

# Honey Bee

(*Apis mellifera*)



**Antennae** for feeling and smelling

**3 Ocelli** or simple eyes to detect light intensity

**Compound Eye** comprised of about 7,000 lenses

**Proboscis** or tongue for reaching nectar in blossoms

**Hypopharynx Glands** (internal) produce royal jelly, fed to all brood and exclusive diet of worker larvae destined to become new queens

**Honey Stomach** temporarily stores nectar for return trip to the hive

**Pollen Basket** stores pollen for return trip to the hive

**Stinger** barbs keep the sting embedded - fatal for the bee

**Wax Glands** between abdominal plates secrete wax for comb

## Pheromones

More than a dozen distinct pheromones are used by honey bees for everything from sounding an alarm to attracting drones to the queen mating sites.

Smokers used by bee keepers keep the bees calm by masking the alarm pheromone.



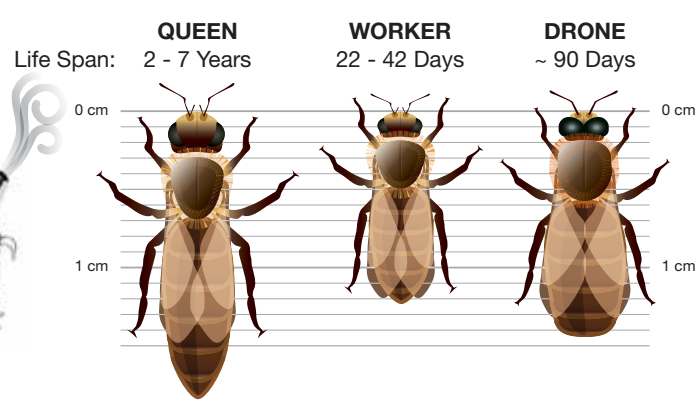
## Pollination

Pollination by honey bees is responsible for 1/3 of all agricultural crops globally. The FAO estimates the value of this contribution at US\$235 to US\$577 billion.

Some crops such as USA almonds (80% of global almond production) are 100% reliant on honey bees for pollination.



## Adult Members of the Hive



**Queens** can lay about 1,500 eggs a day during spring build-up - more than their body weight in eggs - daily.

She can control the sex of her eggs by selectively fertilizing them as they pass through her oviduct. Fertilized eggs hatch into female workers. Unfertilized eggs hatch into male drones.

Workers constantly tend her so she can focus on her sole purpose - reproduction.

**Workers** perform the daily tasks to maintain the hive. Their roles change as they mature. Young workers, or nurse bees, produce royal jelly which they feed to all larvae. Some worker larvae are fed exclusively on royal jelly which morphs them into new queens.

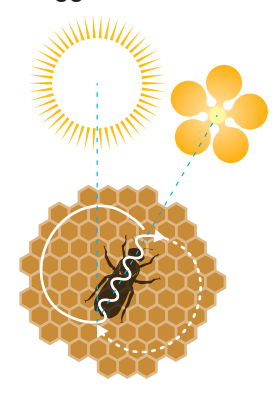
As the workers age their royal jelly production decreases and they take on other tasks - building comb; guarding the hive; then finally leaving the hive to scout and forage.

**Drones** do not forage, or defend the hive. They have no stingers. Their sole purpose is to mate with a virgin queen in mid-air. If they are successful the act of mating will be their last. Their ejaculation is literally explosive - blasting sperm through the queen's open stinger duct into her oviduct, tearing his penis from his body and launching him from her back.

The entire act takes a few seconds. The queen can mate with up to 19 drones.



## Waggle Dance



When scouts find a food source they return to the hive and perform a figure 8 'waggle dance'. The angle of the path they waggle along matches the angle of the path to the nectar from the hive in relation to the sun. The intensity of the 'waggle' conveys the magnitude of their discovery, and the number of waggles conveys the distance.

The scent of the nectar they return with also helps guide the foraging bees.