't have hatched at the beginning of day 3.

Q: If you confine the queen to get the larvae, how long before you have a laying queen?

A: about 28 days

Q: If a queen is killed and the bees raise a new one how much brood will be left the hive when the new queen starts to lay?

A: None. It will take 21+ days for the queen to begin laying. Any brood possible would be for drones.

Q: If the queen starts laying today how long before that brood will be foraging honey?

A: 42 days.

Q: If a hive just swarmed today, how long before you have a new queen?

A: Assuming this was the primary swarm, it usually leaves the day the first queen cell gets capped. This means that a new queen will emerge in 8 days. That queen may leave with another swarm, or the workers may allow her to kill any other queen cells (which are staggered in age) and stay. Remember that this is a virgin queen, so expect fertilization flight and colony acceptance delay (see above) before you have a laying queen. It is reasonable for the beekeeper to see a laying queen in about 18 to 21 days.

By now, it should be apparent that knowing how long things take helps predict what the beekeeper will see and when.

Sometimes you just have to figure best and worst case. For instance, an uncapped queen cell with larvae is between four and eight days old (from laying of the egg). A capped queen cell is between eight and sixteen days old. By looking at the tip of the cell you can tell one that is just capped (soft and white) from one that is about to emerge (brown and papery & often cleaned down to the cocoon by the workers). A soft white queen cell is between eight and twelve days old. A papery one is between thirteen and sixteen days old. The virgin queen will emerge at sixteen days, and the beekeeper should expect to see eggs in another 1-2 weeks.