

Hive Inspections: When Things Go Wrong (and how to right them)

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Cornell Master Beekeeper
Rutgers Master Gardener
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Photo credit: Getty Images

When Things Go Right

🐝 Colony is queen-right



Photo credit: Cornell Master Beekeeper Course, "The Art and Science of Beekeeping", "Queen Management", "Using Local Queens"

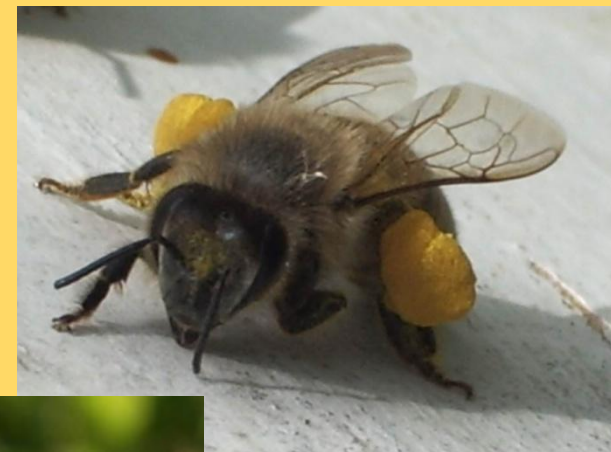
When Things Go Right

- 🐝 No obvious symptoms of disease
- 🐝 Beautiful brood pattern
- 🐝 Pollen stores
- 🐝 Nectar stores



Photo Credit: Karen Sabath

When Things Go Right




 Bees forage for nectar, pollen, water and resins.



Photo Credits: Jean Miller

Even swarms indicate “Things are Going Right”

When Things Go Wrong

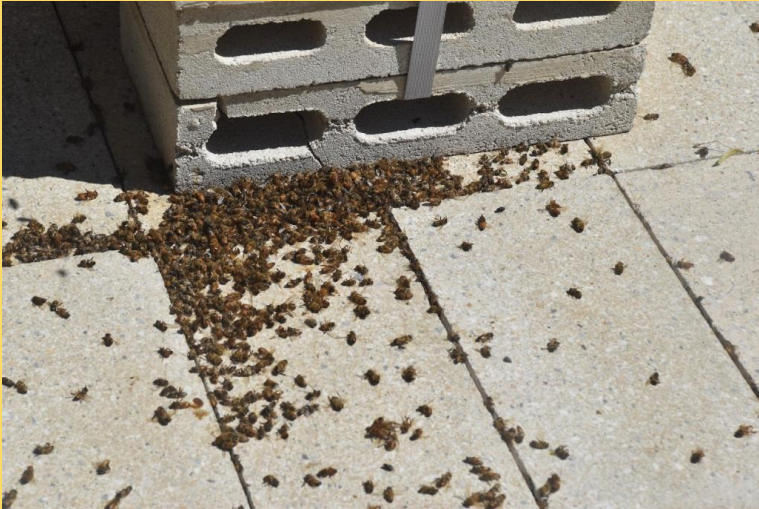


Photo credit: Karen Sabath

Unusual number of dead bees/brood outside of hive.

Like
what???

Colony sounds
very LOUD upon
opening. Bees are
aggressive.



Photo credit: Karen Sabath

Brood doesn't look
"right".



Photo credit: Bee
Informed
Partnership

Photo credit:
Karen Sabath

Too many pests – small hive beetles,
wax moths, yellow jackets, ants, and
WORST of all Varroa mites!

Or....no live bees in hive. ☹️

Steps in an Inspection

1. First, **observe from the outside** of the hive.
2. Then **look inside** the hive to unlock the story.
3. **Delve deeper** in the hive and test for problems.
4. **Record** what you saw during or shortly after inspections.



Photo credit: Jean Miller

Make it a goal to do the first three steps within a 15 minute inspection. Hard at first. Becomes easier with experience.

When Things Go Wrong – Outside the Hive – Some Obvious (Predator) Ones!



Bear:

- ☼ Consumes brood (& honey).
- ☼ Can kill a colony.
- ☼ Prevention – Electric fence.



Raccoon:

- ☼ Remove top covers. Lift frames out and eat brood and honey. Do not smash supers like bears.
- ☼ Preventions – Low electric fence, strap hives, put heavy item on top (brick, rock,...)



Skunk:

- ☼ Scratch marks at ground in front of hive or at entrance.
- ☼ Spit out bee exoskeletons.
- ☼ Preventions - Elevate hive or fence it.

Mouse Damage



Potential Threat: Pygmy Shrew!

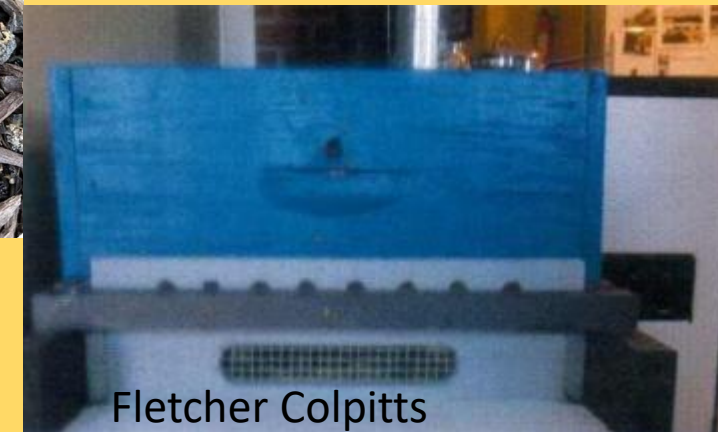


<http://www.mammal.org.uk/pygmyshrew>

Decapitated bees found on bottom board and at entrance of hive.

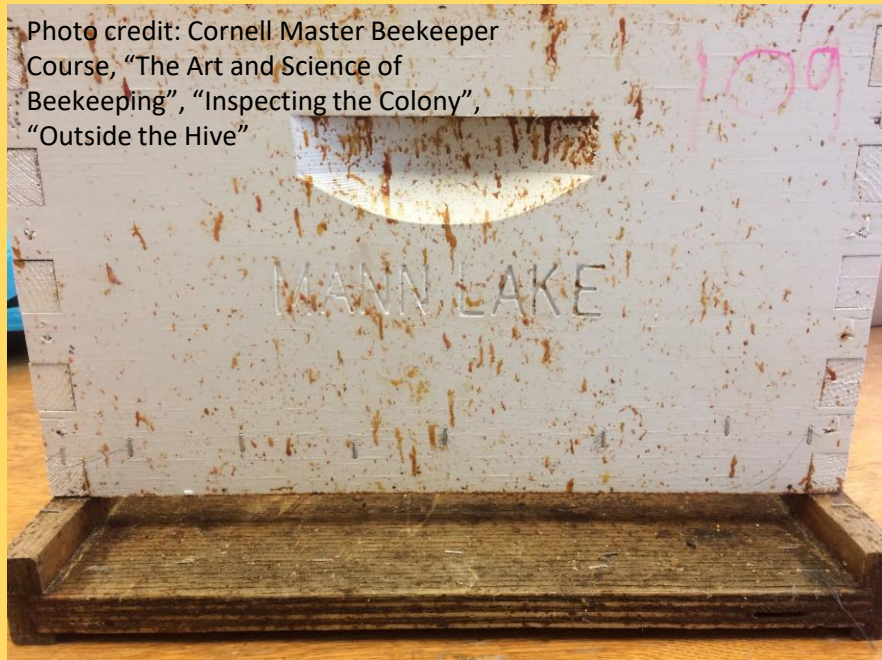


Solution – Install 1/2" Mouse Guard ("September-ish").



Solution - 3/8" Shrew Guards before clustering occurs.

When Things Go Wrong – Outside the Hive



Fecal Matter:

- ☼ A little is ok. Too much (as shown) means something is wrong.
- ☼ Can be a symptom of disease.



Dead Bees/Brood:

- ☼ A little is ok.
- ☼ Causes can include -
 - Disease (often twitching/crawling)
 - Robbing
 - Pesticide poisoning

When Things Go Wrong – Outside the Hive

What is the level of activity?

- 🐝 Is it appropriate for the time of year/day?

What does the activity at the entrance look like?

- 🐝 Is it 'normal' or 'frenzied' or below expectations?
- 🐝 Do you see pollen on returning foragers?



Jean's tip she "learned the hard way" – Don't paint bottom boards yellow. Makes it harder to see pollen on incoming bees.

OK Things to See Outside of Hive



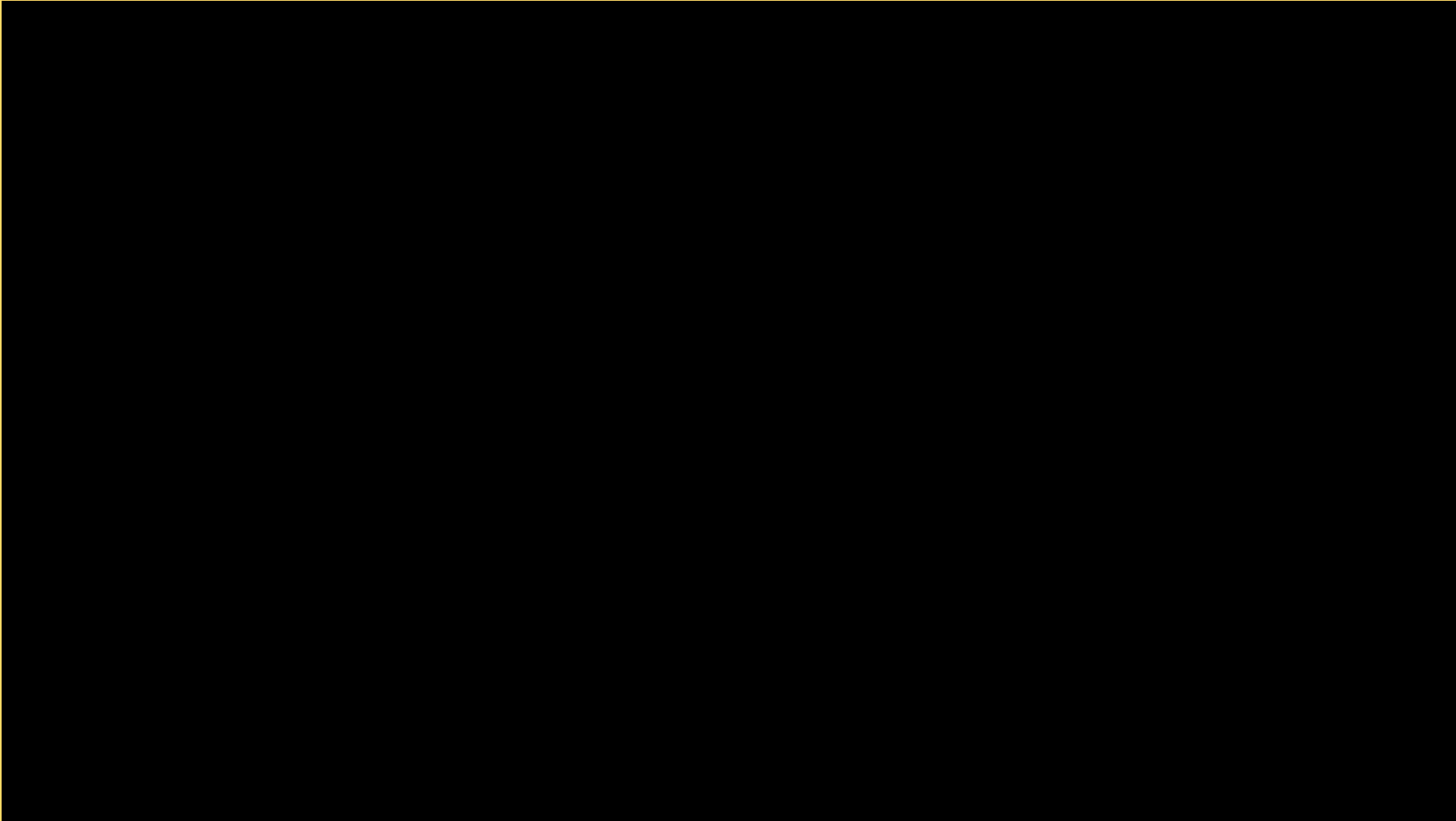
- 🐝 **Orientation Flights:**
New forager bees “float” outside hive to orient themselves with hives location.
- 🐝 **Bearding:**
Too hot (add ventilation)
Too crowded (add room or split)
Treatment (i.e. Formic Pro) just applied.
- 🐝 **Swarming:**
Thousands of bees come out of hive and, in a group, fly not very far away to bivouac until scout bees find a permanent home.
- 🐝 **Washboarding:**
Reason is unclear.

When Things Go Wrong – Outside the Hive - ROBBING!



Video Credit: Emma Kate Mullen (Cornell University)

When Things Go Wrong – Outside the Hive - ROBBING!



Video Credit: Emma Kate Mullen (Cornell University)

When Things Go Wrong – Outside the Hive - ROBBING!

Robbers (other honey bees or yellow jackets):

- ☼ Attack weaker hives
- ☼ Can be more common during a dearth.

Signs:

- ☼ Frenzied activity.
- ☼ Wrestling/stinging.
- ☼ Robbers enter any opening including cracks.
- ☼ Waxcappings/dead bees at entrance.
- ☼ Honey colored footprints.



Photo credit: Cornell Master Beekeeper Course, "The Art and Science of Beekeeping", "Safety and Biosecurity in the Bee Yard", "Robbing"

Wax cappings ripped open by robbers.

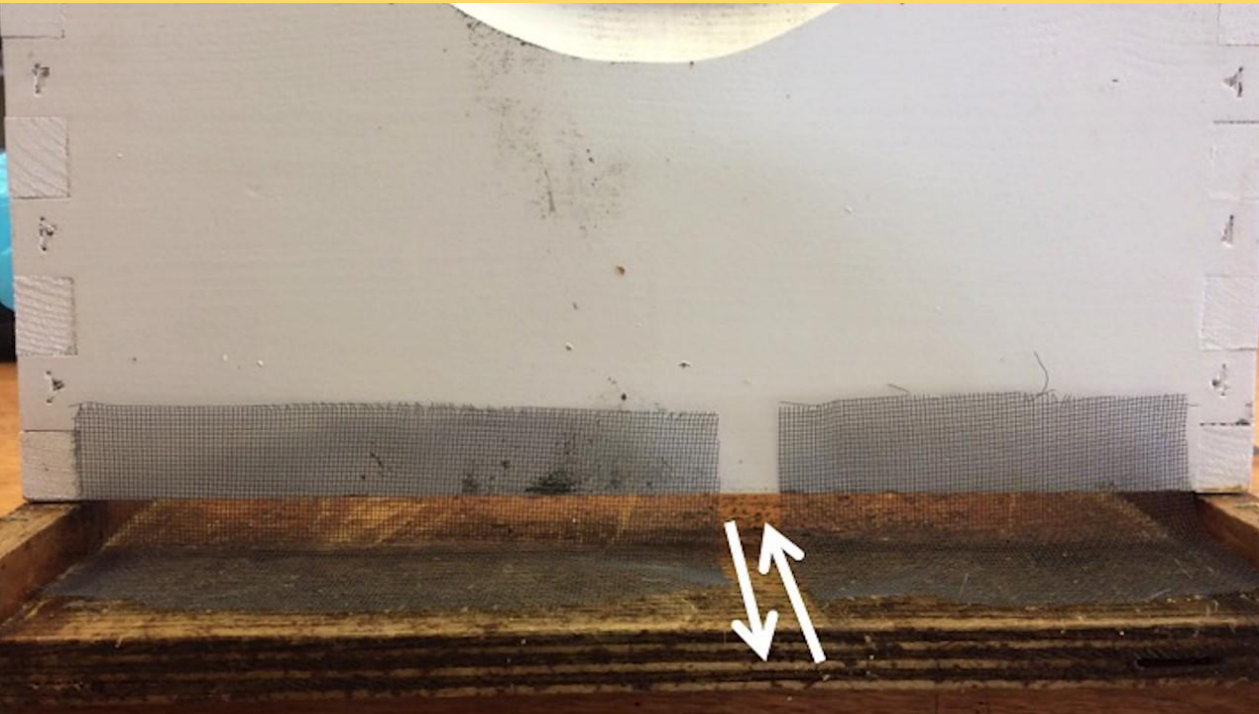
When Things Go Wrong – Outside the Hive - ROBBING!

Deal with IMMEDIATELY!

- ☛ Robbing can kill weak colonies.
- ☛ Robbers can bring pathogens/parasites back to home colonies.

Solutions:

1. Reducing the entrance to ~1/2" (screen, wood, robbing screen)
2. Light colored wet sheet over it (1-2 days)
3. Move colony at least 2 miles away



Outside to Inside – Gauge Temperament of Bees

If more aggressive than prior inspection, why?

1. Colony stress:

- ☼ Predator
- ☼ Poor weather conditions for inspection
- ☼ Queenless

3. Genetics

2. Beekeeper Error:

- ☼ Moving too fast
- ☼ Taking too long
- ☼ Clumsy with frames. (Make it a goal to not use gloves, if possible.)
- ☼ Using too much or too little smoke
- ☼ Do not wear dark colors or red.
- ☼ Do not eat a banana prior to inspecting hives.



Outside to Inside

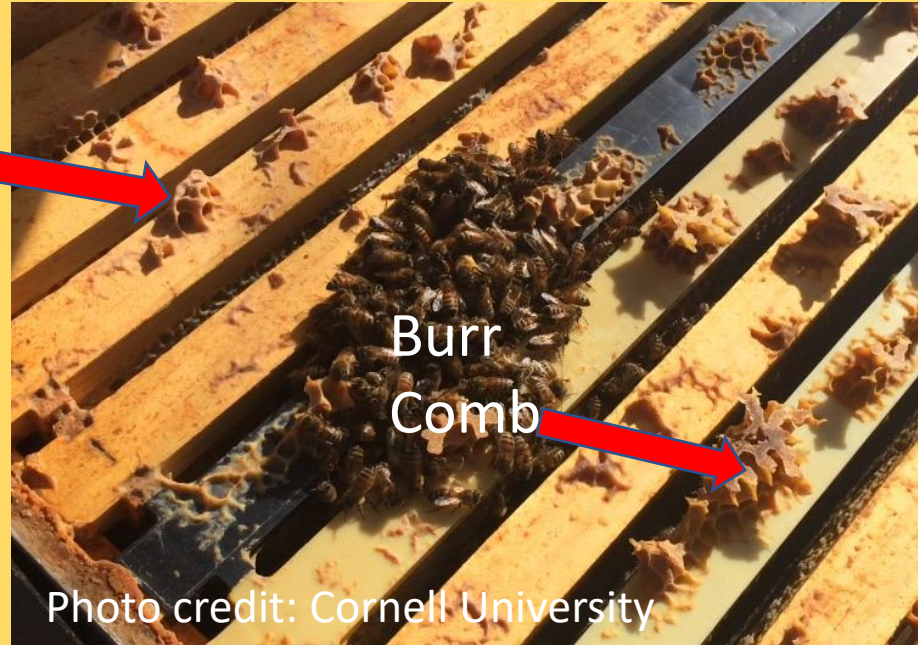
Burr Comb - *Nuisance*

- 🐝 Maintain bee space of $3/8''$

Cross Comb (deep amount of comb between frames) - *Problem*

- 🐝 Level hives
- 🐝 Maintain bee space of $3/8''$

Burr Comb



Cross Comb



First Look Inside

- Evaluating resources
- Brood pattern observation
- Evaluating space needs
- How does this compare to expectations?



Photo Credit: Karen Sabath

First Look Inside

- Evaluating resources
 - ✿ Pollen & Nectar, time of year
 - ✿ Volume/type of brood



Photo Credit: Eleanor Andrews (Cornell University)



Photo Credit: Karen Sabath

First Look Inside

Brood Pattern Observation



“Solid” brood pattern – Up to 10% not filled is ok.



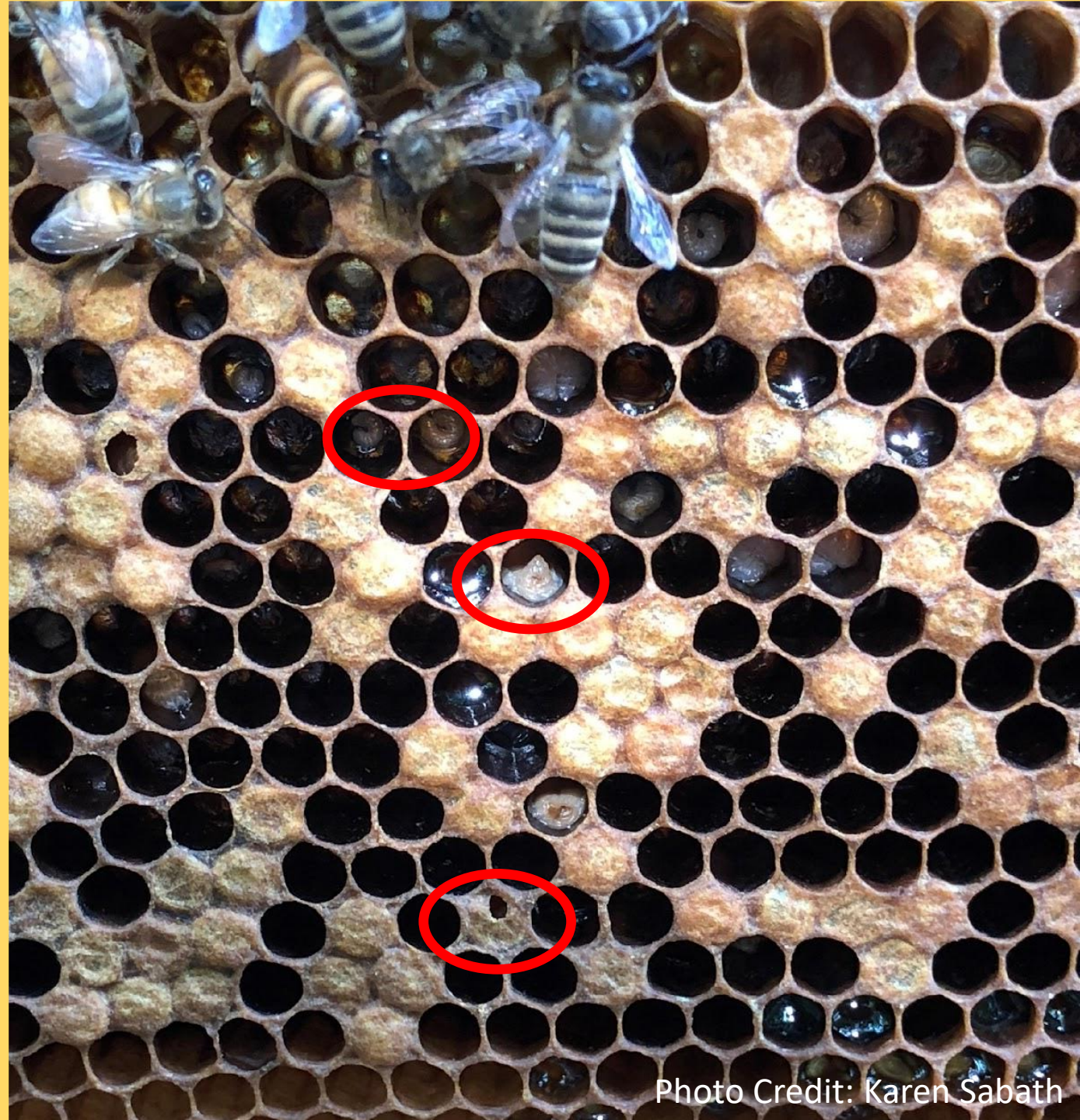
“Spotty” brood pattern

First Look Inside

Brood Problems:

- ☼ Perforated Caps
- ☼ Removed Brood
- ☼ Chewed down Brood
- ☼ Misshapen Brood
- ☼ Dry Brood

Signs of disease,
parasites (mites),
poor nutrition.



First Look Inside

- Evaluate the Space
 - 🐝 Honey bound?
 - 🐝 Pollen bound?
 - 🐝 Brood bound?
- Consider adding supers and frames before it's overcrowded



Deeper Look

- 🐝 Queen-right
- 🐝 Laying Workers
- 🐝 Pests
- 🐝 Disease



Photo credit – Bee Informed Partnership

Deeper Look

Do you have a queen?

- 🐝 Look for single eggs in cells! Much easier than looking for moving Q.

If not, is colony in the process of making a new one?

- 🐝 Do you see capped or uncapped queen cells? (Swarm, supercedure, emergency)
- 🐝 Do you see recently torn open queen cells? (Virgin queen?)



Photo credit: Cornell Master Beekeeper Course, "The Art and Science of Beekeeping", "Swarming", "Swarm Control"

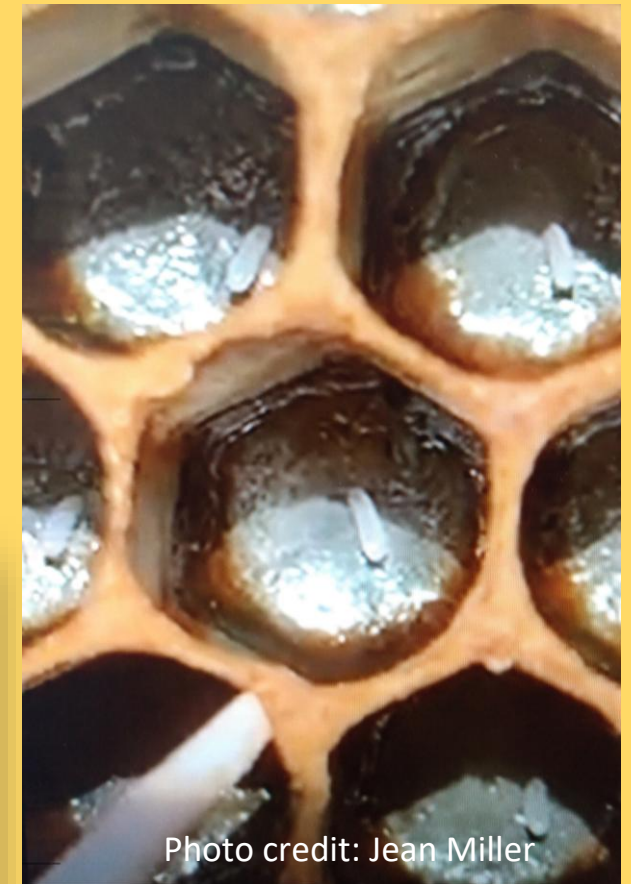


Photo credit: Jean Miller

Jean's Tip – Don't see eggs, queen, or queen cells and not sure if there's a virgin queen? Add a frame of eggs/young larvae from another healthy hive. Just make sure you don't add the queen from the other hive. Don't wait more than 2 weeks to do this.

Timeline of a Colony Being Queenless

Characteristic	Time Observed
Roaring bees	in the following hours/days
Increased defensiveness	in the following days
Emergency queen cells	in the following days to three weeks
Multiple eggs per cell	after three to four weeks
Bullet-shaped drone cells	after about one month
A high number of drones	after about two months
Drones that are smaller than normal	after about two months
Dwindling adult population	after about two months

Laying Workers!
Colony will eventually die.

Laying Workers!
Colony will eventually die.

Deeper Look

Laying Workers

- ☼ Can occur 3 to 4 weeks after a hive becomes queenless.
- ☼ Difficult to rectify.



Photo Credit: Karen Sabath



Only domed shaped drone brood in "worker" cells

Photo Credit: Bee Informed Partnership

Multiple eggs in cells.

CONFUSING QUEEN PROBLEMS

Laying Worker

- No queen for multiple weeks
- Many eggs/cell
- Eggs are not centered
- Worker ovaries are activated

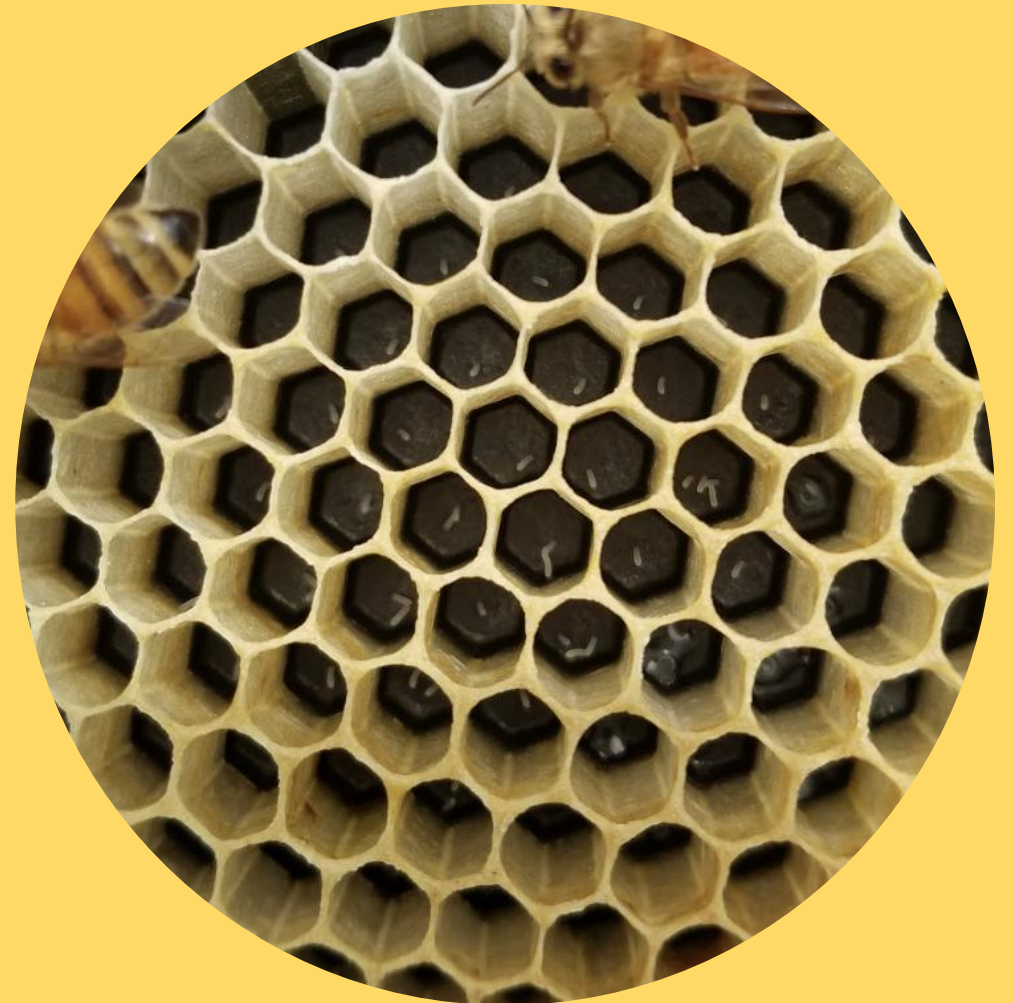
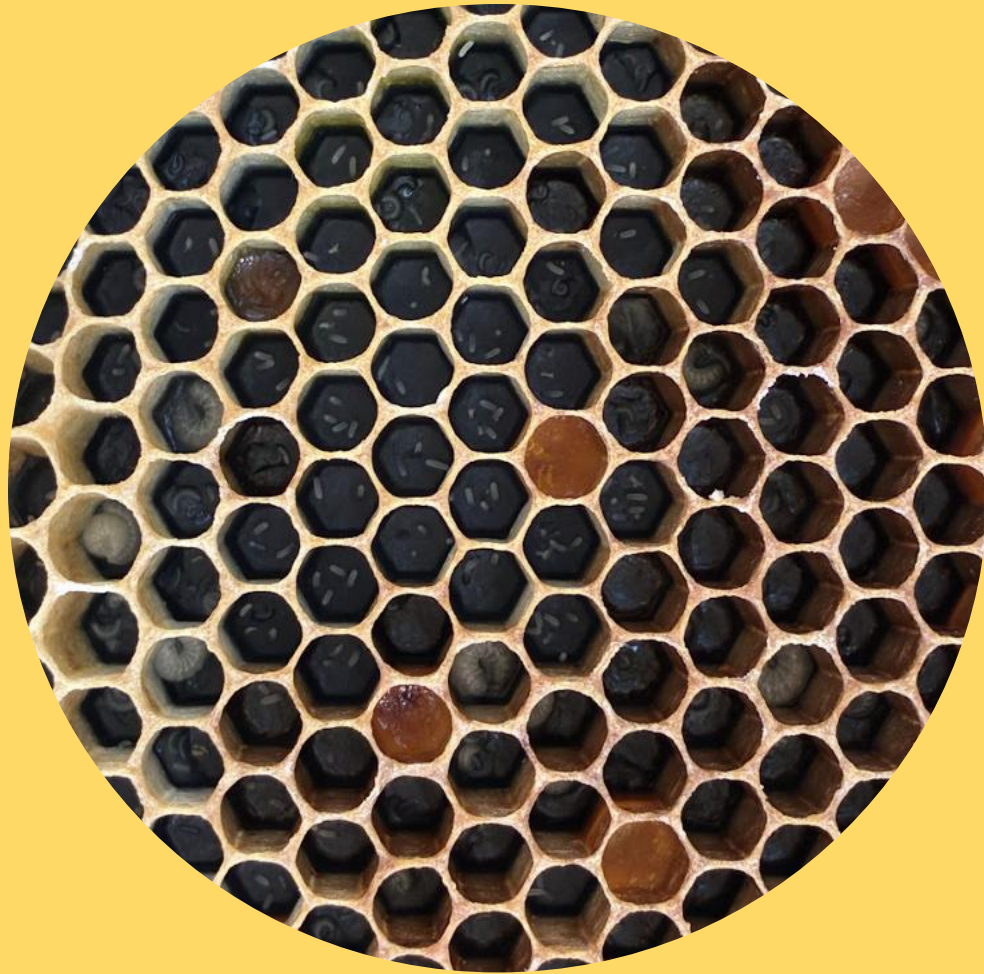


Slide provided by John Gaut

CONFUSING QUEEN PROBLEMS



CONFUSING QUEEN PROBLEMS



CONFUSING QUEEN PROBLEMS



LAYING WORKER



NEW QUEEN

Deeper Look...

At Your Queen's Performance

- The queen is the source of the brood
 - ✿ Brood pattern, **mix of brood**
- Behavior can also be genetic
 - ✿ Overly aggressive hive
 - ✿ Hygienic breeding



Photo Credit: Barbara Lindberg

How to Replace the Queen

- ✿ Reputable source (preferably local)
- ✿ Find and remove the existing queen
- ✿ Introduce the new queen slowly
 - ✿ In a queen cage with candy to allow the workers to spread her new pheromone



Deeper Look

Symptoms of Diseases in Adults:

- ☼ Deformed or K Wings
- ☼ Hairless, Shiny
- ☼ Twitching

Typically signs of (viral) disease. Often transmitted by varroa mites. Beekeeper's nemesis!



Photo Credit: James Ellis (Univ. of Florida)

Photo Credit: Karen Sabath



Photo Credit: Karen Sabath

Small Hive Beetle

Deeper Look – Other Pests



Photo Credit: Karen Sabath



Photo Credit: Karen Sabath

Wax Moths



Bee Informed Partnership

Photo Credit: Mary Kate Wheeler (Cornell University)



Bee Informed Partnership

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Yellow Jackets

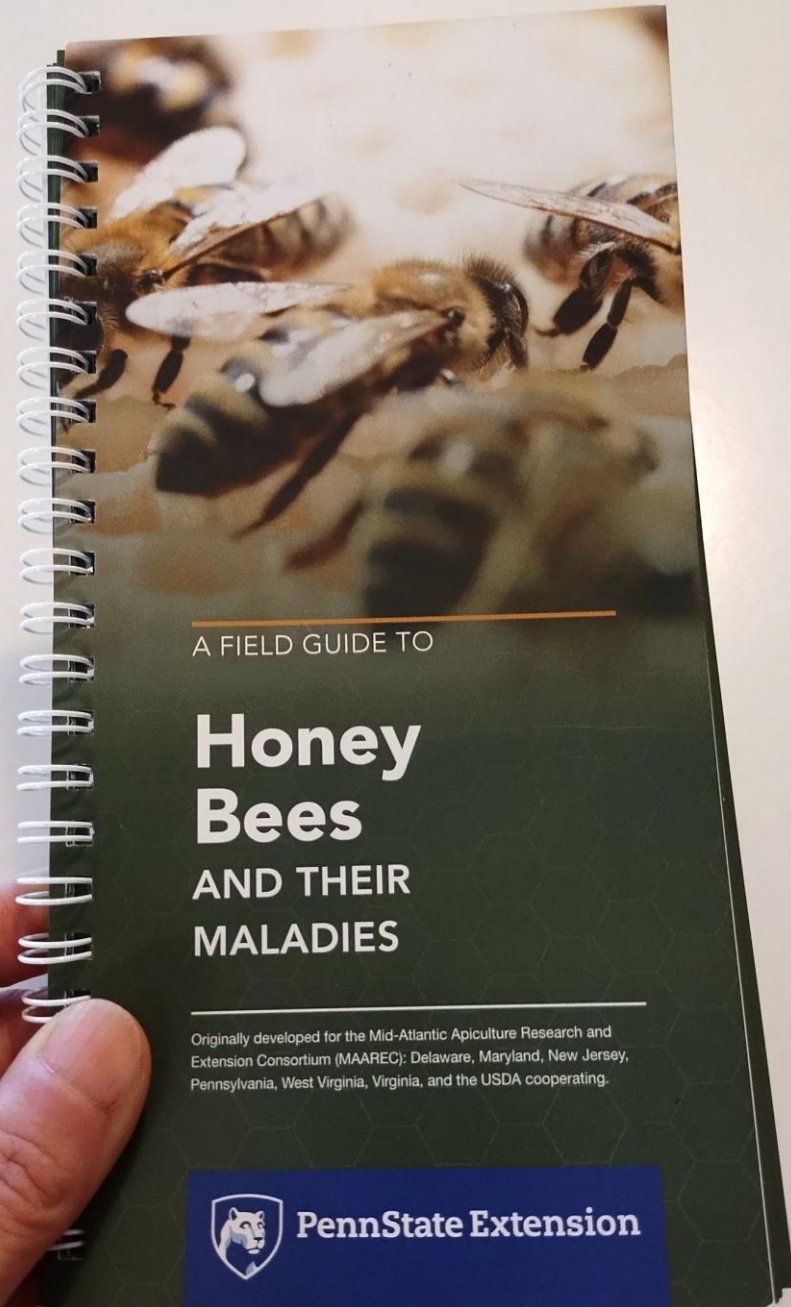
Ants on Inner Cover – Try sprinkling cinnamon!

Strong colonies in *properly sized hives* can withstand these pests.

Deeper Look

Disease

- 🐝 Chalkbrood
- 🐝 Parasitic mite syndrome
- 🐝 European foulbrood
- 🐝 American foulbrood
- 🐝 Varroa mites
- 🐝 Wax moths
- 🐝 Hive beetles....



Deeper Look

The screenshot shows a web browser window displaying the Cornell CALS website. The browser's address bar shows the URL `pollinator.cals.cornell.edu/resources/`. The website header features the Cornell CALS logo and the text "Cornell CALS College of Agriculture and Life Sciences". A search bar is located in the top right corner. The main content area is titled "Pollinator Network @ Cornell" and includes a navigation menu on the left with the following items: About, Research, Dyce Lab Pollinator & Beekeeping Resources (highlighted), General Beekeeping Resources, Parasite and Disease Resources, Business Resources, Beekeeping Workshops, Grower Resources, Planting Pollinator Habitat, Removing Your Swarms, Master Beekeeper Program, NYS Beekeeper Tech Team, Wild Bees of New York, and Donate to the Pollinator. The main content area features a large image of bees on a honeycomb, with a red banner overlay that reads "Dyce Lab Pollinator & Beekeeping Resources". Below this banner, the text reads: "Home / Dyce Lab Pollinator & Beekeeping Resources" and "Welcome to the Dyce Lab for Honey Bee Studies". The text continues: "The Dyce Lab is the center for beekeeping resources in the Northeast. For the past 50 years, the lab has been the go-to place for beekeeping resources, workshops, and honey bee information. The lab's focus is to promote a sustainable beekeeping industry by conducting applied research, providing educational programs, and supporting beekeepers. The lab works closely with hobbyist, part-time, and commercial beekeepers across New York." Below the text is a photograph of a green building, likely the Dyce Lab, with an American flag in front.

Another excellent resource – Pollinator Network @ Cornell



Don't Be Overwhelmed

- ❁ Be prepared with:
 - ❁ Tools
 - ❁ Books and Journals
 - ❁ Treatments/Food
 - ❁ Meetings/Conferences

- ❁ And....join a beekeeping club to seek the knowledge of other successful beekeepers!



Try to get a local mentor

Savor the sweetness of beekeeping!



QUESTIONS?

Photo Credit: Jean Miller

Hive Inspections: When Things Go Wrong

Jean Miller

Cornell Master Beekeeper

Rutgers Master Gardener

February 2022



Photo credit: Getty Images

Winter/Early Spring:

- **Maples** (Silver, then red)
- Winter Aconite
- Hellebores
- Snowdrops
- Crocuses (not deer resistant)

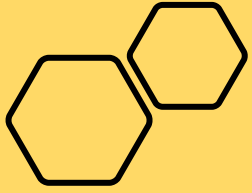


Winter aconite



Silver
maple

Hellebores in full bloom.



Spring/Early Summer:

- Alliums
- Hollies (American, Japanese,...)
- Boxwoods
- Lamium (Red Deadnettle)
- Ajuga (Bugleweed)
- Cherry trees (NOT double blooms)
- Crabapple trees
- Redbud trees



American holly



Boxwood



Lamium

Ajuga



Catmint



Lavender

Photo credit Cornell University 2006

Summer:

- **Mountain Mint**
- Anise hyssop
- Catmint
- Lavender
- White Clover
- Milkweed (Common, swamp, butterfly weed)
- Linden (Basswood) and Tulip Poplar Trees

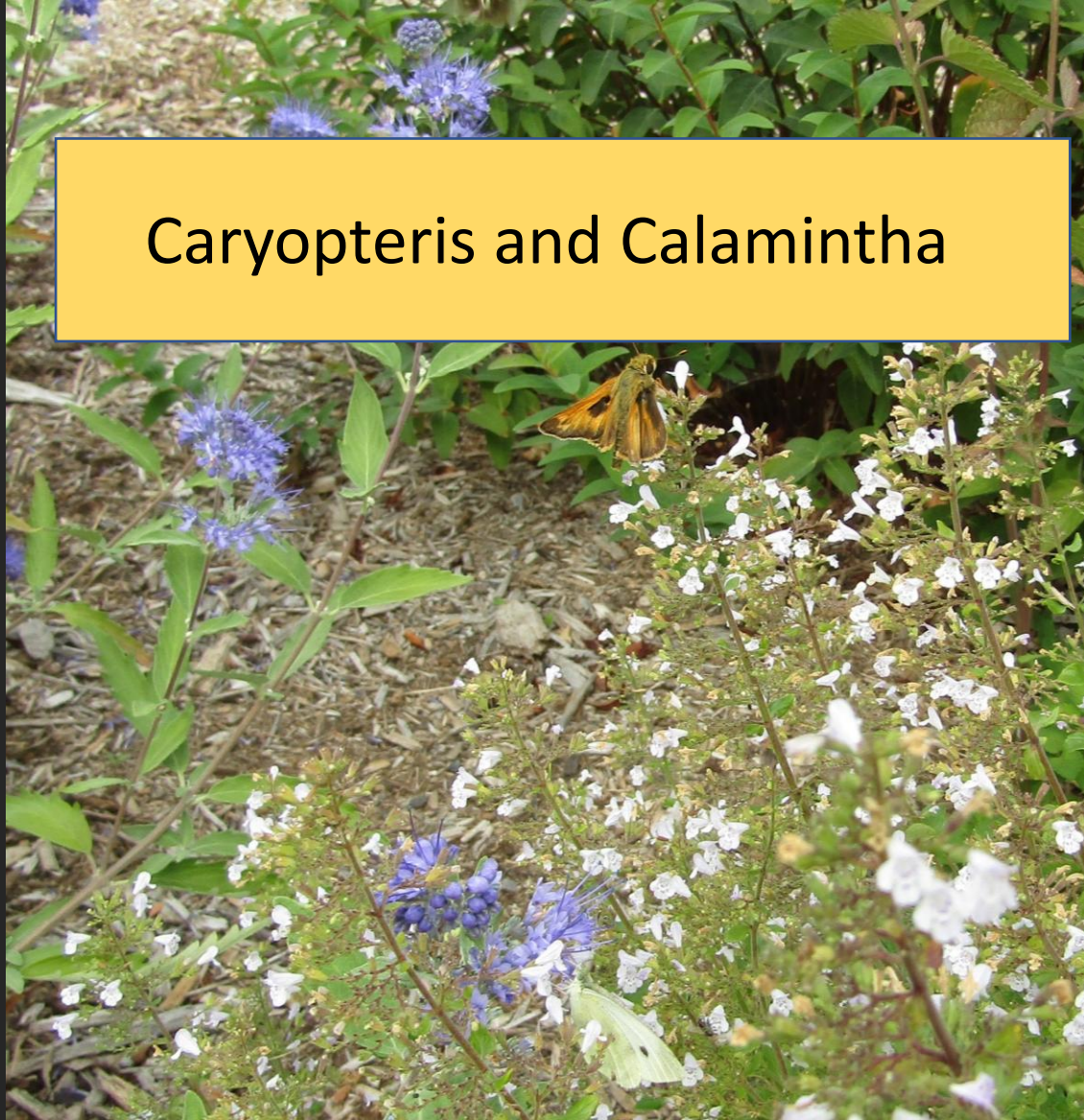


**Clustered
mountain mint
(*Pycnanthemum
muticum*)**

**Anise hyssop
(*Agastache
foeniculum*)**

Late Summer/Early Fall

Caryopteris and Calamintha



White wood aster
and Goldenrod

