Honey Bees and Beekeeping 101

The Basics

Topics for Today

Why Honey Bees?

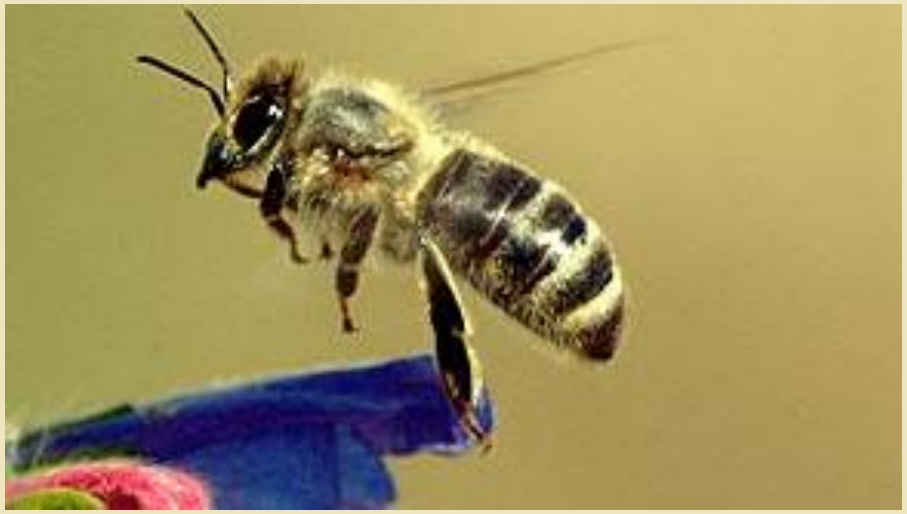
Identifying the bee types and understanding their lifecycle, duties and contribution within the hive.

Swarming and how to avoid it.

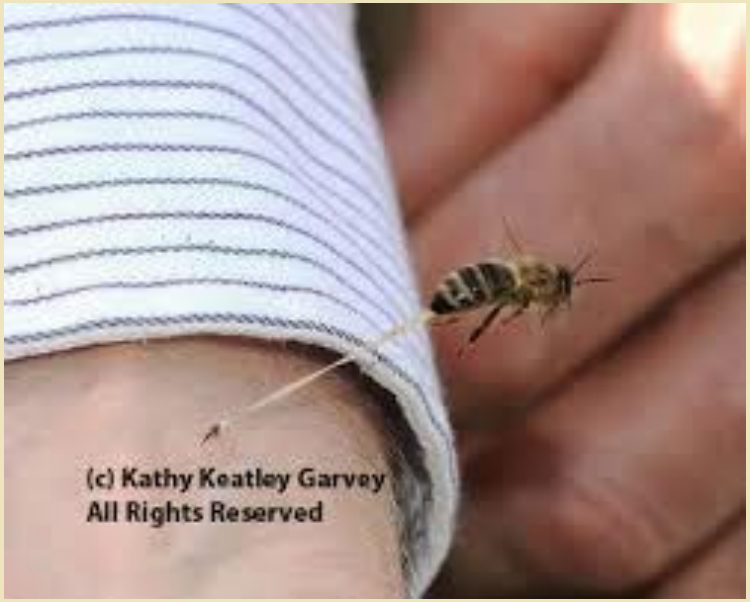
The challenges that bees face while trying to survive in today's environment.

What tools you will need to maintain your hives and manage your bees.

Friend or Foe ?



Bees do not want to sting
but
will fight to their death to protect the hive



Why Do We Need Honey Bees?

- Pollination - $17,000,000,000 in US crops per year
- 1/3 of our food supply as well as flowers and trees
  - Nuts – almonds, pecans …
  - Stone Fruits – peaches, apricots …
  - Vegetables – cucumbers, melons …
- 80% of US pollination is provided by Honey Bees

The Benefits of Having Honey Bees
Bee and Hive Products

- Honey – sweetener and allergy relief
- Pollen - protein
- Royal Jelly – health food in moderation
- Propolis - toothpaste
- Wax – soaps and candles
- Venom – Medical

Solitary Bees

- Every female is fertile
- Typically inhabits a nest she constructs herself.
- There is no division of labor so these nests lack queens and worker bees.
- Solitary bees typically produce neither honey nor beeswax.

Social Bees

- Live in organized groups called colonies.
- Have a Queen and a structured division of labor.
- Produce honey and beeswax
- Support multiple generations of offspring within the hive at the same time.

Life in the Hive

Honey Bee Types

Queen and Workers (Female)

Drones (male)

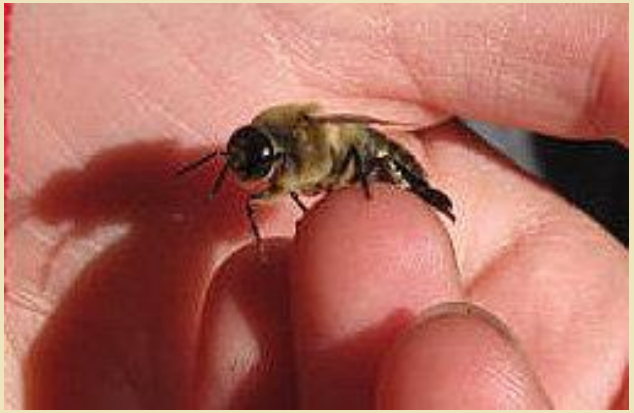
Queens

- About 14 days from egg to queen bee
- Can live up to 6 years (rarely more than 2)
- Eats only royal jelly
- Lays an egg a minute (1440/day) in prime season
- Flies from hive only once for mating
- Mates with up to 50 drones (Usually 20-25)
- 10 unique pheromones
- Can sting to kill other Queens
- One queen per hive

Drones

- **Primary job is to do nothing (it's a guy thing)**
- **Secondary job is mating with queens**
  - **Huge eyes to find the queen**
  - **Large wings to fly and hold queen**
  - **Dies during mating**
  - **Cannot sting**
- **Live 90 days**
- **24 days from egg to drone**
- **Kicked out of the hive in the fall**

Workers



- **All Female**
- **In summer**
  - **Live about 6 weeks**
- **In winter**
  - **Live up to 4 months**
- **Fly 500 miles in lifetime**
  - **All within a 1 mile radius of the hive**
- **About 21 days from egg to worker bee**

Lifecycle of a Worker Bee

- **They spend the first week as nurse bees caring for and cleaning up after the queen, feeding the larvae and making honey.**

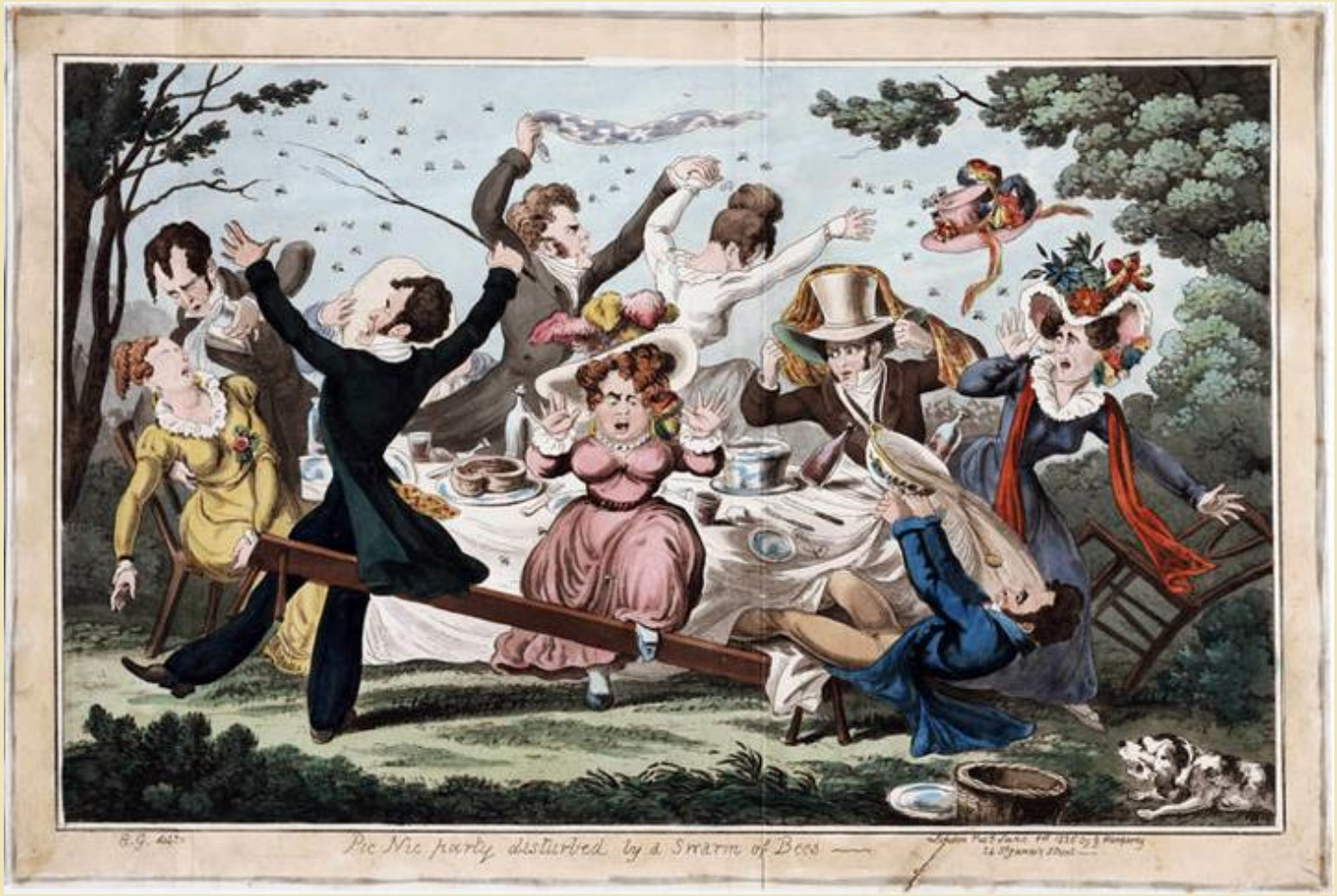
- **For the next week or two the worker bees care for the hive by making wax and building honeycomb, ventilating the hive with their wings and repairing any damage done to the interior of the hive.**

- **They will spend the rest of their lives, only about three weeks, gathering pollen and nectar for the colony.**

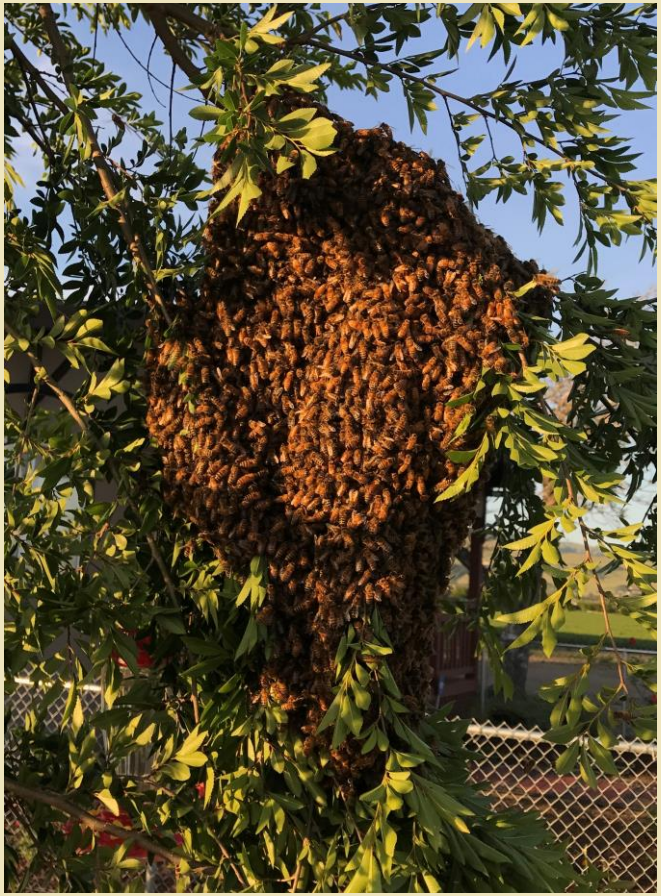
Pheromones

- **Bee's method of communication**
  - Total 42
    - Queen has 10 unique pheromones
    - Workers and queen share 32 pheromones
- **Alarm pheromone**
  - Similar smell to bananas
  - Produced by sting gland but can be masked with smoker
- **Come here pheromone**
  - Similar to lemongrass
  - Produced by Nasonov gland

Swarms!!



Swarms!!



- Generally Docile.
- Usually due to hive overcrowding.
- Usually only temporary visitors.
- Waiting for scouts to find a new long term home.
- Once removed stray scouts will remain for a few days
- Call a Beekeeper, not the exterminator

What can a Beekeeper do to reduce the chances of a swarm?

- Split the hive into two or more.
- Check the brood pattern for queen strength
- Monitor food supplies and watch for robbing
- Add new hive boxes when 8 out of 10 frames are filled with bees
- Harvest honey regularly so the queen has space to lay eggs in.
- Look for swarm cells along the base of a frame. (queen cups)

The Challenges Bees Face

Over 40% of bees are not surviving year to year

- Poor quality Queens
- Predation (Varroa, Wax Moth, Hive Beetle)
- Starvation (Land use conversion)
- Poisoning (Neonics, Fungicides)
- Robbing
- Poor Beekeeping Practices

Starvation

Lack of forage

- Agricultural land conversion
  - 319M acres of tillable land
  - 1 million acres converted each year
- Monoculture …
  - Corn and Soybean(180.3M acres)…
  - Almonds (1.5M acres)

Poisoning

- Systemic neuro-active insecticides (neonics)
- Automated planting machinery
- GMO coated seeds and crops
  - Enable spraying of ‘weedy’ food sources
- Tank Mix
  - Harmless chemical mixed to create deadly sprays
    - Careless cleaning practices

HOW NEONICS HARM HONEYBEES

Repeated exposure to neonics starts to change a bee's life and impact the entire colony. The science shows there are a number of different outcomes after exposure:

ILLNESS AND DEATH

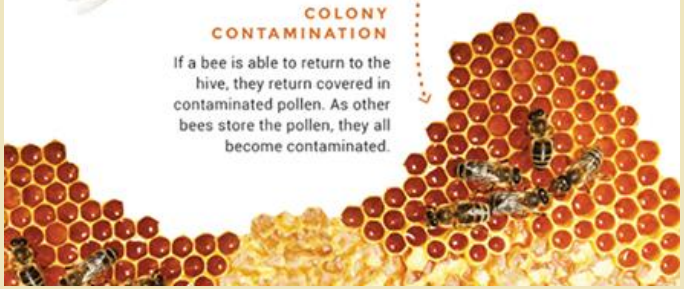
Neonics make it hard for bees to groom themselves, making them susceptible to disease and mites and weakening their immune systems.

LOST & CONFUSED

Neonics affect bees' ability to navigate back to the hive. Unable to find their way home, they die. Worker bees supply the colony's food. If they don't come back, the entire colony can starve.

COLONY CONTAMINATION

If a bee is able to return to the hive, they return covered in contaminated pollen. As other bees store the pollen, they all become contaminated.



Colony Collapse Disorder

- “Discovered” Fall 2007
- 30-50% losses over winter
- Symptoms:

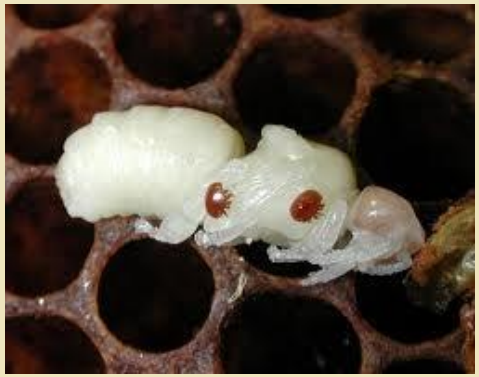
- **Collapsing Colonies**
  - Few bees, mostly young adults
  - Queen present
  - Food stores
  - Reluctance to eat beekeeper provided food
- **Collapsed Colonies**
  - No bees, dead or alive
  - Capped brood
  - Food stores
  - Not robbed by:
    - Other bees
    - Wax moth

Probable CCD Causes

- Pesticides and Fungicides
  - Symptoms:
    - Bees act intoxicated (neurological?)
    - Large amounts of dead bees outside of hive
  - Protect your bees
    - Commercial farming is nearby (2 mile radius)
      - Request spraying at night when bees are not flying
      - Request prior notification before spraying date.
    - Residential
      - Encourage neighbors not to use pesticides

The ‘BIG’ Challenge

- Varroa ‘Destructor’ Mite



What can you do to help?

- Add bee friendly flower and plants
  - Visit Bee Gardens:
    - UC Santa Cruz Arboretum
    - Gilroy Gardens
    - Local Nurseries, look for pollinators seeking out their favorite plants !!
- Provide water sources
- Support ALL types of local bees
  - 80 - 90 species of bees in the Bay Area
    - 80 - 85 are “solitary” native bees
    - 5 are the European Honey Bee
- Eat Haagen-Dazs Ice Cream

Proper Equipment Prevents Pain

Tools Of The Trade

- Smoker
- Veil or Full Suit
- Hive Tool
- Gloves
- *Frame Extractor*

Hive Types

Top Bar	Langstroth

Learn to be a Beekeeper

Local Bee Groups

- First Monday of the month
  Santa Clara Valley Beekeepers Guild
  6:15 pm
  Dwell Christian Church San Jose
  1292 Minnesota Ave San Jose CA 95125
  http://beeguild.org/

- First Tuesday of the month
  Gilroy Beekeepers Association
  7:00 pm
  Old City Hall Restaurant
  7400 Monterey Rd. Gilroy, Ca
  http://www.gilroybees.com

- First Saturday of the month
  Monterey Bay Beekeepers
  8:00 am
  Black Bear Diner
  2450 N. Fremont Street
  Monterey, CA 93940
  http://www.montereybaybeekeepers.org/

- First Wednesday of the month
  Santa Cruz Beekeepers Guild
  6:30 pm
  El Rio Mobile Home Park,
  2120 N. Pacific Ave. Santa Cruz, CA
  http://santacruzbees.com

Other Resources

- UC Davis bee resources
  - **Harry H. Laidlaw Jr. Honey Bee Research Facility http://beebiology.ucdavis.edu/**
  - **El Nino Bee Lab @ UC Davis http://elninobeelab.ucdavis.edu/**
- Videos
  - **King Corn - the science and politics of corn**
  - **More Than Honey – The challenges for bees and beekeepers**
  - **Vanishing of the Bees - CCD**
  - **Wings of Life – Pollination from the flower's point of view**

Thank You