

Bee College

Friday and Saturday, October 12-13, 2018
at the University of Florida, Gainesville, FL.

Compiled by: Paul Mikkelsen, October 17, 2018

Throughout the notes, the term “bees” is used as a short version for “honey bees”

How Honey Bees Make Honey (Friday, 8:30 am), by M. Bammer; BammerMA@

Bees do NOT make honey for humans. [Why do they make honey to excess?]

Bees collect water, nectar, tree sap & resins (for propolis), and pollen

Bees have multiple stomachs: 1. for digestion; 2. the “honey crop”, for temporarily storing/carrying nectar, to later regurgitate it.

“**Receiver bees**” in the hive meet the nectar-laden bee to take the nectar. The forager bees don’t deposit the nectar but rather “swap” nectar with the receiver bee by joining their proboscis.

The nectar will be stored and need to be dehydrated to 17-18.5% moisture. This can be tested with a refractometer. To accomplish this, the bees:

- a) blow bubbles into the nectar
- b) worker bees fan their wings over the nectar cells

Once dehydrated, the **nectar** then becomes **honey**!

A single honey bee can produce 1/12 of a teaspoon of honey in its lifetime (about 40-45 days), but note that it does not become a forager for a couple weeks after emerging from its cell.

Once the nectar becomes honey, and doesn’t need to evaporate further, the cells are capped with wax. This capping of the honey cells is accomplished by wax glands. It takes 8 lbs of honey to make 1 lb of wax... this is a good reason to re-use comb!

About 10,000 to 15,000 bees are needed to run the colony; numbers greater than that are directed to be foragers. Only add a honey super when the box that will be below it is about 75% full of honey.

Can use 9 frames, evenly spaced, in a 10-frame honey super to get the bees to draw out comb a bit longer to make larger cells. This (a) holds more honey per frame and (b) extends the caps out further, making it easier to uncap the cells with a hot knife.

Bees are resting about 80% of the time, in the hive! Thus, the saying “**busy as a bee**” is a misnomer.

Walking Tour of the Honey Bee Lab (Friday, 9:40 am), by Jamie Ellis

An awesome presentation, and the only folks to enter and preview the new, but unfinished, beekeeping museum.

Installing Your First Colonies (Friday, 11:00 am), by B. Stanford

All hands-on in the apiary.

Catching and Hiving Swarms (Friday, 2:00 pm), by Bill Kern (has worked bees in Palm Beach Co.)

Swarms are scary to the general public, but actually are the least aggressive of all (even the African Bee swarm!). This is because the bees have no hive to defend.

Swarms will occur when: nectar flow is good, and/or the bees are running out of space in the hive.

Manual hive “splits” are actually “**artificial swarms**”.

The swarm will initially go about 30 feet, but may eventually go about 30 yards. The “**scout bees**” will then search for a new home location and return to the swarm and do the **waggle dance**. Several waggle dances are observed; the more aggressive and energetic, the better the new location, and is the dance accepted by the swarm. The swarm then moves, but NOT lead by the queen.

Sugar syrup spray helps coalesce and calm the bees of the swarm, but can attract ants later. Some swarm-catcher folks simply use plain water, instead of sugar water, to accomplish the same goal.

Never smoke a swarm!!!... they’ll disperse.

Swarm traps use **Nasonov** lure (or **Nasanov**), a combination of about 4-8 compounds (geraniol, nerolic acid, citral + gerianic ____, etc.). Nasanov smells like Lemon Pledge (but don’t use Lemon Pledge to attract swarms!).

Cone Trap: made from recycled wood pulp; developed “out west”; mount sideways on trees in Florida due to water accumulation in the trap if it is mounted vertically. Can attach to a board, and then attach that board to a tree. High placement is simply to keep it out of the reach of people (thiefs!). Normal placement height can be about 6 feet off the ground.

Other types of traps:

Top Bar Trap

Nuc Boxes

Brood Boxes (without frames)

Plywood Box (perhaps 12x12x12, 9x9x19.5) with an entrance hole in it.

Attractants: 2:1 mix of **citral & geranial**. Can buy on Amazon; citral: 100 ml/\$30 LG grade, \$41/oz for FG (Food Grade); **lemongrass** = 65-85% citral; **geranial**: \$33/g LG, \$42/oz FG). Geranial is extracted from geraniums & roses. **Palmarosa oil** (*Cymbopogon martinii*). **Citronella oil**. Rub these oils inside of trap, with lemongrass, Palmarosa grass, & citronella grass.

After a swarm is trapped, move the trap to the bee yard and leave for 2-7 days. Place the new hive where the trap was, and transfer comb from the trap to the hive; then, remove the empty trap.

IF a swarm is very aggressive, or too aggressive to trap... attacking your veil, etc... you don’t want those bees in your bee yard! (“**absconded bees**”?) These could be **Africanized Honey Bees** (AHB), and will spray even venom to your face through your veil! Your nose may start to tingle!

Re-queening: Assume that ANY **feral** (or **wild**) colony trapped is **Africanized...**
you MUST re-queen the hive!

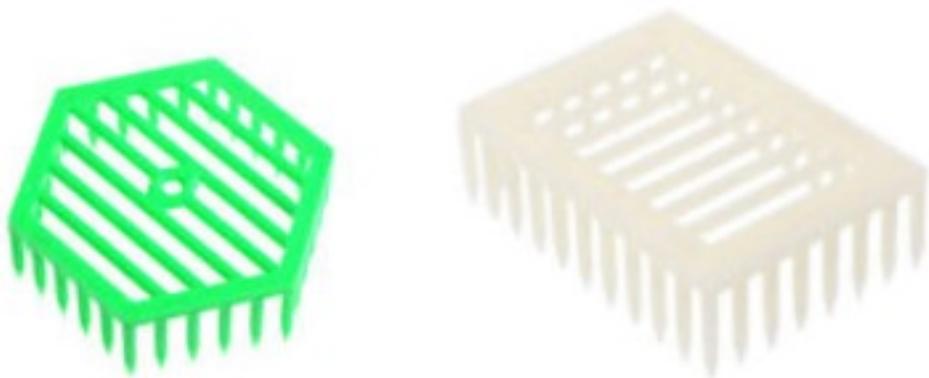
One week after capturing the swarm, find and kill the old queen AND remove all queen cells. One week later, again remove all queen cells. NOW, they can't re-queen themselves.

Feral = an animal from a breed or species that has either previously been domesticated and then allowed to revert back into a natural state, or that has the potential to become domesticated.
Wild = a natural individual or population; one that goes through its entire life without any need for human intervention, either directly or by means of alterations to their environment of situation. They do not rely upon people for food or their other needs, and may in fact go through their whole lifecycle without ever coming into close contact with, or even seeing, a human being.

Next, obtain and secure a new, mated queen under a "**push in cage**". Leave the cage in place until workers emerge AND the queen is laying.

Use a "**push-in cage**" because other types allow other bees to chew off the legs of the new queen. You can make a push-in cage from hardware cloth, about 8"x8" final size, or buy one for less than \$1.

See Ebay, and search: "Queen Marker Plastic Cage Clip Bee Catcher" <\$1 or \$1.69 for set of 5!



Understanding Swarming and How to Control It (Friday, 3:00 pm), by Rob Horsburgh

Rob was the apiary inspector for NE Florida; he monitors the spread of Africanized bees.

To prevent swarming, you can destroy ALL queen cells. However, if you miss even one, the hive will swarm. Give the bees plenty of space to grow/expand in the hive.

Swarms leave with the old queen and 50% to 70% of the hive population.

If a lot of bees are emerging from their cells, after a new queen is created, you *can* get a 2nd swarm... called an “**after swarm**”.

Stimulants to swarming:

Spring – longer days; more flowers/nectar

Older Queen – parent colony will send off the old queen and make a new one

Lack of space for brood – cramping (but, even with excess space, they may swarm)

Swarms generally can occur late January, with most occurring in March or April, somewhat in June, then not in Summer, and can pick up in Fall. Swarms in Fall or Winter have little chance of survival.

Swarms can reduce the mite levels in the parent hive.

If a swarm occurs, scout bees venture away from the swarm and find a good spot for a hive, reporting back to the swarm with a waggle dance to show the location and suitability of the site.

Bees will prefer to seek out a site with 10-gallon capacity of any shape to inhabit, with a small entrance hole of 2-4 sq. in.

In the parent hive/colony where you suspect a swarm may be coming, there may be up to 70 queen cells. If there are only 1-4 queen cells, then they are likely of the “**supercedure**” cell type, in the middle of the frames. Choose to let the bees do the supercedure process, as there is likely a problem with the old queen.

A new, virgin queen will fly her mating flight within 4-7 days after emerging and mate with many drones. Hundreds of drones may try to keep up with her in an attempt to mate, with about 10-15 of them being successful. After a successful mating, the drone will die.

From the loss of an old queen to the mating and laying of a new queen causes a delay in brood production/cycle. In her first days of laying, a newly-mated queen may lay multiple eggs per cell. She can initially lay 200-300 eggs/day but will later lay 2,000 eggs/day.

Swarming substantially diminishes the productivity of the colony.

Always re-queen a hive with known **European queens**... the old, swarmed queen MAY have mated with one or more Africanized drones, making a percentage of her offspring Africanized!

Monitor hives about every 10 days. If bees occupy the tops of 8-10 frames, consider doing a **split** to avoid a swarm.

Decide: when to super or when to split!

Adding a honey super does not create more brood space!

Average loss of bees is about 40-50% over winter... winters "up north", that is.

Swarm prevention: cut off 1/3 of ONE forewing of the queen... she will not be able to fly.

Note that the queen can still leave the hive, but doesn't get far.

If other bees note the clipped wing of the queen, seeing her as damaged, they may decide to re-queen the hive by creating **supercedure cells**.

Recommend moving splits 1 mile away. If not, the split bees may return to the parent hive. If this can't be accomplished, then move the split as far away from the parent hive as possible. If it must remain close to the parent hive, re-orient the entrance to the opposite direction of the parent hive.

If you do a split, always try to move the old queen to the new hive... this emulates a swarm.

Shake some bees from the old hive to the new hive... this gets some "**nurse bees**" into the new hive!

Can reduce/delay swarming by:

"**checkerboarding**"... placing an empty frame between 2 brood frames. This MAY cause problems in northern climates in winter, as the bees may not be able to keep themselves warm.

Adding a brood box

Rotating the combs

Adding a hygienic queen

Can re-queen from (a) eggs, (b) cells, or (c) purchase

Russian queen – mite resistant

Italian queen – offspring makes lots of honey

Hygienic queen – offspring focus on cleaning queen and brood and each other

Walk-a-Way splits disrupt the brood cycle for 4-7 weeks.

This *can* reduce mite levels!

Can artificially break the brood cycle, to reduce mite levels, by caging the queen for a week (or so).

Always feed your bees after a split... they're stressed.

Common Pests of the Honey Bee (Saturday, 8:30 am), by Jamie Ellis

Classroom lectures are the worst method to teach others. You will forget 80% of the material presented. If given resources, they'll always be available!

Beekeeper resources: www.uf.honeybee.com

Honey Bee Health Coalition (varroa resources): <https://honeybeehealthcoalition.org>

Google: "bee health eXtension" ... https://articles.eXtension.org/bee_health

MAAREC - Mid-Atlantic Apiculture Research and Extension Consortium

Email Jamie Ellis and request a list of resources:

JDEllis@ufl.edu

To know when there is a problem with your bees, you must know what a **healthy bee** looks like!

Note **hair loss**... perhaps due to fights; perhaps due to viruses.

Brood:

Eggs: should be 1 egg/cell, on the "back" of the cell (not the "bottom")

Larvae: in the back of the cell, in a C-shape

Younger larvae in pool of "brood food" = "**Milk Brood**" (it's white, and glistens)

Capped = "pre-pupae" (not "larvae" at this stage); upright in cell;

This stage used to differentiate between **American and European Foulbrood**

Normally, bees will fly off any **dead bees**; IF they are piled up outside the hive: problem!

Note what happens, normally, seasonally. If this varies, there MAY be a problem.

Queens will normally lay in a tight, solid, circular pattern, and thus have young in adjacent cells at the same stage. IF there are lots of empty cells, or adjacent brood is of different ages: problem! MAYBE

Empty cells in a brood pattern may occur due to worker bees cleaning out dead eggs, larvae, or varroa-infected larvae.

PESTS (...not diseases)

WAX MOTHS

Greater Wax Moth – larger in size

Lesser Wax Moth – smaller in size

Moths will lay eggs, which hatch into caterpillars (= "wax moth larvae"), the larvae eat the beeswax and grow, then they excavate holes and grooves into the wood of the hive and pupate.

(Unknown why they have to excavate holes, as they *could* pupate on the surface of the wood)

When using sticky bottom boards, note the dark fecal matter ("frasse") of the caterpillars.

The Greater Wax Moths will tunnel at the midrib of a comb (i.e., at the foundation). The bees get caught in the webbing created by the moths and can't escape their cells... = "**Galleriasis**"

Lesser Wax Moths go through the comb just under the cell cappings. IF you see pupae that should be capped, but are uncapped by the moths, they are called "**bald brood**".

Wax moths are commonly used in entomology studies because they grow very well feeding on dog food. Wax moths are commonly used as bait for fishing.

Control other "stuff" in the hive and you likely won't get wax moths; i.e., keep the colony strong!

Generally, wax moths prefer dark combs (i.e., dark colored wax). Thus, there is less damage from wax moths when using new frames with new comb... at time of the bee's first egg set.

Wax moths don't like light and air.

To rid old frames and boxes of wax moths, you can use moth CRYSTALS.... NOT MOTH BALLS! Use the crystals in the stacked boxes (containing frames) that are not in use. This fumigates the stack before re-use. After fumigation, allow the boxes and frames to "air out" in full sunlight.

VARROA

"If you are not controlling varroa, your bees will die." Jamie Ellis

"Varroa is the **#1 killer** of honey bees on the planet." Jamie Ellis

Varroa reproduces in the brood cells, and will transfer from bee to bee.

NEW FINDING: Varroa feed on **fat bodies** in the bee (not on bee blood!)

Varroa also transport pathogens & virus (e.g., **deformed wings**)

Visit the Honey Bee Health Coalition: <https://honeybeehealthcoalition.org>

and get the varroa management documents: <https://honeybeehealthcoalition.org/varroa/>

In the hive, you **MUST** sample for varroa... destructively or non-destructively, but **MUST** sample!

On pesticides for varroa management:

"There's nothing that you can put into your hives that is worse than varroa itself." Jamie Ellis

TRACHAEL MITES

Good news: Trachael mites have never been found in Florida!

There are lots of them in Georgia, and thus are probably in Florida, but they're not a big problem.

Trachael mites enter the bee through the bee's spiracles. The trachea is "all muscle" (very muscular). Trachael mites manifest in winter (due to bee crowding in the hive)... **BUT:** as there is no real winter in Florida, this is at best a minor problem.

Trachael mites will cause:

- K-wing

- Disorganized cluster of bees

- Colony death in the Spring

What kills varroa will also kill tracheal mites.

OTHER MITES... but not in the USA

Tropilaelaps clareae, a pest on *Apis dorsata*

See: <http://entnemdept.ufl.edu/creatures/MISC/BEES/Tropilaelaps.htm>

When this co-occurs with varroa, *T. clareae* outcompetes varroa.

Can't overwinter in broodless colonies.

SMALL HIVE BEETLES

The larvae of small hive beetles (SHB) eat pollen and bee larvae.

Great resource: <https://suburbanrancher.wordpress.com/tag/hive-beetles/>

Control:

Can make hive traps out of political signs (or similar), by cutting them and exposing the interior of the corrugations. Bait/poison is placed inside these holes, and the beetles enter, feed, and die. This process keeps the poison away from the bees, as it would also kill them!

Swiffer pads can be used if unscented and without chemicals.

Traps, containing vegetable oil or mineral oil, placed above the frames

Traps are also made of individual CD cases, placing bait/poison inside (where bees can't go), and placing the cases in the bottom of the hive.

The BEST CONTROL of hive beetles is: maintain a strong, healthy hive!

[Jamie Ellis says that he has never lost a hive to small hive beetles!]

MISC. NOTE... lights at night

Bees will fly at night, and fly to lights where they will hang out till they die!

Avoid lights at night around and in the vicinity of the hives.

Common Diseases of the Honey Bee (Saturday, 9:40 am), by Jamie Ellis [**Pathogens**]

Melitta is a genus of bees in the family Melittidae. It includes about 40 species restricted to [Africa](#) and the northern temperate zone.

For info, see the “**Mellito Files**” on the website:

<https://entnemdept.ifas.ufl.edu/honey-bee/extension/melitto-files-blog/>

With a genus of the honey bee being *Melitta*, a “**melittophile**” is something that lives with bees.

“Melitto Files” is a play on “melittophile” ...pun intended!

Good resources:

eXtension (“e” for electronic, then “Xtension” for extension, thus: eXtension)

https://articles.eXtension.org/bee_health

Bee Informed Partnership

<https://beeinformed.org>

MAAREC - Mid-Atlantic Apiculture Research and Extension Consortium

<http://agdev.anr.udel.edu/maarec/>

Email Jamie Ellis and request a list of resources:

JDEllis@ufl.edu

Never start beekeeping with just one colony.

You can’t tell if your bees are healthy (or not) if the only colony you have has problems.

It is good to have (at least) a second, normal and healthy colony to compare to.

Pathogens will cause bees (mostly workers) to lose their hair.

Most pathogens affect brood... know what good brood looks like!

There are no diseases or pest of honey bee eggs!

Eggs will be C-shaped, shiny, white... often called “**milk brood**”

Larvae are capped as the “**pre-pupal**” stage. In 1-1.5 days, it sheds its skin and becomes a “**pupa**”.

Normal cell caps are NOT perforated, and NOT sunken.

Normally, there are no piles of dead bees immediately outside the hive.

Watch for a normal/good brood pattern.

Note the capped brood pattern... brood cells are capped within 10 days of the egg stage.

SACBROOD VIRUS

Occurs in the bee larvae.

Kills the larvae when in the pre-capped stage... i.e., when the larvae are upright in the cell, heads up.

Normally, pre-pupal stage individuals should be capped.

Look for: uncapped pre-pupae; holes in the caps (if present); dark-colored pre-pupae
Such signs could indicate either **sacbrood** OR **American Foulbrood**

When larvae die, and are removed from the cells:

IF it is sacbrood: **scale** is left in the cell... American Foulbrood does not leave scale!
Also, upper 1/3 of larva is dark, and there is no slimy "**ropiness**" for sacbrood

Bees should note the infected and dead bees in the cells, and remove them.

DEFORMED WING VIRUS

This is the nastiest virus of bees!

The virus is transferred to bees by **varroa mites**.

Some people argue that varroa mites are NOT bad for the bees, by itself, but together with the virus the combination is very bad.

This virus is a #1 killer of bees, worldwide. Thus: MUST kill varroa mites!

The queen and worker bees have the same genotype but different phenotype.

OTHER VIRUSES

A virus complex:

APVB – Acute

KBV –

IAPV – Israeli Acute Paralysis Virus

Others:

Iridescent Virus

Cloudy Wing Virus

Black Queen Cell Virus – death of queen pre-pupae & larvae; a nosema affiliate

Filamentous Virus (a Nosema affiliate)

Bee Virus X

Bee Virus Y

These viruses are usually present, but in low levels.

“Paralysis” = motionless, but shaking; typically lose their hair

Treatment: control varroa; re-queen

FUNGI... Chalkbrood: *Ascophæra apis*
 Kills developing bees in the pre-pupal stage
 Infects the pre-pupal larva's gut and competes for food

Chalkbrood likes an environment that is low, damp, and cool.
 Avoid this situation with your hives
 Provide adequate hive ventilation... keep the hives high and dry

Bees clean out the dead larvae and often drop dead bees... "**mummies**" ... outside the hive.

Chalkbrood is 100% curable!
 IF you have it, the population is susceptible... re-queen!

See: Minnesota Hygienic Bees
<https://www.motherearthnews.com/homesteading-and-livestock/minnesota-hygienic-bees-naturally-healthier-than-other-bees>

FUNGI... *Nosema apis*; *Nosema ceranae*
Nosema ceranae has almost replaced *Nosema apis*

A bee has 3 guts: foregut, midgut, hindgut
 The foregut and hindgut are shed with each molt of the bee
 The midgut remains after the molt and that is where Nosemea is!

Signs: swollen midgut; end of winter massive pooping outside the hive

Rarely find bee colonies lacking Nosema

Fumagillin WAS used to control Nosema, but is now off the market
 Can get "Fumagillin-B" from Mann Lake, Dadant, Amazon or eBay

BACTERIAL DISEASES

European Foulbrood (EFB)... = "snotbrood"; "crud"

American Foulbrood (AFB)... is the worst of the two types

Both types of foulbrood kill the bee brood; Dead brood smell FOUL / BAD!...

hence, the name: foulbrood

Foulbrood must infect the larvae that is less than 48 hours old

EFB kills larvae

AFB kills larvae, pre-pupae, and pupae

EFB is non-spore-forming

Larvae will be deformed: twisted, dark/black-colored;

Larvae appear as a "melted" individual

Parasitic Mite Syndrome (PMS) looks a lot like EFB

AFB does produce spores

Larvae dies and dries and turns to scale in open cells, on the bottom of cells (not the back)

Look in cells, at a 15 degree angle, to see the scale

Brood caps will be perforated and sunken

Do the "rope & snot test" ... if it's not snotty, it's not AFB

Note the pupal tongue, which sticks to the side of the cell as the pupa dies

See: A video field guide to beekeeping

USA is the only country that uses antibiotics.

Treat 2X/year, to pro-actively treat for foulbrood

BUT, if you do, you'll not notice its presence (as spores) because no larvae will be affected.

Can get antibiotic via a veterinarian prescription OR email Jamie Ellis for more info:

JDellis@ufl.edu

Varroa Biology (Saturday, 10:40 am), by Jamie Ellis

Varroa spread to the USA in the mid 1980s

One of the largest ectoparasite-to-host size ratios

A bee having an attached varroa mite is like a human having a volleyball size tick!

Killing varroa is difficult, as both the varroa and the bee are Arthropods... same class of animals.

“Arthropodocides” will kill both varroa and bees!

Varroa feed on fat bodies of immature and adult bees....

This is NEW NEWS! A “take home” message from bee college!

NOT on the haemolymph, as was commonly thought!

See publications by: Allen C. Cohen

Our bee species is not the primary host of varroa ...i.e., another bee species was the primary host

The varroa mite was known by another name until it was discovered as a new species:

Varroa destructor

Varroa destructor Anderson & Trueman 2000 was confused with *Varroa jacobsoni* Oudemans 1904

<https://link.springer.com/article/10.1023/A:1006456720416>

http://entnemdept.ufl.edu/creatures/misc/bees/varroa_mite.htm

Varroa is a natural pest of 9 species of bees

Three types of bees:

Giant – *A. dorsata*; *A. laborosa*

Small – *adreniformis*

Cavity Bee – *A. mellifera*

A. cerata (the natural host of varroa)

Bees are native to Europe, Asia, Africa... NOT the USA

A. mellifera got moved to Asia because of its qualities... it then got varroa

It then moved to Europe... both bees and varroa

Short history of chemical control:

Apistan – 2 strips used, then people overused 4, 8, and more strips... resistance increased

Apiphes – in “Check Mite”

Miticure

Apivar – presently the best chemical control

In the USA, we only have **FERAL** populations of honey bees.

We do not have **WILD** populations (there’s a difference!)

To be “wild”, the populations need to be native to the area... our honey bees are not native.

9 species of honey bee, worldwide

For all bees (not just honey bees):

4,000 species of bees in the world

_____ species of bees in the USA

300+ species of bees in Florida ...including ONE species of honey bee

For *Apis ceranae* bees:

Only the drones are affected by varroa
Bees will bit the varroa and kill them!

Spread of varroa occurs by:

Robbing
Drifting – bees go from one colony to another, especially the drones
Introducing bees to colonies – via splits, hive strengthening
Migratory beekeepers
Reproduction of the colony (i.e., swarming)

Google: varroa life cycle

<https://articles.extension.org/pages/65450/varroa-mite-reproductive-biology>

<https://www.beeeculture.com/a-closer-look-varroa-mite-reproduction/>

<http://beeaware.org.au/archive-pest/varroa-mites/#ad-image-0>

<http://scientificbeekeeping.com/fighting-varroa-the-silver-bullet-or-brass-knuckles-2/>

Varroa go into a cell, propagate, and ONLY the female varroa exit the cell with the emergent bee.
The male varroa never harden (scleratinize) their shells

The longer a female varroa can stay in a capped cell, the more offspring can be produced.
This is why the varroa “prefer” the drone cells... they take longer to mature

It takes 12 days for a varroa egg to mature to an adult varroa
2 new varroa emerge from a worker bee cell
3-4 new varroa emerge from longer term drone cells

Varroa destructor preferentially go to drone cells, likely by chemoreception
If 5-7 mites invade a cell, the bee dies... clearly, this is not good for the mites either!

One method of control is by brood breaks... natural or induced
Natural: swarming... the parent hive is left queenless
Induced: one could cage the queen for a week or two (note days to maturation for varroa)

Best control guide for varroa: Honey Bee Coalition’s “**Tools for Varroa Management**”
<https://HoneyBeeHealthCoalition.org/varroa/>

All About Queens (Saturday, 2:00 pm), by D. Westervelt; tel: 352-267-2568

Don't ever touch the abdomen of the queen! You could easily damage her!

Ideally, the queen should lay 1500-2000 eggs daily (175K to 200K annually)
 After mating, the queen stores 5-6 million sperm, from a dozen or more drones
 Thus, the queen's offspring genetic makeup can differ from bee to bee

In Florida, we get about 11½ months of good laying
 In Canada, they get about 2 years of good laying (but have 6 months of dormancy in winters)

1500 eggs/day yield 60,000 bees in a very healthy hive.
 Worker bees live for ___ days

Brood pattern: note the presence, shape, and density of capped brood on a given comb
 In a 10-frame hive, there are 20 sides of frames the queen can fill, then she starts over as the eggs laid
 in the first combs have emerged.

Should rotate out your (wood) frames every 3 years.
 In winter, place new frames on the outside of the frame set...
 ...bees need center untouched to help stay warm
 In areas with good nectar flow, place new frames in the middle of the hive box...
 ...between two frames of good brood

The new, virgin queen flies her mating flight 10-14 days after emergence from her cell.
 The queen mates with an average of about 17 drones
 This lasts for the rest of her life, and there are no more mating flights
 Sperm is collected in the spermatheca
 The queen can control fertilization of the egg

One queen mated with multiple drones yields
 One "matriline" in the hive and multiple "patrilines" in the hive

Desired colony traits (from a "good" queen)
 Honey production
 Hygienic
 Swarming tendency (Africanized bees swarm more often)
 Gentleness
 Pollen Hoarding / preference
 Propolis gathering

Queen "substance" (90DA)
 Stops worker bees from mating
 Attracts drones, but NOT from her own hive

If the queen begins to fail, is damaged or is diseased, the colony will create a **supercedure cell** in preparation of creating a new, replacement queen.

Beekeepers should typically re-queen 1x/year with a marked, clipped queen to maintain a healthy colony. Commercial beekeepers will typically re-queen annually, in the Fall, so that by Spring the colony is well established and ready to hit the spring nectar flow.

It is legally REQUIRED to have gentle bees – European stock

When buying a queen:

To order a queen, do so 3-6 months in advance!

Choose the type of queen that you want

Mated queen

Virgin queen may not be accepted by the hive

Virgin queen will need to fly & mate, and may die or not return to the hive

Want a clipped, marked queen... color coded

Remember the acronym **WYRGB**: **When You Raise Good Bees**

W=White, for years ending in 1 or 6

Y=, Yellow for years ending in 2 or 7

R=, Red for years ending in 3 or 8

G=, Green for years ending in 4 or 9

B=, Blue for years ending in 5 or 0

Tips:

Use the same colors to mark your frames, to later know their approximate age

Can purchase white, stick-on, numbered dots to apply to frames

Can use “cage marking” to hold and compress the queen for marking

Twist the cage cap a bit to get one wing to extend out of the cage holes... easy clipping!

To catch the queen:

Wings or legs or thorax can be grabbed... NEVER the abdomen!

Be very gentle

Use a queen clip-type cage

Paint the THORAX of the queen... nothing else!

Clip the main/forewing, and only 1 wing

Take off ¼ to 1/3 of the wing... maybe ½ wing

With more of the wing removed, her attendant bees may see her as damaged and replace her

With a clipped wing, the queen can't fly, but she can escape the hive!

Sometimes, she can be found on the ground, not far from the hive; the swarm follows her and also ends up on the ground... this is called a “**blanket swarm**”

Queens are shipped singly or with attendants

“Battery Box” – comes with 1 queen & attendants; the attendants must be removed prior to inserting the new queen into a new hive (attendants have the smell of the old hive)

IF the queen escapes, don't panic, but wait (patiently!) for her to return to where she left from.

For cage “candy” (food for the queen while caged), add a drop of glycerine to the mix to keep the candy from drying out and becoming hard like concrete.

Can order queen cells... capped and unemerged; \$6-\$10; note (obviously): NON-mated!
Queen cells are shipped 9 days old, in a cage box in case she emerges from the cell

Brood delays while re-queening:

30-day brood delay with making your own new queen

10 to 14-day brood delay with receiving a non-mated queen

5-day brood delay with receiving a new, mated queen

Queen cells are “candled” (like for chicken eggs) to see if there is a healthy queen bee inside.
Watch for “Black Queen Cell Virus” larvae... such a queen larvae should not have been shipped!

Teaching Bees to a Non-Beekeeper Audience (Saturday, 3:10 pm), by Caitlin Gill

Caitlin Gill:

RPCV, Paraguay 2010-2012

Graduate student at UF Dept. of Entomology & Nematology

Was in the Peace Corps

Former apiary inspector

Married to Jose Gill... also an apiary inspector

Forewarn about cell phones, unruly kids, etc.

Introduce yourself.

Assess the audience... what level of knowledge does the audience have? Adults? Children? etc.

Recognize how the content of your presentation affects your delivery

Find ways to focus on key aspects

How to design & deliver a presentation... the 1 2 3s

1. Tell them what you are going to tell them (an informative introduction)
2. Tell them what you have to say (the bulk of the presentation)
3. Tell them what you told them (a re-cap/summary closing)

Talk about bees! ...about what? ...what type of presentation?

Powerpoint?... not necessarily good for an older crowd

What's the setting? ...podium? ...outside? ...microphone available? ...large/small space?

Can you alter your plans at the last minute?

Always bring a printout of your powerpoint presentation (prep for equipment failure)

Who are you speaking to? ...adults? ...children? ...students? ...attention span?

What size audience? <20? >50? >100? etc.

How much time do you have? What/how much can you deliver in "X" amount of time?

Leave time for questions!

Define the "take-a-way" message of the presentation... what's the main idea of the talk?

...what are the secondary and tertiary messages?

Make a definitive list of these... and deliver!

For Powerpoint presentations:

Don't read the slides! The slides should have points to elaborate on.

Include photos, for examples of what you are presenting

Areas of focus for a presentation on bees:

Biology, anatomy, behavior, sting care, management, laws

Honey bee needs, products, equipment, pests, diseases

Castes, development time, the queen, swarms

Consider bringing pinned specimens; maybe some "infographics"

Discuss what bees are ...their classification.

Maybe make the point: All insects are bugs; not all bugs are insects

UF has photos available for use... but: give credit where credit is due!

Keep it simple! Present the info cleanly and non-confusing

Bee behavior: stick to the facts (avoid opinions); swarming; importance of the smoker; behavior to be cautious of when working a colony

Products: honey (carbohydrates), wax, pollen (protein), propolis, royal jelly

Equipment:

Types of hives, veils, jackets, suits

Necessary (vs desirable, peripheral, non-necessary) items, cost, durability, where to purchase

Equipment can scare people... caution!

Pests and Diseases:

Talk about main issues (details are likely too confusing... for most audiences)

Show photos of the problem pests

Apiary inspection process was developed to address American Foul Brood

Hive Management Tips:

Basic; what questions would you ask as a new beekeeper?

e.g., how often to you check hives? What do you look for when you open a hive?

Discuss mite checks and Integrated Pest Management (IPM)

Present literature and info sources (books, websites, etc.)

Rules and Regulations:

All beekeepers have to be registered! The state needs data to better manage beekeeping.

List the important statutes, and where to find them.

Good and Bad:

Sting overdose: 5-10 stings per pound of person

Discuss **anaphylactic shock**

Tips and Advice:

Make sure all is visible from the back of the room (or theatre!)

For Powerpoint: nothing less than 20 point font

No Powerpoint? (equipment fails!)... no problem????

If teaching children, and using an observation hive:

Keep it covered until ready to discuss it (keeps the children focused on you!)

Misc:

Recommended viewing: "Magic School Bus" on Netflix

Brushy Mountain

Mann Lake has frame pix & other

Mann Lake has a demo hive with various teaching photos embedded in frames... NICE!

These can be labeled and (safely!) passed around



Teaching Frame Inserts - Set of 20
Product Code: BM-270

\$49.95



Teaching Frames - Set of 10
Product Code: BM-275

\$75.95

Photos and slides should be supporting your content, not BE the content.
 Must be understandable, visually appropriate, not loaded with data
 Don't overload the audience with visuals

Be mindful of your body language, gestures, eye contact, proper attire for the venue/location

Play to your strengths: topics, stories; make things relatable

Nervous? Arrive early; meet the audience early; take deep breaths; have water available;
 remember: YOU have the knowledge; practice!

Humor? Insert a bit of humor; bee cartoons; personal anecdotes... relate to subject matter

Children in audience? Be careful if discussing mating!

Always use reliable sources for information that you present... don't spread bad info!
 i.e., not YouTube, FaceBook, etc.

Have handouts available, if appropriate, an outline; summarize content and take-home messages
 Maybe include your title and contact info. Hmmm...

Save time for questions... and prepare for the common questions!

Status of killer bees?

Illegal to kill honey bees (?)

Colony collapse disorder?

Are bees really dying out?

How does one become a beekeeper? Laws? Clubs?

Sting vs Bite

IF mostly kids and time is limited (e.g., "Ag day" with multiple classes... 540 kids, 20 min each set)
 Is there one, minimal-sized table? Will you be outside?

For props, visit: BioQuip. You can find "life cycle" items for show-n-tell.

<https://www.BioQuip.com>

<https://www.BioQuip.com/search/default.asp>

HAVE FUN!!!