




Welcome!

For the Love of Bees: Introduction to Beekeeping

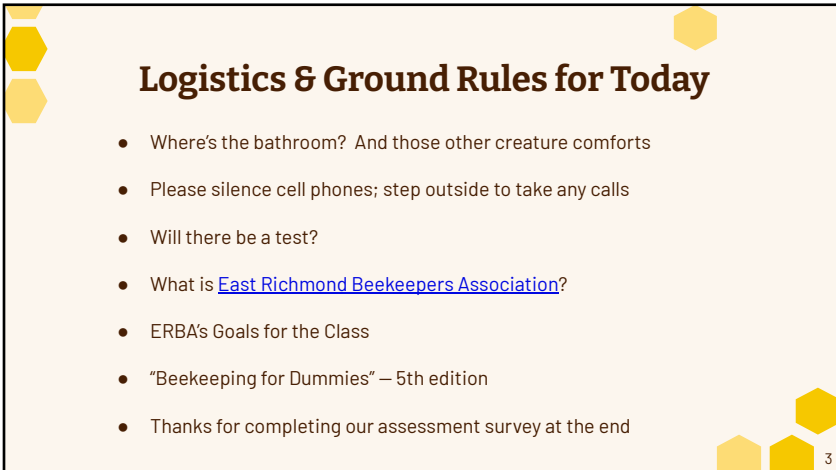
March 9, 2024



YOUR INSTRUCTORS TODAY

1. SUE ROWLAND
2. DOUG ANDERSON (*)
3. CHIP DAHLSTROM
4. MARK SMITH
5. MIKE WOODWARD

*Master Beekeeper



Logistics & Ground Rules for Today

- Where's the bathroom? And those other creature comforts
- Please silence cell phones; step outside to take any calls
- Will there be a test?
- What is [East Richmond Beekeepers Association](#)?
- ERBA's Goals for the Class
- "Beekeeping for Dummies" – 5th edition
- Thanks for completing our assessment survey at the end

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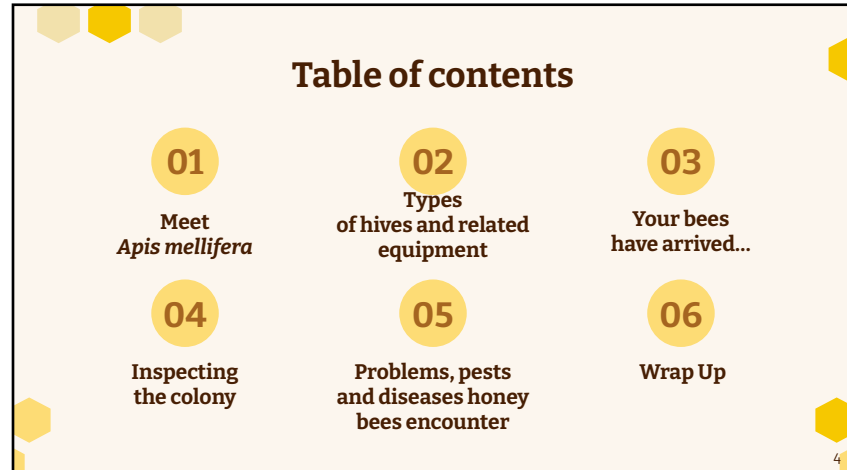


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01 Meet <i>Apis mellifera</i>	02 Types of hives and related equipment	03 Your bees have arrived...
04 Inspecting the colony	05 Problems, pests and diseases honey bees encounter	06 Wrap Up

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01

Meet *Apis mellifera*

Sue Rowland

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What We'll Cover

- Tiny bit of bee history
- Wasps v Bees
- All of our other bees v. honeybees
- Anatomy of the honeybee
- 3 castes of bees
- Bee math
- Pheromones rule

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Oldest *Apis m.*

It's **Not** This One

Trigona prisca, a stingless honey bee found in Cretaceous New Jersey Amber 74-96 m. Yrs ago



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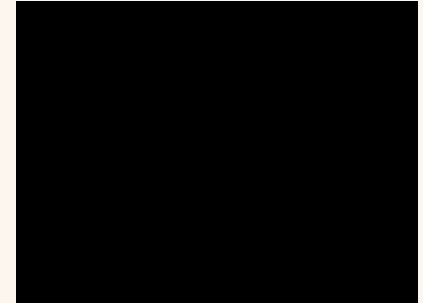
Apis nearctica
Oldest known North American honey bee

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Stingless Bees in Peru: *Melipona sp.*

**Man has been
harvesting
honey for quite
a long time**



Credit: https://youtu.be/Qkqy_U4DKAc?si=oeZLERmvz7XDTrnj

Wasps v Bees

The Wicked Wasp

- Smooth, hard bodies
- Ultra-thin waist
- Don't collect pollen
- Carnivorous as larvae
- Don't store food
- Social & solitary
- Nests in vegetation or ground
- Aggressively protective of the hive; Smooth stingers!

The Sweet Bee

- Fuzzy bodies
- Angular body with long appendages
- Pollen-collecting "hair"
- Pollen & nectar only
- Some store food
- Social & solitary
- Nests in hollows or ground
- Aggression? Depends
- Barbed stingers (if any)

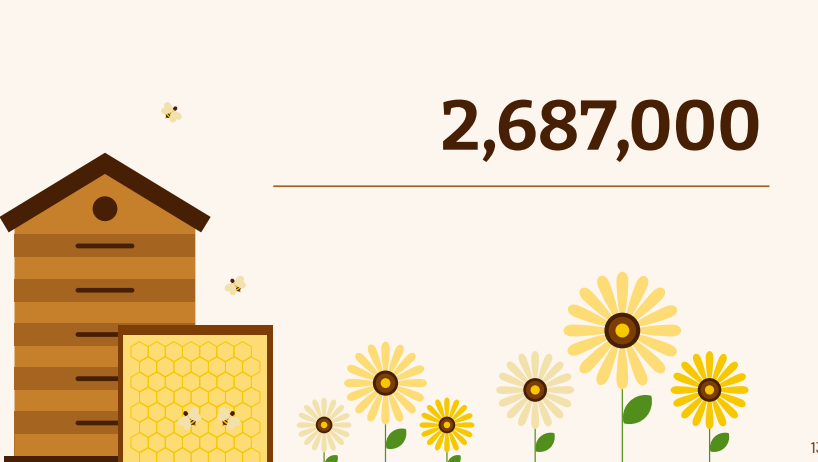


Meet *Apis mellifera*

And why it's important to know:

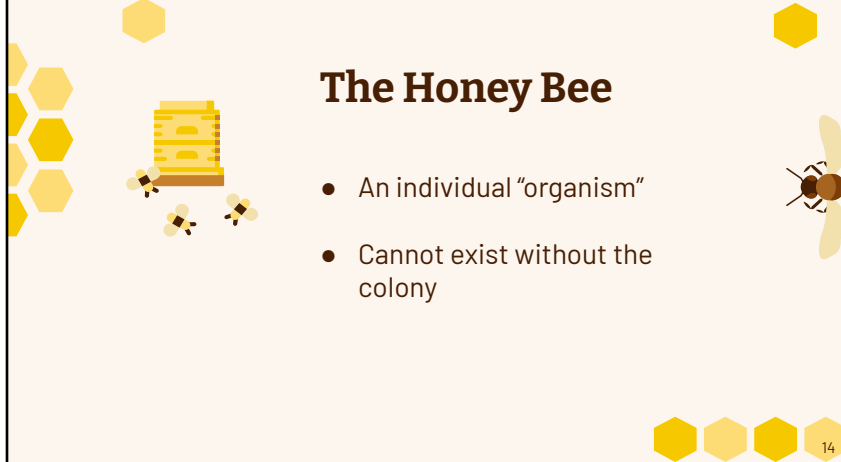
- Bee v colony
- The 3 castes of bees
- Anatomy of the honey bee
- Bee pheromones
- Bee math





2,687,000

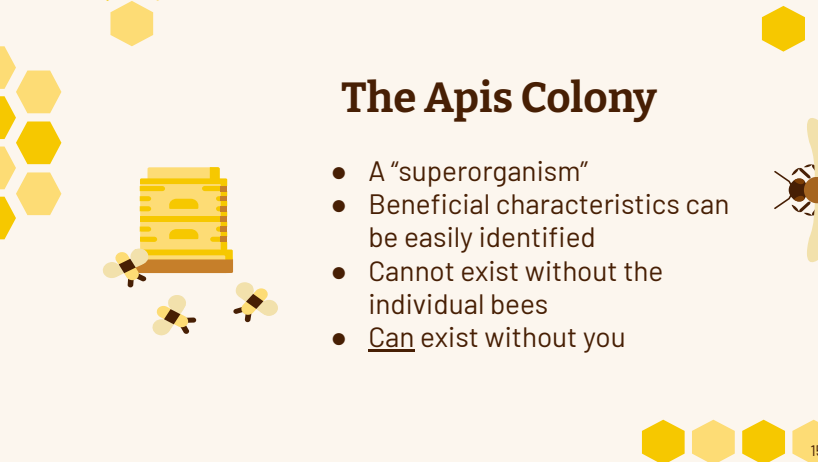
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The Honey Bee

- An individual “organism”
- Cannot exist without the colony

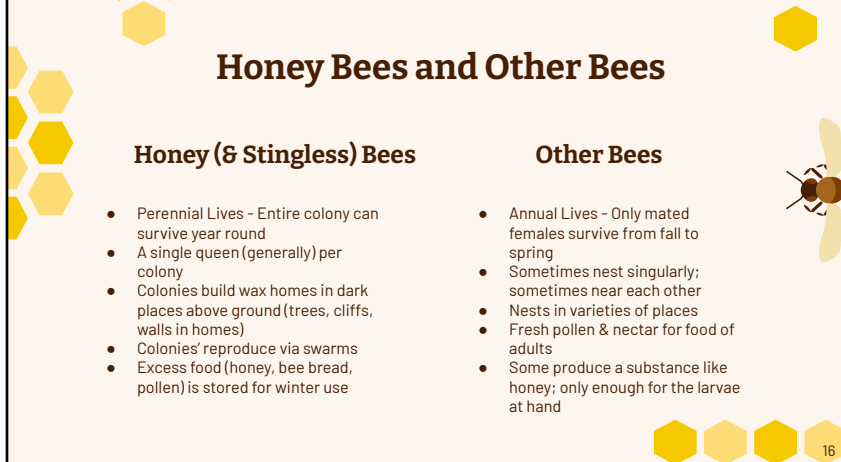
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The Apis Colony

- A “superorganism”
- Beneficial characteristics can be easily identified
- Cannot exist without the individual bees
- Can exist without you

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Honey Bees and Other Bees

Honey (& Stingless) Bees	Other Bees
<ul style="list-style-type: none"> • Perennial Lives - Entire colony can survive year round • A single queen (generally) per colony • Colonies build wax homes in dark places above ground (trees, cliffs, walls in homes) • Colonies’ reproduce via swarms • Excess food (honey, bee bread, pollen) is stored for winter use 	<ul style="list-style-type: none"> • Annual Lives - Only mated females survive from fall to spring • Sometimes nest singularly; sometimes near each other • Nests in varieties of places • Fresh pollen & nectar for food of adults • Some produce a substance like honey; only enough for the larvae at hand

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Three “Castes” of Honey Bees



WORKER

- Vast majority in the colony
- Recall the definition of “EuSocial” insects
- Nurse Bees & Foragers
- Colony’s defenders
- Live 6 weeks in summer & a few months in winter



QUEEN

- Two Functions
 1. Lay viable eggs
 2. Make chemicals to maintain colony cohesion
- 1 per colony, usually
- Live 2+ years



DRONES

- One function = to mate with virgin queens
- Haploid, not diploid
- Feed on pollen in the hive & beg workers for food
- Fly each afternoon to DCAs
- Complete one task, then die

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BEE MATH

	DRONE	WORKER	QUEEN
EGG	3	3	3
LARVA	7	6	5.5
(capped)	(8)	(6)	(6)
PUPA	14	12	7.5
ADULT	24	21	16

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Credit: <https://www.youtube.com/shorts/IjGa380AVJdGY?feature=share>

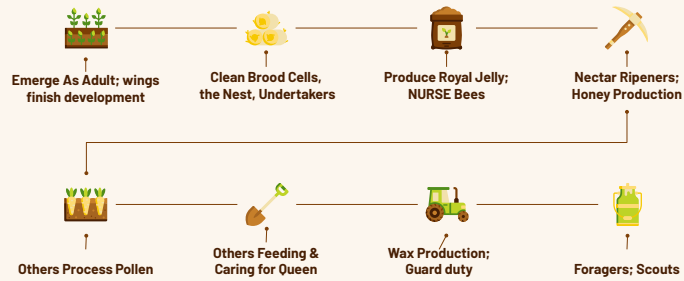
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What is that?



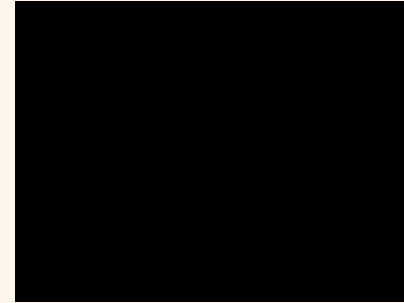
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WORKERS' JOBS



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Worker's First Jobs



Credit: <https://fb.watch/qz6q4WPoga/>

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Nurses become Foragers

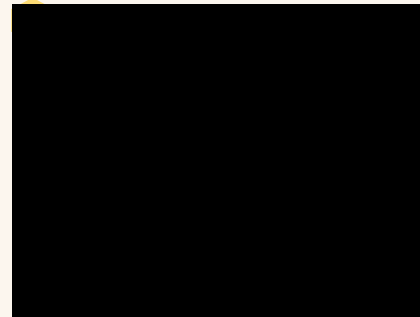
Let's take a look at the orientation flights of the worker bees who are soon to become foragers.



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The Waggle Dance

Fly This Way and about That Far



Credit: <https://youtu.be/bFDGpXtK-U?si=AwkAxFLpWFxl21s>

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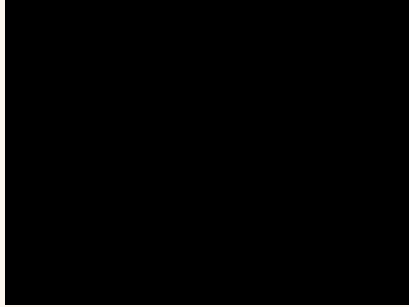
Other Bee Behaviors

It's HOT in There ...

The Bump

Noises From the Colony

OUCH!



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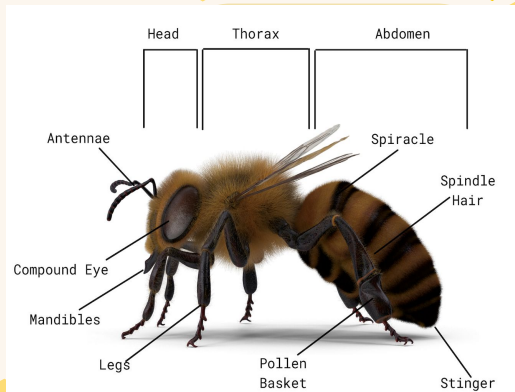
These are Drones



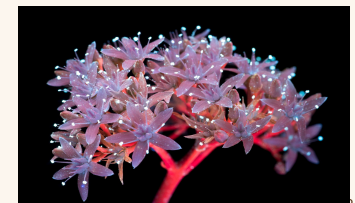
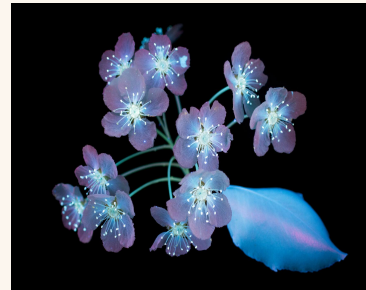
"All they do is eat, beg, eat some more, get in the way, fly around, and mate with the virgin queens waaayyy up there in the sky." (Unnamed source)

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Honey Bee Anatomy



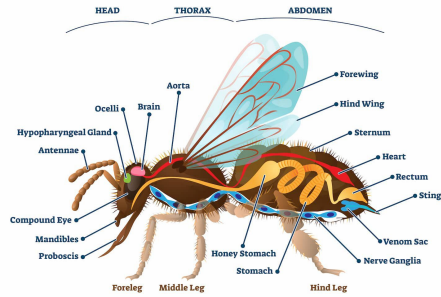
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"WHAT THE BEES SEE"
By Craig P. Burrows

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ANATOMY OF A BEE



Another View

Credit: <https://images.app.goo.gl/o3k7otBCfxeLTn466>

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BEE PHEROMONES

Two Types

1. Primer pheromones
2. Releaser pheromones

Primer

"Act at a physiological level, triggering complex and long-term responses in the (bee) receiver; generating both developmental and behavioral changes"

Releaser

"...[h]ave a weaker effect, generating a simple and transitory response that influences the only at the behavioral level."

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Bees Use Pheromones to Communicate Needs and Wants

QUEENS

- The "Queen Substance"
- Mostly Primer Pheromones
- Her own gland
- Telling the colony "I'm Here, doing my job"
- Low or No Queen Signals result in workers establishing queen cells; or other unfortunate behaviors

WORKERS

- Caste-specific
- Nest-mate recognition
- Brood care**
- Where's the water
- Where's the nectar
- "Footprints" at the entrance
- Alarm pheromones
- Time to Kick Out the Drones
- Direct swarming
- And a lot more

DRONES

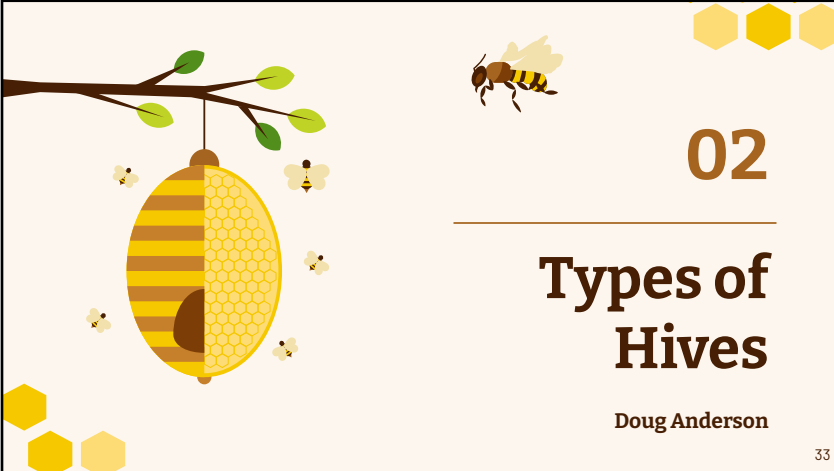
- Attract other flying drones to Drone Congregation Areas (DCAs)
- Acceptance in the colony

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Bee Math

	Worker	Queen	Drone
Egg	3	3	3
Larva	6	5.5	6.5
Pupae	12	7.5	14.5
Total	20-21	15-16	21-24

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02

Types of Hives

Doug Anderson

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Types Of Hives

And why it's important to know:

- The types of hives
- Woodenware
- Frames & foundations
- Prepare to add space
- Beekeeping tools

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Types of Hives

- Langstroth (page 68)
 - Invented 1852 by Reverend Lorenzo Langstroth
 - Invention of "Bee Space" makes it possible
- Kenyan Top Bar Hive (page 70)
- Apimaye Insulated Hive (page 73)
- The Flow Hive (page 75)
- Warré (People's) Hive (page 78)
- Five-Frame Nuc Hive (page 81)
- Observation Hive (page 83)

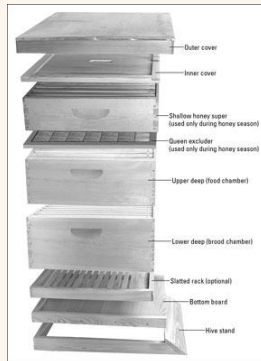
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Langstroth Hive

- Reverend Lorenzo L. Langstroth (1810-1895)
- Discovery of "bee space" allowed interchangeable parts
- Readily available from any supply vendor
- Removable frames allow easy inspections
- Available in 8-frame & 10-frame configurations in both deep and medium

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Parts of the Hive (page 94)



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Hive Stand



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Bottom Board



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Entrance Reducer

- Limits bee access to the hive
 - Protects the colony from neighboring colonies (robbing)
- Controls ventilation & temperature
- Two different sized notches on different sides.



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Slatted Rack (optional)

- Used between bottom board and bottom hive body
- Prevents drafts up into the hive
- Allows the bees to use the full frames for brood



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Hive Body

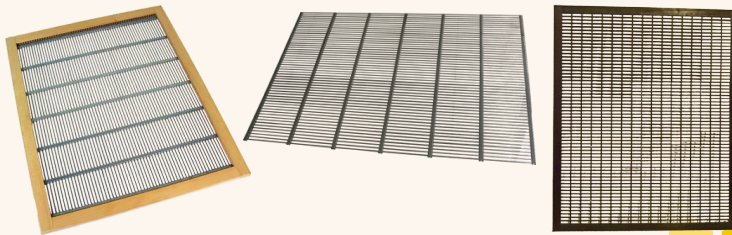
- Two deep or Three medium
- 10-frame or 8-frame width



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Queen Excluder

- Placed between hive body and honey supers
- Keeps queen from laying eggs in honey frames
- Wood framed, metal or plastic



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Honey Super

- Medium (6-5/8") or shallow (5-11/16")
 - Shallow used mostly for cut-comb honey
 - Shallow rarely used now
- 10-frame or 8-frame



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Frames

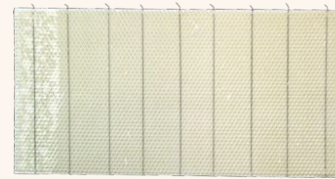
- Wooden
 - Wedge or Groove top
 - Split or Groove bottom
- Plastic



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Foundation

- Plastic
- Beeswax
 - Crimped wire
 - Unwired



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Inner Cover

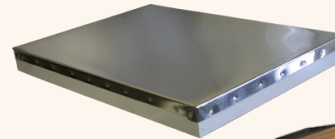
- May be notched
- Typically have an 'up' and 'down' side



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Outer Cover (Telescoping Top)

- Wood with metal cover, plastic, copper topped



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Feeders

- Hive-top feeders
 - Takes place of inner cover
- Frame feeder
 - Replaces 1 or 2 frames



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Feeders

- Entrance Feeder (Boardman)
- Pail Feeder
- Baggie feeder



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Assembling Your Hive

Hive Body Assembly

- Gluing and nailing woodenware greatly increases strength & longevity
 - Titebond III glue
- Use a square to ensure parts align
- Can use deck screws or 2" 6d coated nails
 - Nail size not critical
 - 16 ga. Finish nails using air tools



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Frame and Foundation Assembly

- 4 Parts
 - Top bar
 - Bottom bar
 - Two side bars
- Can use 18-gauge brads or staples
 - 1-1/4" x 1/4" crown staples
- Use glue in joints to increase strength
 - Titebond III glue

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Painting

- Use at least two coats of good quality outdoor latex or oil-based paint
- Lighter colors keep hive cooler during summer
- Can stain with outdoor grade polyurethane
- Do NOT paint:
 - Inner cover
 - Frames
 - Inside surfaces of hive bodies, supers and wooden hive-top feeders
 - Queen excluder

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Tools

Smoker

- All shapes & sizes
- Recommend with a guard to prevent burns



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Hive Tools

- Various shapes & configurations



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Frame Lifter

- Helps remove initial frame during inspections



58

Frame Rest/Perch

- Used to hold frames during inspection
- Keeps them clean and in order



59

Bee Brush

- Used to remove bees from frames
 - During inspection
 - During honey super removal



60

Jackets, Suits & Veils

- Different styles & types of veils



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Gloves

- Nitrile gloves
- Leather gloves
- Plastic-coated gloves



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03

Your Bees Have Arrived

Chip Dahlstrom

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Your Bees Have Arrived

And why it's important to know:

- Packages vs Nucs
- Number & location of hives
- Installing bees
- Feeding bees & why
- What to expect this Spring



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Sourcing Decisions

- Which race of bees
- Package vs NUC
- Find supplier
- How many hives?



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Races of Bees



TABLE 6-1 Characteristics of Various Common Honey Bee Types

Bee Type	Gentleness	Productivity	Disease Tolerance	Wintering in Cold Climates
Italian	1	1	2	2
Saskatraz	1	1	1	1
Russian	1	1	1	1
Carniolan	1	2	2	2
Caucasian	1	2	2	1
Buckfast (hybrid)	2	2	1	1
Cordovan (hybrid)	1	3	2	3
Africanized	3	1	1	3

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Package vs NUC (page 135-136)



Package:

- Ordered by the pound (e.g., 1-5 lbs – ideal size is 3 lbs)
- Arrives in wooden (or plastic) box with screened sides
- Small screened cage for the queen
- Tin can of sugar syrup for feeding

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Package vs NUC (pg 135-136)

NUC:

- Active small hive with brood, bees and young active queen
- Typically 4-5 frames
- Overwintered
- Small wooden, cardboard or plastic hive

Other Options:

- Swarms
- Established hives



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Package vs NUC

Pros	Cons
Package	
<ul style="list-style-type: none"> • Available early spring • Economical • Easy to ship • Cost (\$140-\$190) 	<ul style="list-style-type: none"> • Slow growth (21 days to first eggs emerge) • Queen not related to hive • Less chance of extra honey 1st year
NUC (Nucleus Hive)	
<ul style="list-style-type: none"> • Existing/fully functional hive: <ul style="list-style-type: none"> ○ Laying queen ○ Comb of eggs/larva ○ Comb of honey/pollen 	<ul style="list-style-type: none"> • Cost (\$190-\$250)

Page 134

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Locating Bee Source

Choose local (where possible):

- No long distance shipping
- Bees successfully living in geographic area
- Get to know your supplier

When to order:

- Order early - first ordered-first delivered
- Order typically November-January
- Delivery mid-March to May



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How Many Hives?

- Recommendation: Two hives
- Additional hives can be too much for new beek
- Allows you to compare/contrast (growth, temperament)
- Share resources (brood for queen replacement)



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Location, location, location...

Consider:

- Bees travel great lengths to forage
- City/Neighborhood Association ordinances

Placement:

- Flat/dry land
- Easy access & space to work
- Sunlight (dappled-avoid deep shade)
- Face South-to-Southeast
- Wind breaks on North & West sides
- Elevate on sturdy stand
- Predator (e.g., bear) protections



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Final Preparations

Consider:

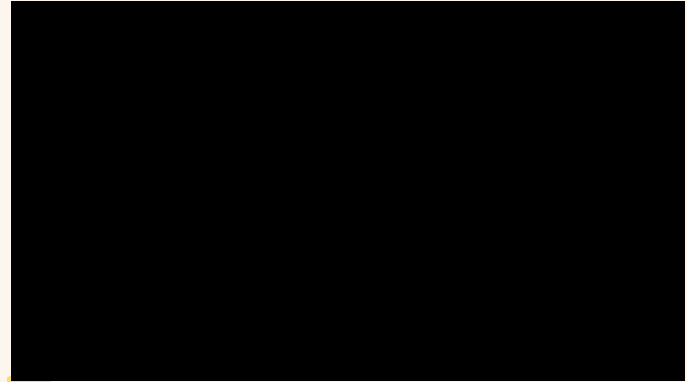
- Make 1-1 sugar syrup ahead of time
- Don't transfer in front of car
- Inspect package/NUC
- Keep package/NUC cool (not cold) and dry
- Plan to install within 2-3 days max
- Install on sunny afternoon (if possible)



Suit up and here we go!!

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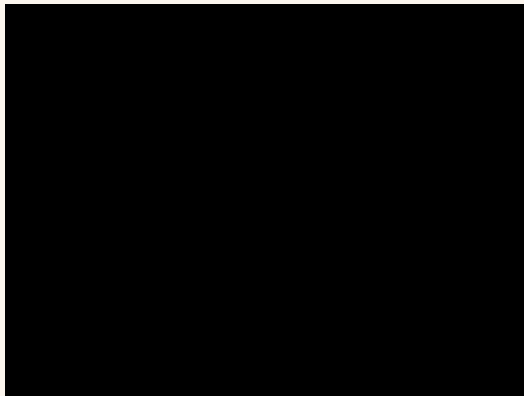
How to install a Package of Bees (Randy Oliver) - 4 ½ minutes



See pages 142-150

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How to install a Honey Bee Nuc (Black Fork Bee Club) – 11 minutes



See pages 142-150

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How to make sugar syrup

Recommendations:

- Mix in clean 5 gallon bucket
- Make ahead of need
- Hot tap water to make 1:1 and boiled water for 2:1
- Consider adding supplements (i.e., Honey-B-Healthy, cider vinegar)
- Use drill and paint mixer to blend
- Place in Orange Juice or similar jugs
- Store at room temperature



Also see page 143

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How to make sugar syrup



Also see page 143



Sugar/Water Ratios for Feeding Bees

Don't Make Deadly Mistakes
Mixing pure cane sugar with water is a common method of feeding bees. Different ratios are used to promote different targets.

These are guidelines not rules.

1:1	ENCOURAGES BROOD REARING & COMB BUILDING		
1 to 1 mixture of sugar water is - equal parts of sugar and water.			
8 lbs (16 1/4 cups) sugar to 1 gallon (128 oz) of water	4 lbs (8 cups) sugar to 1/2 gallon (64 oz) of water	2 lbs (4 cups) sugar to 1 quart (32 oz) of water	1 lb (2 cups) sugar to 1 pint (16 oz) of water
2:1	ENCOURAGES FOOD STORAGE - HONEY FOR WINTER		
2 to 1 mixture of sugar water is - 2 parts sugar and 1 part water.			
16 lbs (32 1/2 cups) sugar to 1 gallon (128 oz) of water	8 lbs (16 1/4 cups) sugar to 1/2 gallon (64 oz) of water	4 lbs (8 cups) sugar to 1 quart (32 oz) of water	2 lb (4 cups) sugar to 1 pint (16 oz) of water

Bee Safety Alert!
Some beekeepers heat water to aid in dissolving dry cane sugar. Use care - do not cook sugar water. This could result in sick/dead bees.
It is not necessary to heat water for 1/1 Sugar Water.

©Carolinahoneybees.com 77

Water Feeding

Recommendations:

- Is there a nearby source of water (i.e., pond)
- Repurpose dog, chicken or song bird waterers
- Prevent drowning
- Don't let it run dry



Page 61-63



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Feeding the Bees

Sugar syrup feeding:

- Select feeder type
- Feed until:
 - Comb drawn out all frame foundations
 - Bees stop consuming

← Feeder types: slides 49-50

Water feeding:

- Boardman feeder, chicken feeder, or bird bath
- Place 25 feed or so away
- Community feeder...



See pages 112-117



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What to Expect Next...

3-5 Day Inspection (Pages 183-185):

- Queen released (package)
 - If not, poke candy or remove it
- Comb construction
- Cells: syrup, brood, pollen
- Refill feeder

See beekeeping calendar: page 211-212



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What to Expect Next...

2-3 Week Inspection (pages 155-188):

- Eggs, larvae, capped brood
- Food stores: syrup/honey, pollen
- Emerging workers
- Laying pattern
- Refill feeder(s) (as necessary)
- Add additional hive boxes

See beekeeping calendar: page 211-212

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04

Inspecting the Colony

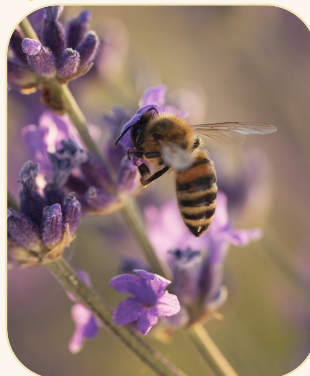
Mark Smith

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Inspecting The Hive

And why it's important to know:

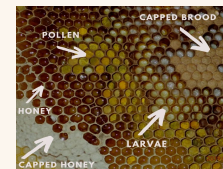
- Why inspect
- Steps of inspections
- First eight weeks
- Smoker is your friend
- Spotting orientation flights



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Why Inspect Your Hive

- Is the queen present
- Presence of eggs, larva, and capped brood
- Evidence of potential swarming
- Honey/pollen stores
- Signs of swarming – queen cups/cells
- Need for honey super
- Extraction
- Disease/infestation



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Opening Hive

- **Visiting hours:** 10:00 to 5:00
 - Sunny
 - Avoid cold; less than 50 degrees
 - Avoid rainy / windy weather
- **Personal hygiene:**
 - Avoid after working out
 - Avoid perfume; scents
- **Safety:**
 - Wear veil
 - Jacket
 - Jumpsuit
 - Gloves



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Smoker is your friend: Purpose

- Change bees behavior
- **Theory:** smoke masks the “alarm” pheromones
- Minimizes defensive action



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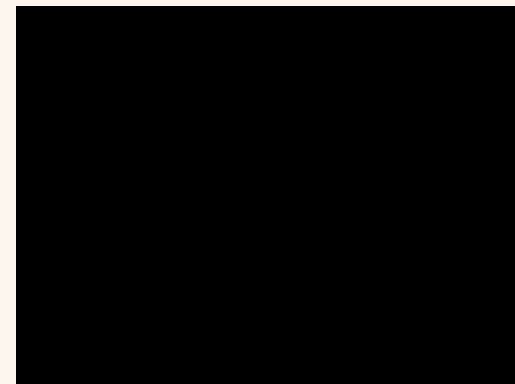
Smoker is your friend: Lighting

- Seeking thick, cool smoke
- Matchstick-size kindling to pinky-size twigs
- Once crackling, add burlap, blue jeans or smoker pellets
- Top with dry leaves or pine needles
- No synthetic or toxic materials



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How to light your smoker (*Beekeeping For Dummies*)

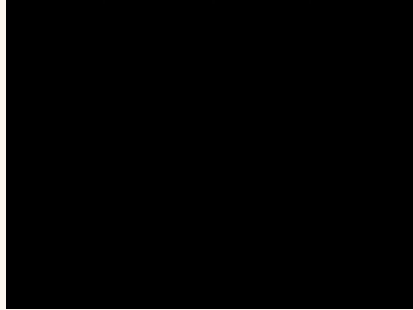


Credit:
<https://youtu.be/Mii55q7Nt50>

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Inspection: Opening the hive

1. A few puffs from the smoker at entrance
2. Lift hive cover → blow a few puffs → close for 20 seconds
3. Remove top cover and inner cover



How to open your beehive (Beekeeping For Dummies) 89

Credit: <https://youtu.be/uL6yziDuqXA>

Inspection: Opening the hive

4. **Remove first frame:** provides needed open space inside the hive
5. **Technique:** Use both hands; avoid rolling bees; consider a frame rack; be extra careful with frames without foundation
6. **Greatest Compliment:** You have a calculated and deliberate approach



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Inspection (continued)

7. **Inspect both sides of frame:** Look for positive activity and problem issues
8. **Inspect as many frames as needed to satisfy your purpose:** *you don't always need to find the queen*



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Inspection (continued)

9. **Return frames:**
 - Slow and deliberate
 - **Keep in the same order** (advanced techniques later)
 - Keep frames tight with each other
 - Leave space for last frame, ensuring that it is no too tight
10. Repeat puffs of smoke, as necessary, to close hive
11. Replace inner cover and top cover



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When to open hives

- **First year beekeeper:** every 7-10 days
 - Familiarity; learn personality
- **More experienced beekeeper:** 6-8 inspections a year
- **Downside of inspections:** chance of killing bees/queen; sets back productivity

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When to open hives

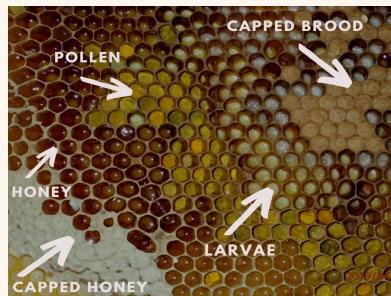
- **First inspection:** most guides recommend 7 days
 - If your colony comes with a queen in a separate cage, it is recommended that you check to see that she has been released after three days
 - Look for eggs and drawn comb



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When to open hives (*continued*)

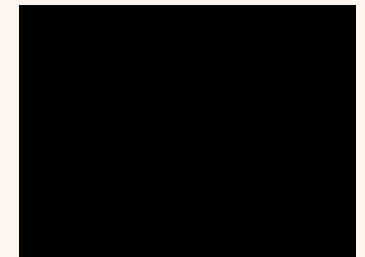
- **Weeks 2-3:** Look for larva and capped brood; evaluate your queen
- **Weeks 4-8:** Continue to monitor eggs, larva and capped brood; also note pollen and honey stores; watch for orientation flights
- **Adding super** – 8:10 rule or 6:8 rule



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Orientation Flights

- Orientation flights should not be confused with swarming
- Young bees first flights
- Face hive
- Dart up and down in front of hive/entrance
- Some circling; circles widen
- Imprint of hive location
- My experience is that orientation flights happen later in the afternoon

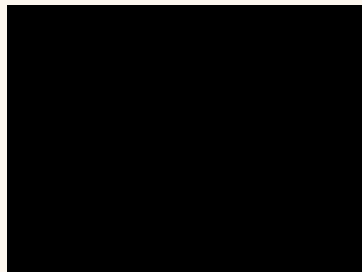


Credit: <https://www.youtube.com/shorts/0uj1HSy2Ttk>

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Helpful Hints

- Remove burr comb
- Have a sharpie during inspection
- Keep a journal



Credit: <https://youtu.be/E9V2qxIU3e0>

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05

Problems Bees Encounter

Mike Woodward

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And now the Bad News...

Bad things can happen.....

- There will be Problems
- Pests will pester you
- And, even Diseases are a factor
- But, there are answers

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Remember, this Training is a Multi-Day endeavor!

- In our next session, we will cover all of these issues in depth
 - Using "hands-on examples" of what to look for
 - And, offering prevention and solution tips and techniques

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But, there are ways to identify, and remedy those!

- ERBA can help with all of those bad things
- Let's take a "high level" look....!



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Problems will occur

And why it's important to know:

- Swarming
- Absconding
- Robbing
- The Queen "est morte"!
- And, a few other bad things!



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Pests will Pester You!

Dastardly creatures such as:

- Varroa Mites
- Wax Moths
- Small Hive Beetles
- Ants
- Bears, Raccoons, Skunks, Mice, and Humans

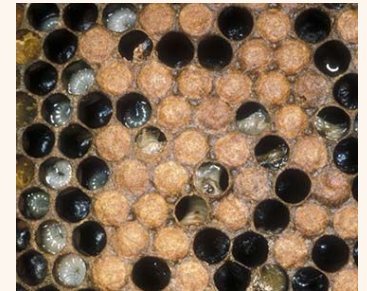


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Diseases are possible!

And these are as bad as they sound...!

- American and European Foulbrood
- Chalkbrood
- Sacbrood
- Nosema



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Here's some information on some of those problems

- Swarming
- Small Hive Beetles



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Swarms



Swarming

- Queen & 50% of the bees leave the hive
- Gorge themselves on honey before leaving
- Chance of a honey harvest is slim
- Need to make a new queen
- If swarm late in season, may not be able to recover before winter

Swarms



What causes swarming?

- Congestion
- Poor ventilation
- A poorly performing queen



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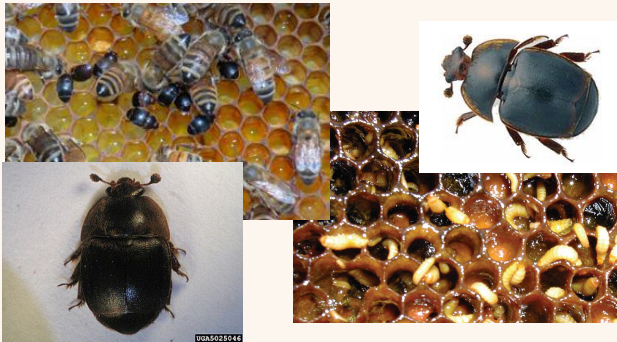
What can we do about it

- Add additional Hive Bodies
- Provide adequate ventilation
- Supply a nearby water source
- Keep the hive out of a full day of blazing sun
- Respect the Queen



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Small Hive Beetles– *Aethina tumida*



Small Hive Beetle Damage

- Larvae
 - Tunnel through comb
 - Destroy cappings
 - Defecate in honey
 - Fermentation of honey
- Results
 - Honey discoloration, fermentation & frothing
 - Leaking honey from comb
 - Destruction of wax frames and cappings
 - Absconding of bees

Small Hive Beetle Life Cycle

- Egg
 - Hatch in 2 to 3 days
 - Deposited as irregular masses in crevices and cavities
 - Approximately 2/3 size of Honey bee egg
- Larvae
 - White colored worms
 - Grow to length of 10 to 11 mm
 - Feed on honey and pollen
 - Require 10 to 16 days of development

Small Hive Beetle Life Cycle

- Pupae
 - Larvae leave hive to pupate in soil
 - Pupation require 3 to 4 weeks
- Adult
 - Reddish brown to black in color
 - 5 mm in length
 - Live up to 6 months

Small Hive Beetle Control

- What can be done
 - Monitor hives for beetle presence
 - Maintain strong hives
 - Maintain good sanitation during honey extraction
 - Never store wet supers
 - Maintain a Dry environment
 - Move Hives away from tree lines



Small Hive Beetle Control

- Chemical
 - Check-Mite+
 - Gard-Star
- Physical traps
 - Beetle Blasters
 - Unscented dryer sheets



Next time....!

- In our next session, we will cover all of these issues in depth
 - Using “hands-on examples” of what to look for
 - And, offering more prevention and solution tips and techniques



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Time to Wrap Up

Sue Rowland

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SO
WHAT
DID
YOU
LEARN
TODAY?



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Fun Facts about Bees

Honey bees & 1622

30% of food consumed
pollinated by bees

The Value of that work =
\$16B in the US alone

So do bees sleep or not?

Honey Bee Health
Coalition (add “.org”)



The **Virginia State Beekeepers Association** puts on statewide meetings once a year. Join up to get the notices!

Keith Tignor is Virginia's State Apiarist. Find him at Keith.Tignor@vdacs.virginia.gov

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Prior to the next beekeeping session



Record-keeping

Prepare to keep records of what you find each time you inspect a hive. Important to have the data when you've got a question or issue.



Bee Suit

Use all the gear all the time, at least at first. (Bring your personal protection gear to the next session.)



ERBA

Attend ERBA meetings. First Tuesday of each month @ 7:00 pm. Sandston Presbyterian Church, 13 North Confederate St.



VSBA

Join VSBA!
VirginiaBeekeepers.org



Get a Mentor

Through ERBA, you can request a Mentor. Someone with at least some more experience can really help.



Enjoy!


Beekeeping can be a most rewarding experience as a hobby or a vocation.

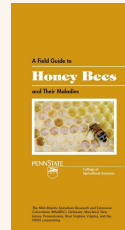
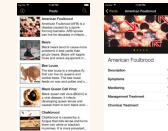
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Resources

- Honey Bee Health Coalition
 - <https://honeybeehealthcoalition.org/>
 - Tools for Varroa Management document
 - Located on your thumb drive



- Field Guide to Honey Bees and their Maladies.pdf
 - Located on your thumb drive
- Bee Health App 



What's Coming Up

Next 3 beekeeping training sessions:

- July 20
- October 19
- February 22, 2025

Same location:

Fairfield Middle School (Henrico Co. School)
5121 Nine Mile Road, Richmond

Thanks!

Do you have any questions?

- Email: EastRichmondBees@gmail.com
- Website: EastRichmondBeekeepers.org
- Facebook: facebook.com/ERBABees/

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Thanks
to our presenters!

Doug Anderson
Chip Dahlstrom
Sue Rowland
Mark Smith
Mike Woodward



*“The right person
to keep bees is
someone who's
interested in
learning that
magic.”*

Susan Cormier of British Columbia