

Beekeeping



Intro and overview



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Honey bees are very social

This is the reason we can keep honey bees, but not other bees.



**Other native bees & pollinators are not really social
except for some species of bumble bees.**



Social Animals

Because bees are social animals (yes, they are animals as are all insects), humans were able to learn to manage them, farm them, keep them



Bee keeping

This was done mainly for honey & some wax by everyone prior to the 1970s (?)



Since the 1970s(?) keeping bees for pollination has become very important.



Commercial Pollination

Commercial pollination services became available with the advent of monoculture cropping and the need for massive amounts of pollination on large acreage.



Native pollinator habitat declined at the same time as we began to farm taking out fence rows.



Native pollinators are efficient – built for the job

Blue orchard bees – need about 200 individuals per acre because they are really good orchard flower pollinators compared to honey bees.

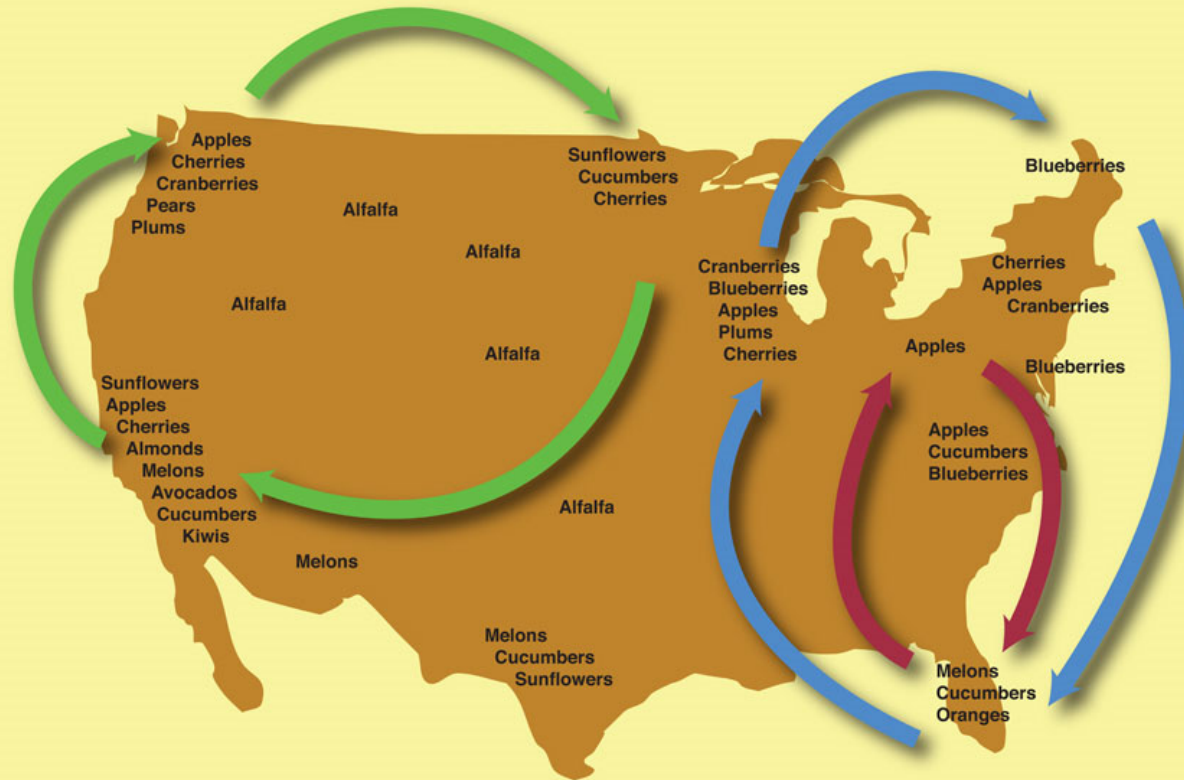


Commercial beekeeping operations may have tens of thousands of hives. Here, hives wait in for transport to the almond orchards for pollination. Photograph: USDA-

Almond pollination

Typically California almond orchards need 2 hives per acre, each hive has 20,000-30,000 individuals.

COMMERCIAL POLLINATION ROUTES



Because bees normally forage no more than one to three miles from their hive, commercial beekeepers move bees from one place to another in order to pollinate different crops during their bloom time. This map shows three different possible routes of a commercial beekeeper.

Corn is wind pollinated, does not need bees

Does that mean we can just ignore them in the mid-west? What about soybeans? Garden vegetables, alfalfa, hay fields



The value of native pollinators

A Canadian study estimates that canola growers would get better yields by turning 30% of their mono-culture cropland back into pollinator habitat



But....I stray from honey bee basics...we will talk more about native pollinators (honey bees are not) later



Honey bee Hives:

Our goal is to get familiar with hive terminology...but first....let's look at the background that got us into these hives.



What the bee wants

Storing honey & pollen are activities done by the colony in order to have enough food to survive the winter



What the humans want

Beekeepers take the honey and often substitute sugar water syrup supplement.



What we substitute

Many also feed pollen-substitute patties (a protein source) starting in late fall



What is a colony?

- A queen
- Workers
- Drones
- Brood combs
- Honey combs
- Pollen combs



The queen

In natural colonies, a queen is just a regular worker larvae that is fed extra royal jelly. She develops into a queen. Most beekeepers buy queens with “superior genetics” every year – like this marked queen shown here.

The queen’s job is to lay eggs.



Worker bees

Shown here packing in pollen for the winter. They have many, many roles and they rotate thru them as they mature. We'll discuss them more in another class.



Drones jobs:

They just hang out, they don't work

Fly & mate with the queen

Expendable as winter approaches



Brood

Brood are the eggs > larva > capped brood > pupae > emerge > worker



Brood comb

Is different than honey comb. It occupies a central “ball” within the hive



Pollen comb

Pollen collected from different flowers yields different colors



Honey comb



How does bee society work?

- More on bee biology in a later class.
- For now, we focus on the hive itself



History of beekeeping

is fascinating

– can't cover it here

– except for how we got to this place with our current hive set ups



OK – super brief history

Wild colonies – hunter-gatherer humans



Wild colonies – hunter-gatherer humans



History continued

Humans create artificial colonies and began keeping bees



History continued

Medieval Monasteries

First removable combs

Mead “beer” from fermented honey – commerce

Wax, candles, light, literacy



Straw skep hives were the norm



In a natural colony, the brood comb is in the center

The honey combs and pollen combs flank the brood comb



Bee space:

is between 5 and 8 mm or $\frac{1}{4}$ to $\frac{3}{8}$ inches space

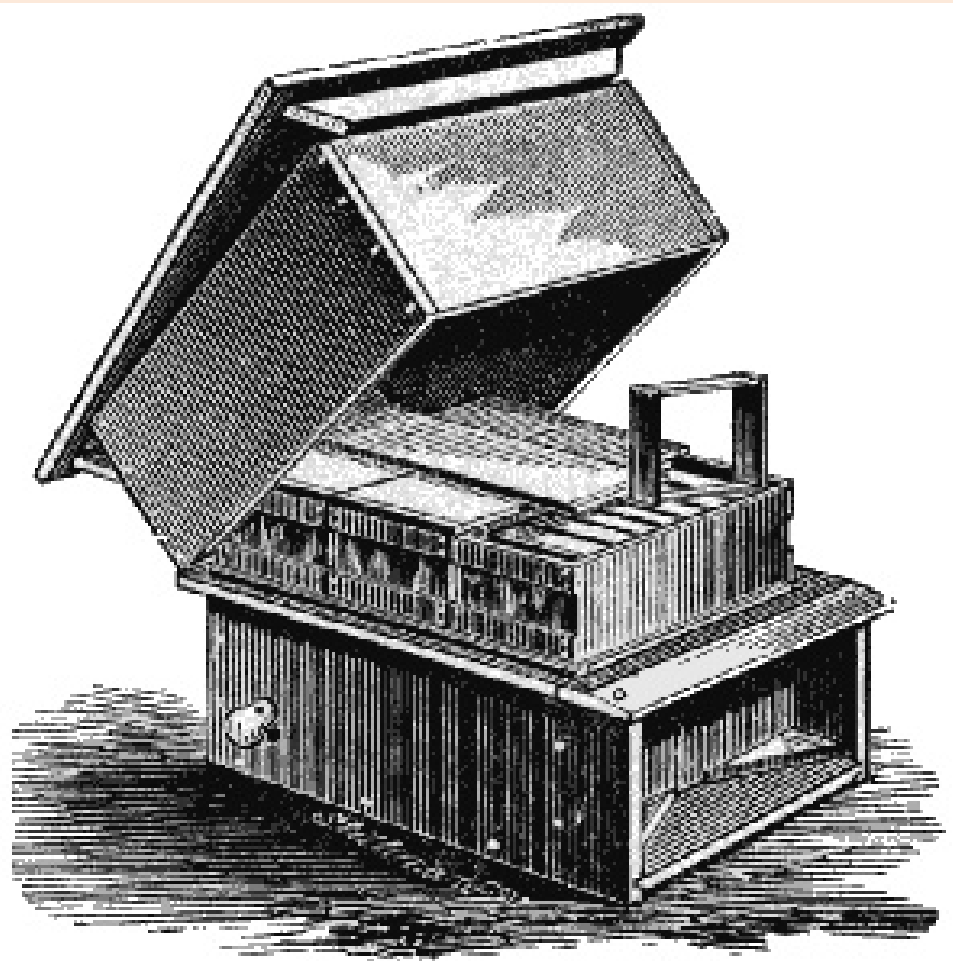


Lorenzo Langstroth (and others)

Observed and imitated the natural spacing in hives

Keeps the bees from being crushed, free passage ways form movement

Not blocked with wax or glued with propolis



The original Langstroth hive.

Langstroth patented his hive in 1852

Langstroth designed a box with frames that would have correct bee spacing



Bees in a Langstroth hive fill round comb in a square frame



Bees now will build parallel combs

And because of standardized boxes, a commercial industry is born



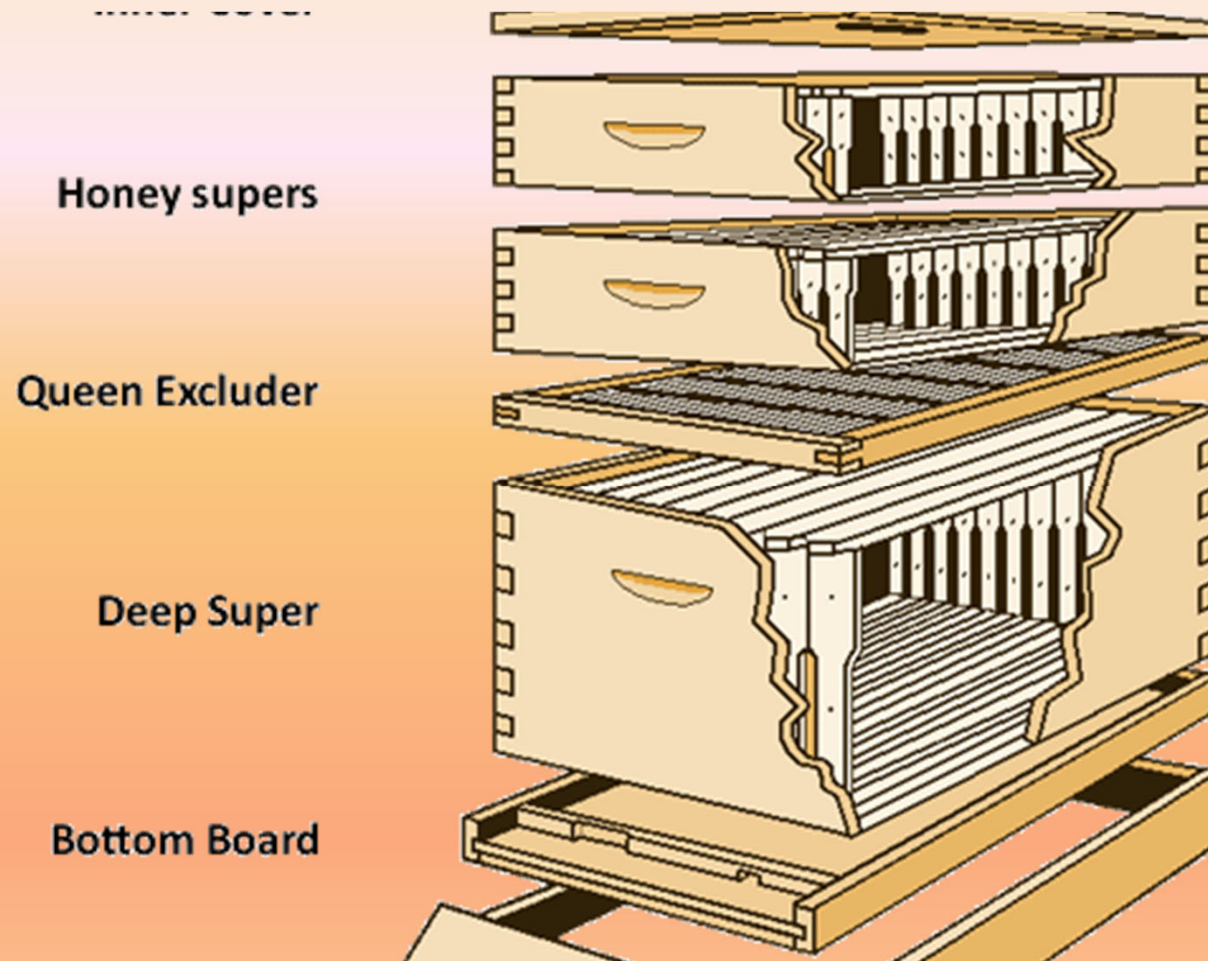
Langstroth hives:

Frames can be removed, inspected, honey harvested



Langstroth hive benefits:

No bee squishing!
Fewer alarm pheromones!
Fewer stings
Happier beekeepers



Standardized hives

Langstroth & Dadant standardized the hive
Other standardized equipment followed
Commercial beekeeping became possible



Natural” beekeeping movement

“– top-bar hives,
leave bees keep the honey
Pollination is the goal
Maybe just enjoyment



The physical organization of a hive

Two deep brood boxes

Several honey “supers” (superimposed boxes)



How much honey?

A really strong colony makes 200 lbs per year

In northern climates bees should keep at least half that

You can harvest the rest



Standardized hives

Moveable hives = transportation, en-masse
Bees become commodities
As in other cases where humans forget natural & sustainable principles





Problems often result:

New diseases – varroa mites

Loss of bumblebees – the big yellow banded ones of childhood

Colony collapse disorder – causes still under debate



You are part of a solution

Beekeeping with new people: learning, practicing, observing, preserving, discovering, improving.



There is an annual cycle to hive life

The beekeepers job is to facilitate the managed growth of the hive, usually by helping manage colony size during nectar flows without losing part of the hive to swarming. We will examine the seasons of a hive as we work through the course.



What will the bee story be next?

Welcome to the journey