



Beekeeping Basics & Beyond



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From Mahwah, New Jersey – I have been beekeeping for 10+ years!

Thank You for joining me today!

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MY MISSION FOR THIS PRESENTATION:



To teach the fundamentals of beekeeping and provide insight into the complexities of raising a honeybee colony. To clearly demonstrate best practices for working in partnership with the bees.



Overview of what you will learn today:

- 1.** Why beekeeping?
- 2.** Equipment, tools, and resources.
- 3.** The beekeeper and honeybee relationship
- 4.** Activities of the hive
- 5.** Varroa Mite Management, pests, diseases
- 6.** Common mistakes of beginning beekeepers
- 7.** Understand the seasonality of bees





Helping people build resilient communities through local and sustainable solutions that reduce poverty, strengthen self-reliance, and protect natural resources.

NCAT MISSION



Trusted

Since 1976 NCAT has provided relevant information, individualized technical assistance, and in-depth resources to support sustainable agriculture and accessible energy solutions.

Practical

NCAT's trusted knowledge base provides scalable solutions to strengthen self-reliance, reduce poverty, and protect natural resources.

Connector

NCAT facilitates meaningful connections among sustainable agriculture producers, renewable energy experts, innovative thought leaders, researchers, and industry professionals. NCAT'S role as a connector results in valuable networks and lasting change.



Common Mistakes:

- 1.** Find a mentor
- 2.** Self-Education
- 3.** Planning & Budgeting
- 4.** Fear
- 5.** Smoke your hives!
- 6.** Management System
- 7.** Inspecting to much
- 8.** Placement & forage
- 9.** Too many hives
- 10.** Details, infrastructure
- 11.** Build a good fence
- 12.** Don't chase swarms
- 13.** Inspiring robbing
- 14.** Local Forage
- 15.** Pulling honey to soon
- 16.** Don't quit – ask for help
- 17.** Treatment schedule





Mahwah Environmental Volunteers Organization

@mevoearth / mevo.org









2022





MEVO
Fresh Roots Farm
Mahwah, New Jersey • mevo.org







Why beekeeping?



Why beekeeping?

- 1.** Honey
- 2.** Pollination
- 3.** Environment
- 4.** Social
- 5.** Spiritual
- 6.** Profits

A Beekeeper is honored with the opportunity to practice stewardship of the vitality of the bees.



Apis Mellifera – Western Honey Bee



Genus: *Apis* Species: *Mellifera* Family: *Apidae*



Genus: *Apis* Species: *Mellifera* Family: *Apidae*

Apis Mellifera – Western Honey Bee

Apis is the Latin word for, “bee,”

In Latin *Mellifera* means, “Honey Bearer.”

Meli is the Greek word for, “Honey,”

Ferre Latin word for, “to bear/carry.”

The honeybee is the bearer or maker of honey.

All bees in the genus *Apis* produce honey!

All worker bees within the family *Apidae* carry pollen on their legs in pollen baskets (*Corbiculae*).



Apis Cerana – Eastern Honey Bee



Apis Cerana – Eastern Honey Bee



Apis Cerana – Japanese Natural Beekeeping



Apis Dorsata – Giant Honeybee & Apis Laboriosa (Himalayan Giant Honeybee)



Apis Dorsata – Giant Honeybee & Apis Laboriosa (Himalayan Giant Honeybee)



Honey Hunters in Nepal – Harvesting, “Mad,” honey



Apis Florea – Dwarf Honey Bee (Smallest honeybee)



Apis Florea – Dwarf Honeybee (Smallest honeybee)



Bumble Bee – Genus: *Bombus* Family: Apidae



Yellowjacket - Genus: *Vespula* Family: Vespids



Predatory Wasp
Eat Nectar, Pollen, and Meat
Pest control & pollination



Solitary Bees & native bees 3,600+ species in the USA

Agapostemon Sweat Bee



Mining Bee – Andrena Violaee
(only pollinates violet flowers!!!)



Find a mentor 

PROGRAMS

ENTERPRISE

KEYNOTES



MASTER BEEKEEPING

Cornell Certificate Program

TELL ME MORE!

Ohio State
Beekeepers Association
ohiostatebeekeepers.org

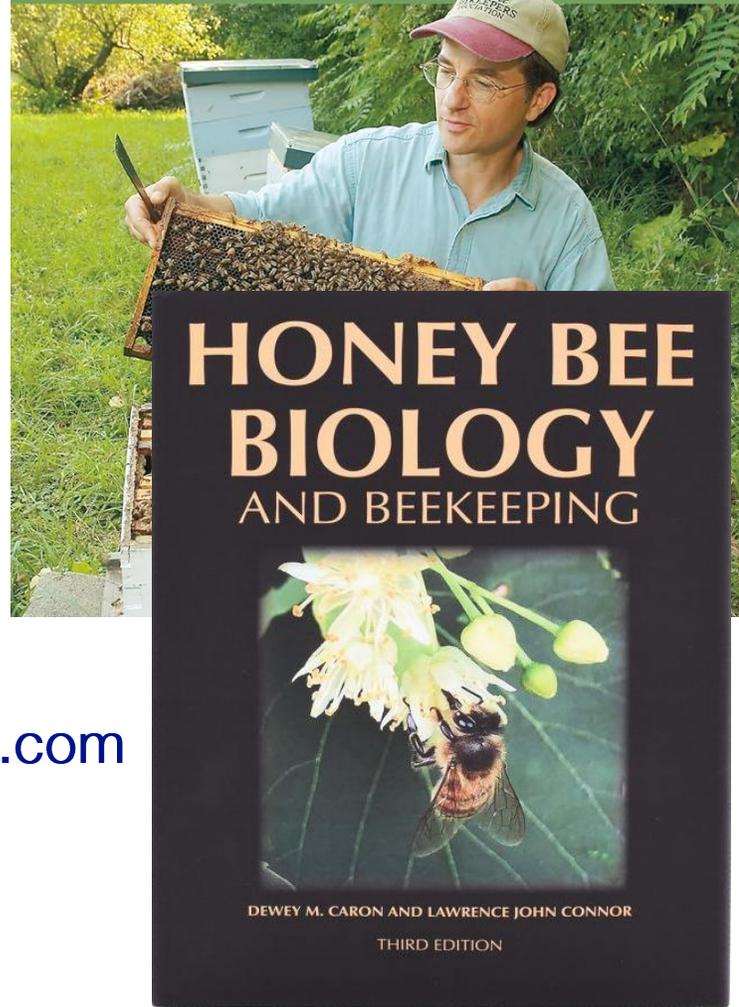
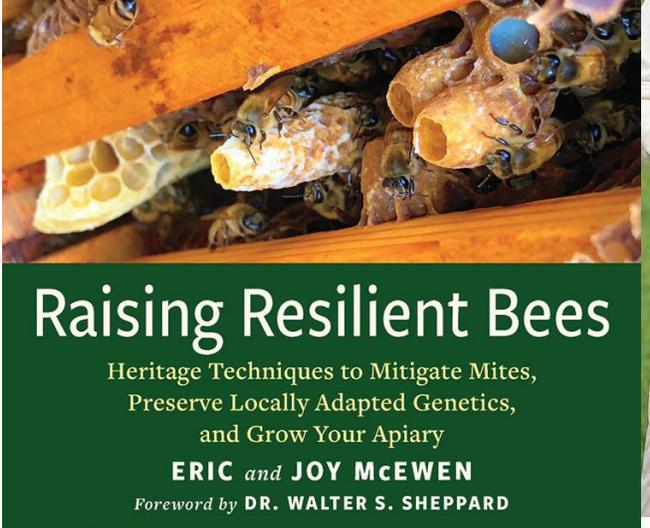
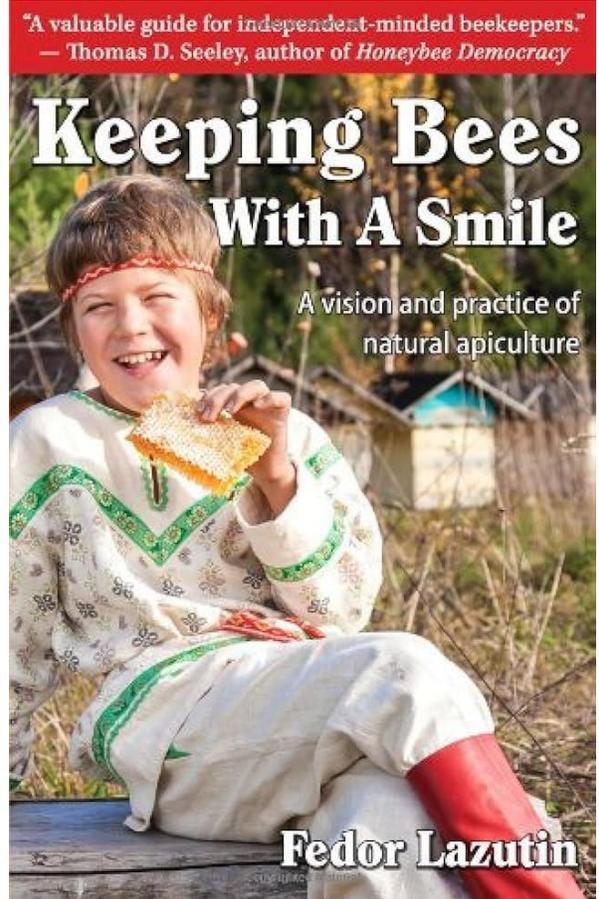
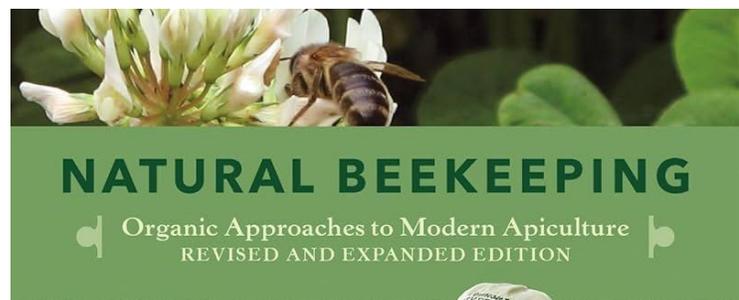
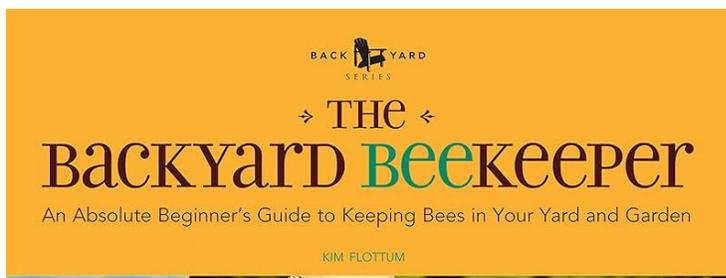
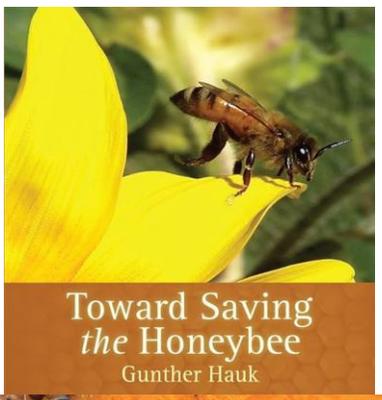
 XERCES
SOCIETY
for Invertebrate Conservation
xerces.org

 the bee
conservancy
thebeeconservancy.org

 EAS
EASTERN
APICULTURAL
SOCIETY
easternapiculture.org

Books

Self-educate 



scientificbeekeeping.com
horizontalhive.com
spikenardfarm.org

Honey Production



What is in Honey?

Acids

Honey has a sweet taste but it is actually acidic. Much of the acidity is contributed by gluconic acid but other acids are naturally present in honey as well, such as formic acid, oxalic acid, acetic acid, and lactic acid.

Vitamins and Minerals

Honey contains trace amounts of vitamins and minerals. Darker honeys and honeydew honeys are the highest in vitamins and minerals. These include vitamins B1, B2, B3, B6, and C along with minerals sodium, potassium, magnesium, calcium, copper, iron, manganese, phosphorus, chlorine, and sulfur. The levels are extremely low... only about 0.17% of honey - and make up a tiny fraction of a person's recommended daily intake.

Microorganisms

Most bacteria do not grow in super-saturated sugar solutions such as honey.

Sugar-tolerant yeast spores are often present in the honey, but the low moisture content prevents their activation. Should the moisture level increase, yeast spores can activate and the yeast can multiply, putting honey at risk of fermentation.

Clostridium Botulinum is most notable. While the active bacteria cannot survive in honey - its spores can. Over 2,000 honey samples found that 5% contained *Clostridium Botulinum* spores. If spores are consumed, they can become active and cause an infection of botulism. The bacteria produce a neurotoxin that can cause paralysis and death. Infants under the age of 12 months are at risk because they have not yet developed the healthy gut microbiome that outcompetes the bacteria. (Adults, on the other hand, are not affected by the spores.) For this reason, honey should never be given to infants under a year old.

What is in Honey?

The *Clostridium botulinum* spores naturally present in some honey are risk to infants

Sugars comprise 98% of the solids found in honey, making it a great sweetener.

Major sugars present in honey are: fructose and glucose

Minor sugars are: sucrose and maltose

The chart below shows the typical composition of honey:

Microbial composition of honey is influenced by Nectar collected and environmental conditions.

Worker honeybees produce an enzyme called glucose oxidase in a secretory organ in their heads called the hypopharyngeal gland. Glucose oxidase converts glucose into hydrogen peroxide (H₂O₂) and water. Creates a low PH, high sugar, and low moisture.

Check out the field of Apitherapy

Component	Average	Range
Moisture	17.2%	13.4–22.9%
Fructose	38.19%	30.9–44.3%
Glucose	30.3%	22.9–40.7%
Sucrose	1.3%	0.2–7.6%
Maltose	7.3%	2.74–15.98%
pH	3.91	3.42–6.10

This chart is based on White, J.W., M.L. Riethof, et al. 1962. Composition of Americans honeys. U.S. Department of Agriculture, Technical Bulletin 1261:124

How much honey do we eat in the USA?

U.S. consumption of honey and made-with-honey products reached an all-time high of **688.6 million pounds** in 2024

Source: <https://honey.com/newsroom/press-release/u-s-honey-consumption-hits-all-time-high-according-to-usda>



Honey Production – 5-gallon (60lb) bucket per hive per year

Most local retail honey sellers:

16oz (1.5lb of honey)
for \$12.00

.75 ¢ per 1 ounce

Supply & demand

I sell honey for

8oz jar (3/4lb of honey)

\$1.875 per ounce

Or 16oz for \$30.00



How much honey per hive? It depends...

Weather
Forage
Age



NUCS ~(\$210 each) or Packages ~(\$180 each)



Queen Rearing (\$25.00 - \$65.00 per queen)

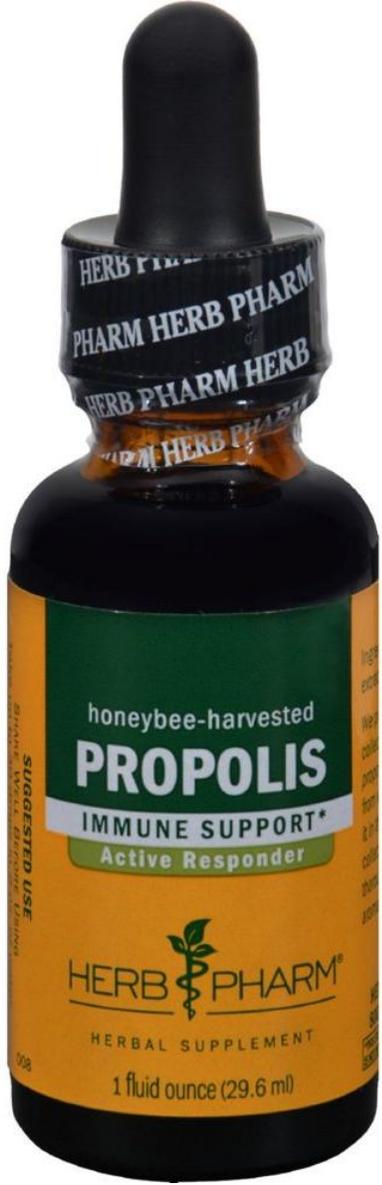
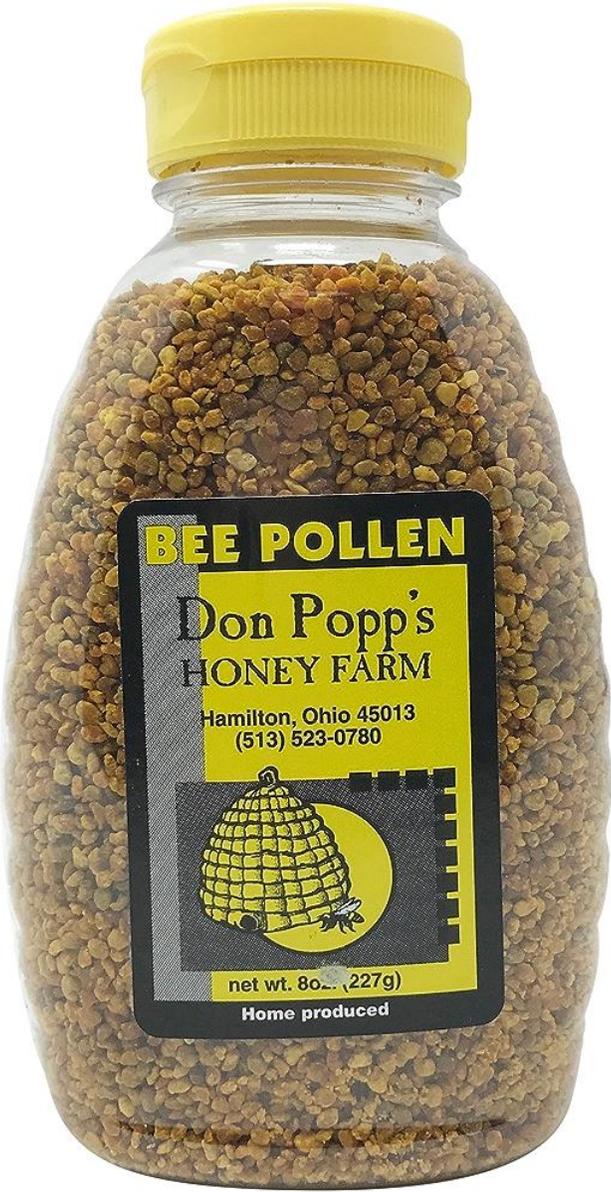


Pollination



Medicinal & Herbal

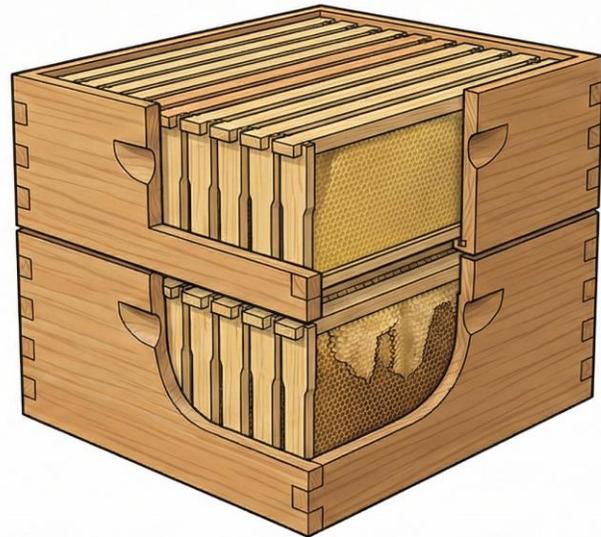
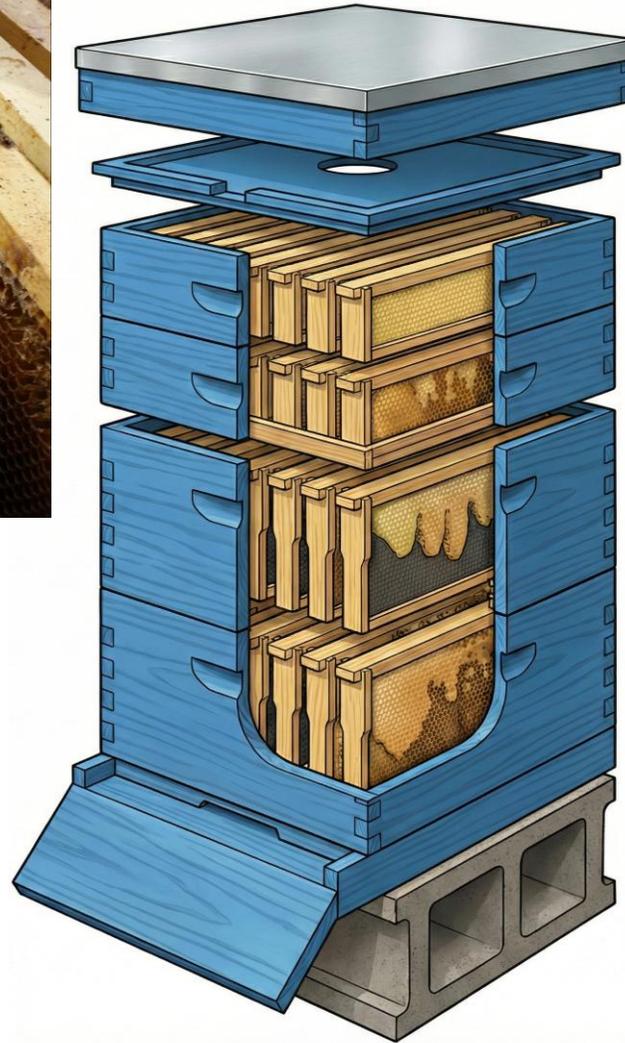
Propolis Tinctures
Wax
Pollen
Royal Jelly
Candles as well...



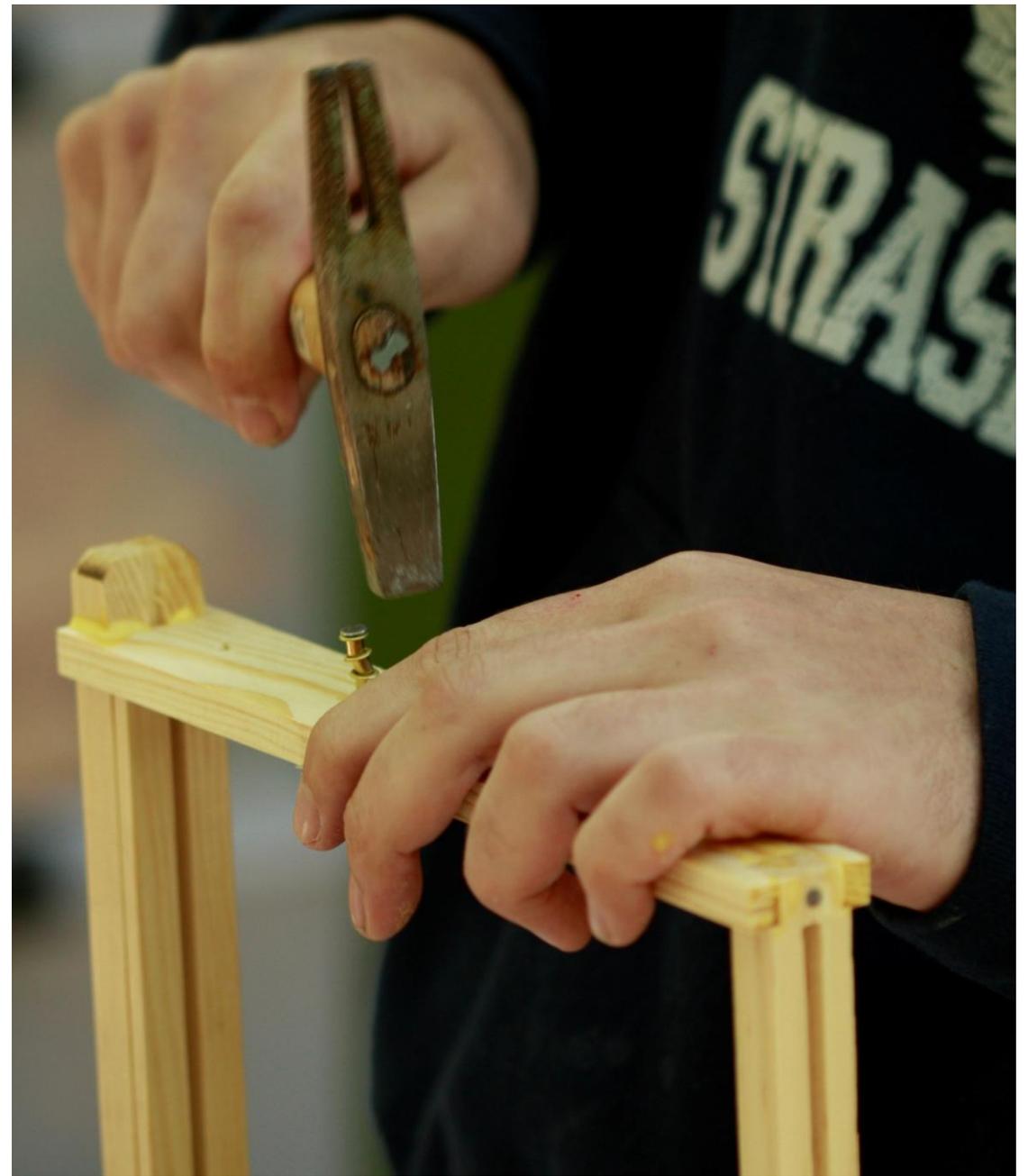


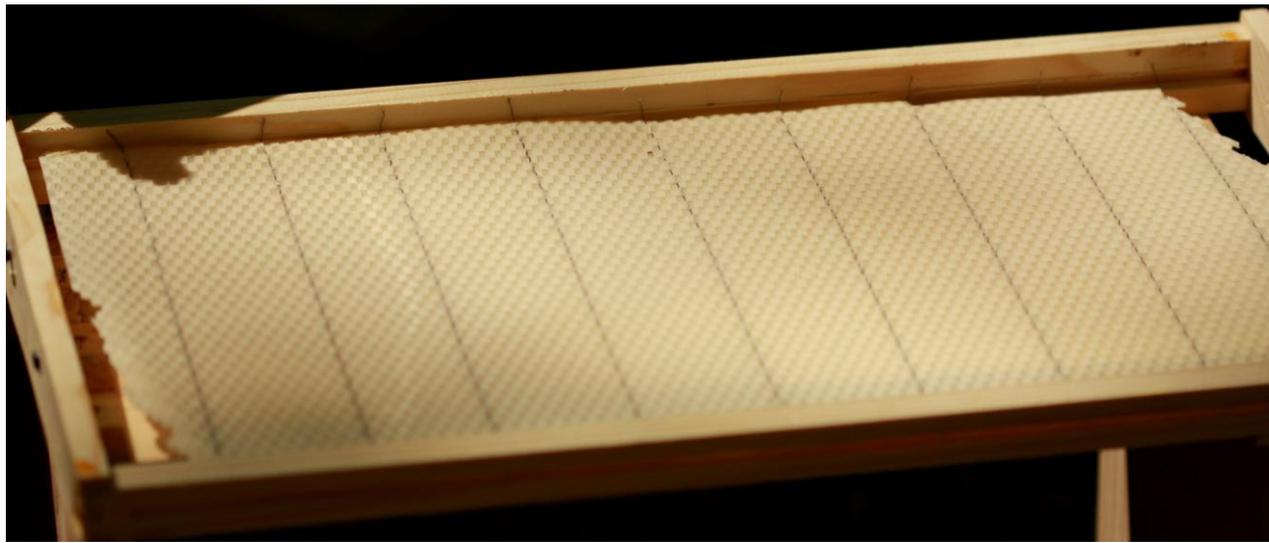
Getting started

What is in a hive? (Wooden Equipment)









**Minister
Lorenzo Langstroth
1851**

“Bee Space” $5/16^{\text{th}}$ in

**Bees will build excess
comb in space larger
than $3/8$ ”**

**Bees fill any space less
than $1/4$ ”**



What is in a hive? (Biological life)

1. Bees 30,000 – 50,000 individuals depending a the time of year.
 2. Beeswax comb
 3. Wooden frames & some plastic.
 4. Honey (nectar ripened down to 17 – 18% water)
 5. Water (stored as small droplets and used for cooling)
 6. Propolis (gummy tree sap & flower glue)
 7. Pollen or Bee Bread (7 day fermented with saliva & yeast)
- All sorts of other microbial life and little creatures...
8. Wax Moth
 9. Hive Beetles
 10. Varroa Mites
 11. Sometimes spiders, mice, etc.
- A lot more...



Worker - Pupa 12 Days - 21 Days



Queen - Pupa 7 Days - 16 Days
Can lay up to 1000 eggs a day
5 to 8 day mating flight



Drone - Pupa 15 Days - 24 Days



Stages of Development **Bees go through**
Egg – 3 Days **Complete Metamorphosis**
Larva – 6 Days **4 Different Life Stages**

The HIVE is a Eusocial Super Organism: with over 50,000 related individuals living in a healthy full-sized hive working together & cooperating as one singular entity.

1. Perennial life cycle

Eusocial behavior

2. Cooperative brood care

3. Female caste

4. Generation overlap

Other examples of eusocial super organism

Ants & termites



The HIVE is a Eusocial Super Organism

Worker Jobs – just to name a few...

1. **Nurse caring for young “brood,”** being reared in frames – Hypopharyngeal Glands produce royal jelly.
2. **Building the nest** – producing wax with wax glands (12 days old)
3. **Fighting parasites** and pathogens
4. **Stocking, storing, and inventory** of hive resources: pollen, honey, nectar, etc.
5. **Cooling the hive** and warming the brood
6. **Undertaker** or cleaning the hive
7. **Queen** attendant
8. **Defense** of hive from predators
9. **Honey production**
10. **House Bee** cleaning and grooming
11. **Forager** for resources: pollen, propolis, water, nectar



Equipment to get started with two hives: Dadant - dadant.com

Mann Lake - mannlakeltd.com

Betterbee - betterbee.com

Langstroth Hive 10-Frame Parts:

1. Outer cover: 2
2. Inner Cover: 2
3. Super Shim: 2
4. Wooden Hive Top Feeder: 2
5. Deep Hive Bodies: 4
6. Deep Frames: 100
7. Deep Wax Foundation Sheets: 100
8. Medium Honey Supers: 8
9. Medium Frames: 100
10. Medium Wax Foundation Sheets: 100
11. Screened Bottom Board: 2
12. Solid Bottom Board: 2

Equipment for hive management:

1. Jacket / half suit & veil: 2
2. Full ventilated suit: 1
3. Goatskin Gloves: 2
4. J Hook End – Hive Tool: 2
5. Bee Brush: 1
6. Bee Smoker with Shield
7. Disposable Nitrile Gloves
8. Varroa Sticky Bottom Board: 6
9. Drone EZ Frame: 2
10. Mite Away Quick Strips (10 pack): 1
11. Apiguard Foil (10 pack): 1
12. Varrox Oxalic Acid Vaporizer: 1
13. Fire Extinguisher
14. Sugar, and more...

Beekeeping Basics

attra.ncat.org
ericf@ncat.org

Prices from Dadant.com

Beginning Equipment Budget
2 Langstroth Hives

Items not included:

1. Sugar
2. Bees
3. Electric Fence
4. Smoker Fuel
5. Land Access

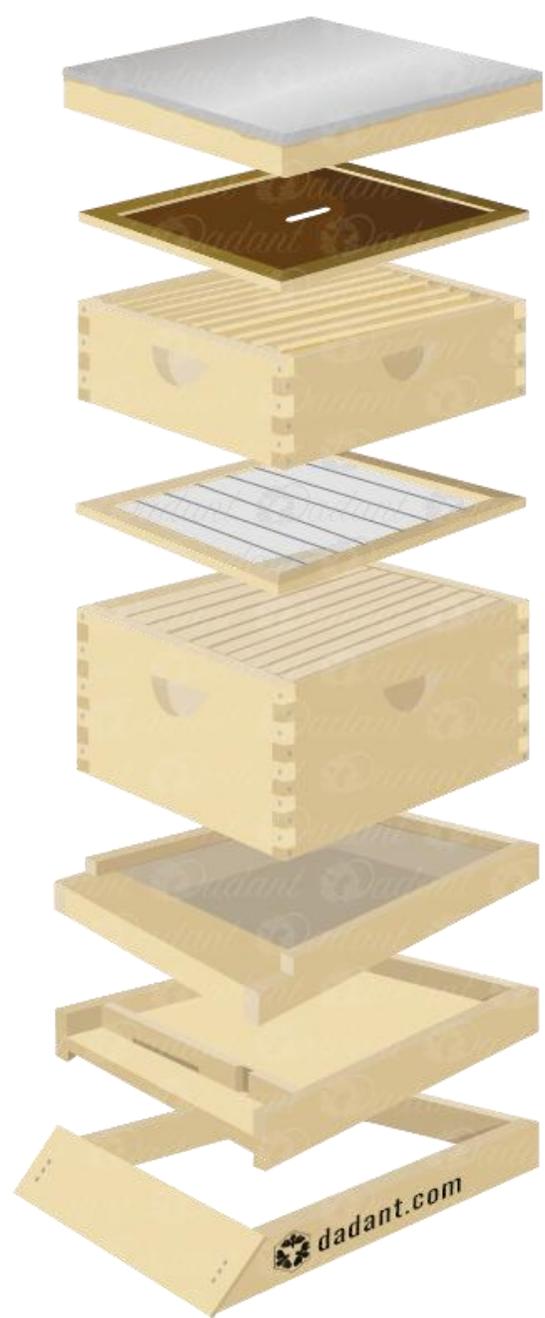
Gear	Quantity	Price Each	Total
Langstroth Hive 10-Frame Parts			
Telescoping Metal Outer Cover Commercial Assembled	2	38.95	77.9
Inner Cover with Feed Hole Plywood Assembled	2	20.95	41.9
Super Shim Select Assembled	2	7.25	14.5
Wooden Hive Top Feeder Select Assembled	2	36.95	73.9
Deep Super 9 5/8" Commercial Unassembled	4	22.85	91.4
Deep Frames 9 1/8" Wedge Top Grooved Bottom Bar Unassembled - 100 Pack	1	134.95	134.95
Deep 8 1/2" x 16 3/4" Crimp Wired Long Hook - 50 Pack	2	88.95	177.9
Medium Super 6 5/8" Commercial Unassembled	8	20.5	164
Medium Frames 6 1/4" Wedge Top Grooved Bottom Bar Unassembled - 100 Pack	1	134.95	134.95
Medium 5 5/8" X 16 7/8" Plain No Wire (Medium Brood) - 50 Pack	2	63.95	127.9
10-Frame Screened IPM Bottom Board Select Assembled	2	27.95	55.9
10-Frame Bottom Board Commercial Unassembled	2	17.95	35.9
Equipment for hive management			
Jack / Half Suit & Veil	2	94.95	189.9
Economy Ventilated Full Suit	1	159.95	159.95
Goatskin Gloves	2	31.95	63.9
J Hook Hive Tool	2	12.95	25.9
Bee Brush	1	8.95	8.95
Smoker 4 X 7 Stainless Steel with Shield	1	55.95	55.95
ForPro Disposable Nitrile Gloves 4-Mil 100 Count (Amazon)	1	11.99	11.99
Varroa Mite Sticky Board	6	5.35	32.1
Deep 9 1/8" Single Coated Green Drone Comb EZ Frame	2	4.95	9.9
Mite Away Quick Strips 10 Doses	1	62.95	62.95
Apiguard Foil Pack - 10 Pack	1	54.5	54.5
Varrox Oxalic Acid Vaporizer (Betterbee.com)	1	174.95	174.95
Amerex 2-A 2.5 Gal Water Fire Extinguisher (Home Depot)	1	174	174
TOTAL			\$ 2,156.04

Beekeeping Basics**attra.ncat.org****ericf@ncat.org****Prices from Dadant.com**

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Beekeeping Basics
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- # Hive Parts – lets look at our example!
- 7.** Outer cover
 - 6.** Inner Cover
 - 5.** Medium Super / Honey Super
 - 4.** Queen Excluder
 - 3.** Deep Super / Deep Hive Body / Brood Box
 - 2a.** Screened Bottom Board
 - 2.** Solid Bottom Board
 - 1.** Landing Board



Site Selection





**Build a good electric fence
plan for bears, people, have a plan for predators & pests.**







Learn your
local forage



NJ Plants from Which Bees Gather Pollen

Common Name	Approximate Blooming Time
Skunk Cabbage	February - March
Spice Bush	March - April
Maples	March - Mid April
Hazel	Late March - Early April
Elms	Late March - Early April
Willows	Late April
Dogwood	May
Dandelion	May
Ash	May 1 - 15
Horse Chestnut	May - June
Birch	May 15 -30
Hickory	May
Oaks	May
Locust	Late May - Early June
Crimson Clover	May

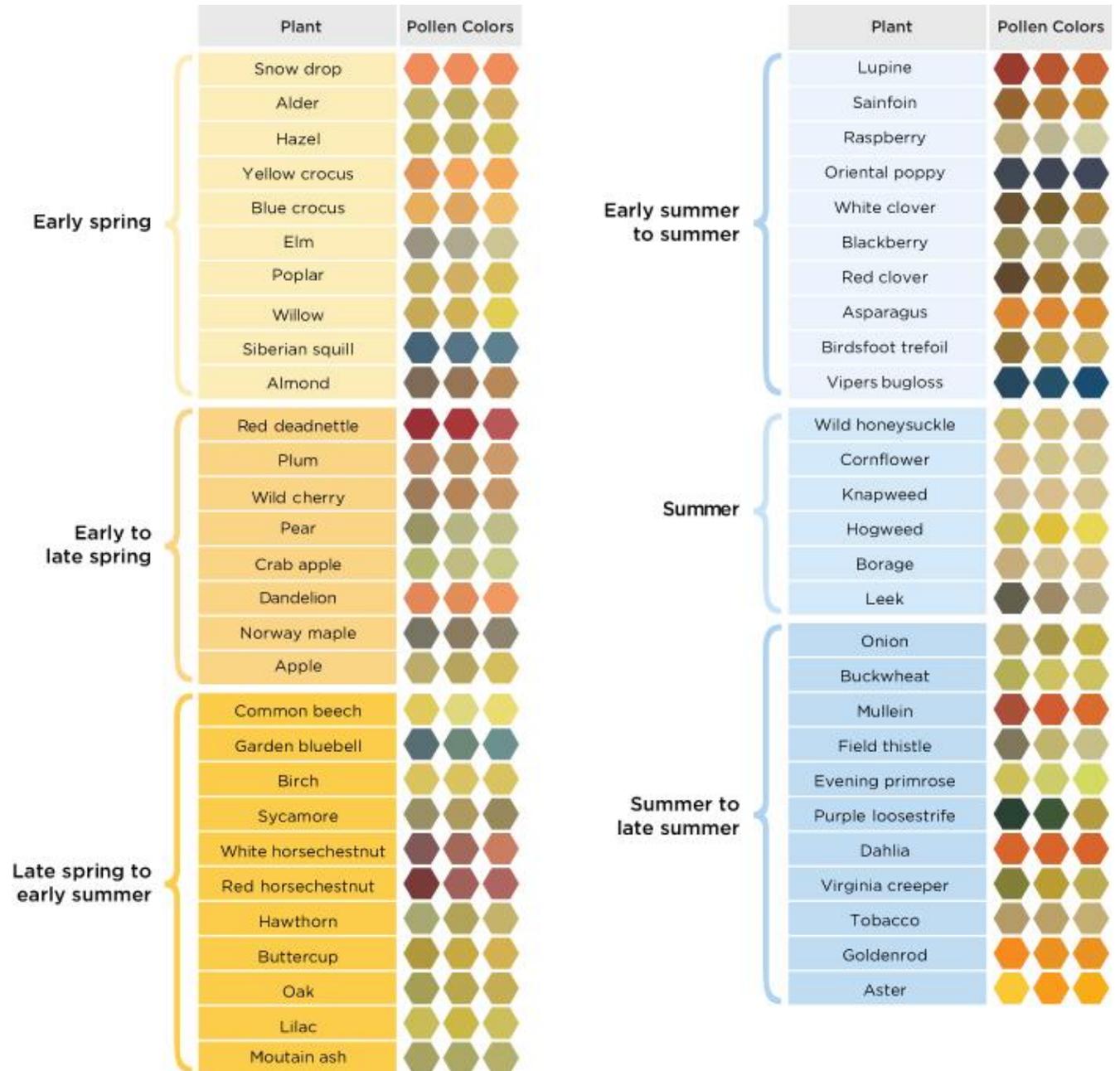
Source:

**New Jersey
Beekeepers
Association**

<https://njbeekeepers.org/PollenPlants.htm>



NJ Surplus Honey Plants	
Common Name	Approximate Blooming Time
Crimson Clover	Mid May
Locust	May 20 - June 1
Tulip Tree	May 20 - June 10
Swedish Clover	June 1 - July 10
Alsika Clover	June 1 - July 10
White Clover	Early June - Mid July
Dogbane	Early June - Late August
Indian Hemp	Early June - Late August
Basewood	Late June - Early July
Linden	Late June - Early July
Huckleberry	Late May - Late June
Blueberry	Late May - Late June
California privet	Mid July - Late July
Sumac	Mid June - Late July
White sweet clover	June - November
Yellow sweet clover	May 20- June 15
Cranberry	June 15- August 15
August Flower	Late July - Late August
Soap bush	Late July - Late August
Sweet pepper bush	Late July - Late August
Rose Mallow	Late July - Early September
Swamp Mallow	Late July - Early September
Spanish needle	Mid August into October
Heartweed	Late August - Mid October
Smartweed	Late August - Mid October
Blackheart	Late August - Mid October
Heath aster	Late August - Mid October
White aster	Late August - Mid October
St. MIChaelemas daisy	Late August - Mid October
Goldenrod	Late August - Mid October
Buckwheat	Early August - Late August



Site Placement & Forage







Too many hives too soon: Quality over quantity
How do I be a perfect beekeeper?
Master the little things.



Part 3: Best Practices & Management Ideas





4. Fear



5. Smoke your hives!!!







**Plan early,
be detailed
orientated, &
build hive
infrastructure**











What do bees eat?

1. Honey
2. Pollen / Bee Bread
3. Nectar
4. Water (from Nectar)

What do we feed bees?

5. Pure refined cane sugar
 6. Bee Stimulant or herbal tea
- Summer Ratio 1: 1 / Winter 2:1



- 5lb of sugar – 1 gallon of water (thin)**
- 10lb of sugar – 1 gallon of water (winter)**













Let's go inside!









What is your management system?



- 1.** What days am I beekeeping each week and why?
- 2.** What equipment am I bringing?
- 3.** Do I have all the gear for the days work that I need?
- 4.** What is the weather today and this week? Back up day?
- 5.** What forage is available this time of year?
- 6.** Did I review my notes from last inspection?
- 7.** How will I effectively manage my hives today? How may they be doing today?



Management Systems

Gear to always bring to the hives:

1. Notebook & camera
2. Sugar & feeder
3. Bucket pre-marked, drill, auger
4. Smoker + Smoker Bucket
5. Smoker Fuel + Lighter
6. Two hive tools
7. Full Suit
8. Half Suit
9. Nitrile gloves + alcohol / wipes
10. Band-Aids – healing salve
11. Fire extinguisher (near by)

Gear to usually bring to the hives:

1. Deep hive body with frames & foundation
2. Medium honey super with frames & foundation
3. Sticky board
4. Drone Frame
5. Alcohol Wash & Sugar Shake



Looking for the Queen:

If we find eggs the queen was there in the last
three days = our hive is queen right.



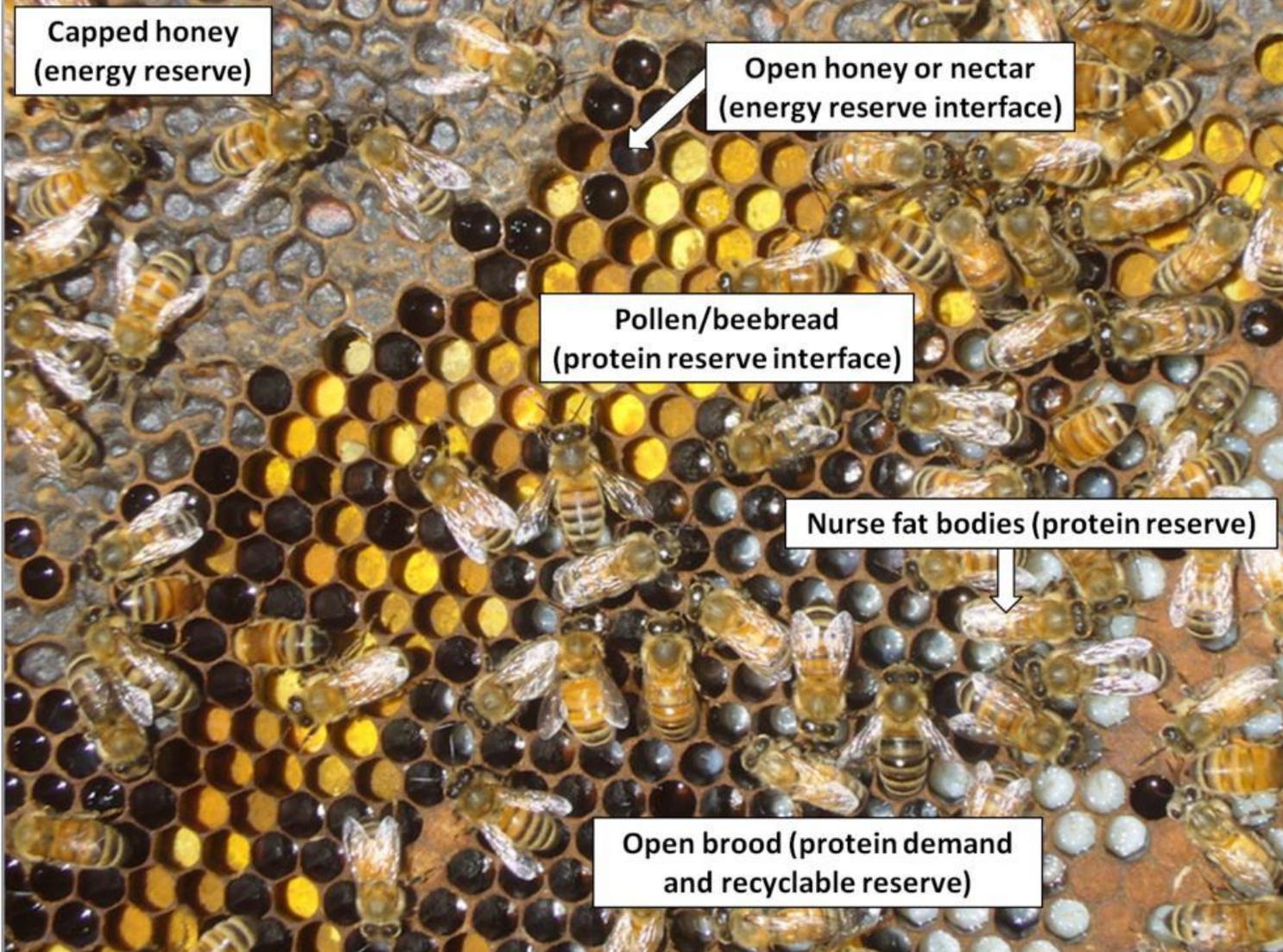
Royal Jelly can tell you a lot! – It is produced in the Hypopharyngeal & Mandibular Glands (bees head)

Look at the amount of **Royal Jelly** surrounding a young larvae. Abundant white pools of royal jelly signal that there is a lot of protein available for nurses to synthesize into royal jelly, while colonies with little or no jelly may benefit from a protein supplement or pollen patty.



This slide is from Randy Oliver

<https://scientificbeekeeping.com/first-year-care-for-your-nuc/>



Types of inspections:

1. Visit & Observation (all weather)
2. Feeding
3. Light inspection & add equipment top super only
4. Half inspection Queen right?
5. Disease or swarm concerns – full inspection
6. Hive inventory



Stages of my inspection:

1. Prepare smoker, equipment, and tools near the hives.
2. If feeding, make sugar water.
3. Get notebook and pen ready.
4. Review plans for each hive.
5. Set timer execute inspection.

5 Minutes: super-light inspection. Add honey super or deep.

15 Minutes: light inspection or half inspection. Find eggs...

30 – 45 Minutes: deep inspection, hive inventory & record keeping, alcohol wash / sugar shake, varroa treatment application.

6. Take notes on hive results.

Tips

1. Phone muted
2. Sickle for clearing weeds
3. Platform, crate, or location for stacking equipment free of debris
4. Extra fuel & green material nearby



What I do when and why...

1. This hive has a more defensive temperament – I will inspect them at a sunnier time of the day or later as to not disturb the apiary.
2. There is a dearth in the honey flow or available forage – I will bring a weathertight tote to hide frames. I will be quick.
3. I want to do a full hive inventory – I will smoke hive more than normal, deconstruct the hive down to the lowest deep, stacking deeps & supers nearby, inspect from bottom up.
4. It is a really hot day – I will pack extra green material in my smoker. I will be quick
5. If things go bad – I will stop early and close the hive up.



**Don't chase swarms –
plan way ahead with
swarm boxes**



<https://www.horizontalhive.com/honeybee-swarm-trap/bait-hive-how-to-catch.shtml>



Inspecting to much - Knowing when to stop



**Is continuing urgent to
the survival of my bees?**

Do I NEED to force this?



Hive reproduction – Queen Cells

1. Emergency Cells
2. Supersedure Cells
3. Swarm Cells

Why might a queen be replaced?

- Reduced or weakened pheromone
- Diminished egg laying
- Over abundance – swarming
- Crushed by accident by beekeeper
- Killed by Varroa Mite treatment

Drone Congregation Areas! (DCA's)



Uncapped Queen Cup Royal Jelly visible



Swarm Cells



















Trophallaxis between two female workers utilizing proboscises (tongues)



Pulling Honey off of a hive









Taking honey to soon & to much



Before winter hive should weigh 155lb – 160lb with two deeps.

Minimum amount is equal to one full deep box: 90lb – 100lb

Medium super: 40lb to 50lb.





Pests, Predators, Parasites, and Diseases

Chapter 4: Varroa Management

Pests

1. Wax Moth
2. Small Hive Beetle
3. Yellowjackets
4. Skunks
5. Bears
6. Raccoons

Parasites

1. Phorid Flies
2. Tracheal Mites
3. Varroa Mite

Diseases

1. Chalkbrood (*Ascosphaera apis*)
2. American Foulbrood (*Paenibacillus larvae*)
3. European Foulbrood (*Melissococcus Plutonius*)
4. Idiopathic Brood Disease Syndrome
5. Colony Collapse Disorder
6. Nosema

Viruses

1. Sacbrood Virus
2. Deformed Wing Virus
3. Black Queen Cell Virus
4. Acute Bee Paralysis Virus Complex

Ask for help 

Varroa Mite
Varroa Destructor
Treatment Schedule



Two types of
Varroa Mite

Varroa Destructor
&
Varroa Jacobsoni



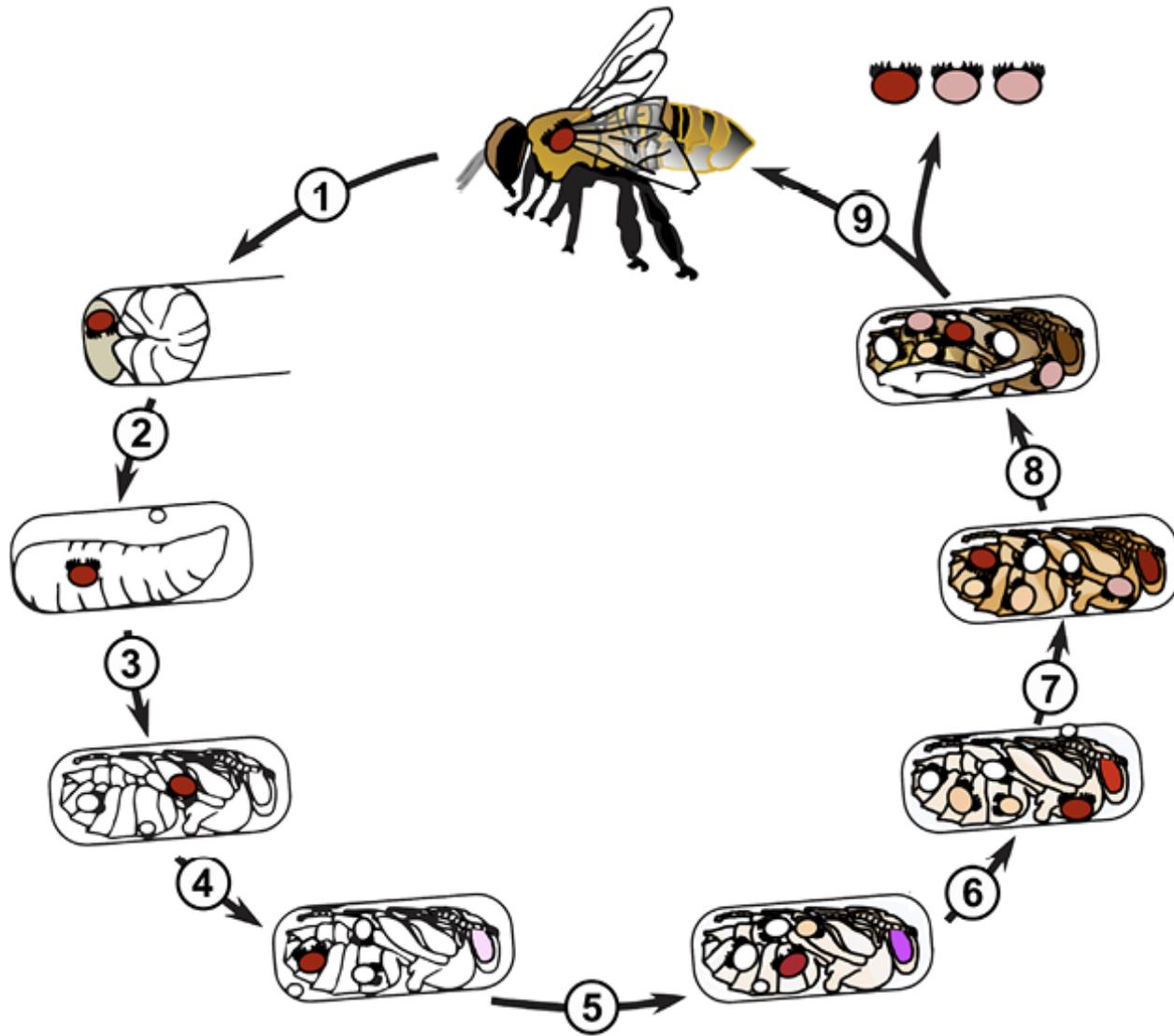




Source: aristabeerresearch.org Gilles San Martin



Varroa Mite Life Cycle



Source: <http://extension.msstate.edu/publications/managing-varroa-mites-honey-bee-colonies>

Source: <https://www.bmdooney.com/>



NCAAT.ORG

Stages of mite life cycle

Phoretic Stage

Mites are found outside the bee's body feeding on the bee. They are often found on the underside of the bees' abdomens tucked between body segments.



Reproductive Stage

The mite is inside the honeybee brood cell, reproducing and feeding on honeybee pupae.



Varroa Mite Impact on Hive

1. They feed on the fat bodies, shortening the bees' lifespan.
2. They transmit viruses through the wounds created in the bee's cuticle by feeding. The viruses can sicken and kill bees.
3. They can suppress the honey bees' immune systems.
4. They can kill entire colonies if mite infestation are left unmanaged. Without intervention, colonies typically die within six month to two years.

Advanced stages of Varroa Mite infestations cause: **Parasitic Mite Syndrome (PMS)**

Symptoms of PMS

1. High mite levels
2. Diseased brood infected with one or more virus
3. Adults with deformed wings (a symptom of deformed wing virus)
4. Adults may also have mites on their bodies.
5. Signs of hygienic behavior: spotty brood, perforated capping's, bald brood etc.

Parasitic Mite Syndrome (PMS)



Deformed Wing Virus (DWW)



Source:
<http://scientificbeekeeping.co.uk/DWW.html>
& Lamas, et al, 2023. (CC-BY 4.0,
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Tropilaelaps Mercedesae will likely be a future risk.

Tropilaelaps mercedesae

An Emerging Threat to Western Apiculture



Example of Varroa Management Schedule



Month	Treatment threshold (mites/100 bees)	Monitoring method you plan to use	Cultural options you will consider	Chemical treatments you will consider
January			1. Colony Spacing	
February			1. Colony Spacing	
March		Powdered Sugar Shake	1. Colony Spacing	1. Oxalic Acid
April	2 / 100	Powdered Sugar Shake	1. Colony Spacing 2. Drone Frame 3. Swarming – Brood Break	1. Apiguard
May	2 / 100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board 3. Drone Frame 4. Swarming – Brood Break	1. Apiguard 2. Mite Away Quick Strips
June	2 / 100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board 3. Drone Frame	1. Mite Away Quick Strips
July	2 / 100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board 3. Drone Frame	1. Mite Away Quick Strips 2. Hop Guard 2
August	3/100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board	1. Mite Away Quick Strips 2. Hop Guard 2
September	3/100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board	1. Apiguard 2. Hop Guard 2 3. Mite Away Quick Strips
October	3/100	Powdered Sugar Shake	1. Colony Spacing 2. Screened Bottom Board + Sticky Board	1. Oxalic Acid
November	3/100	Powdered Sugar Shake	1. Colony Spacing	1. Oxalic Acid
December			1. Colony Spacing	



Thank you!
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