

Beekeeping Frequently Asked Questions

**Metro Beekeepers
Association**



METROBEEKEEPERS.NET

Metro Beekeepers Association is a non-profit 501c3 in the Fort Worth area
Meetings are free & open to the public. metrobeekeepers.net
Corrections & suggestions are welcome. [Contact us](#)

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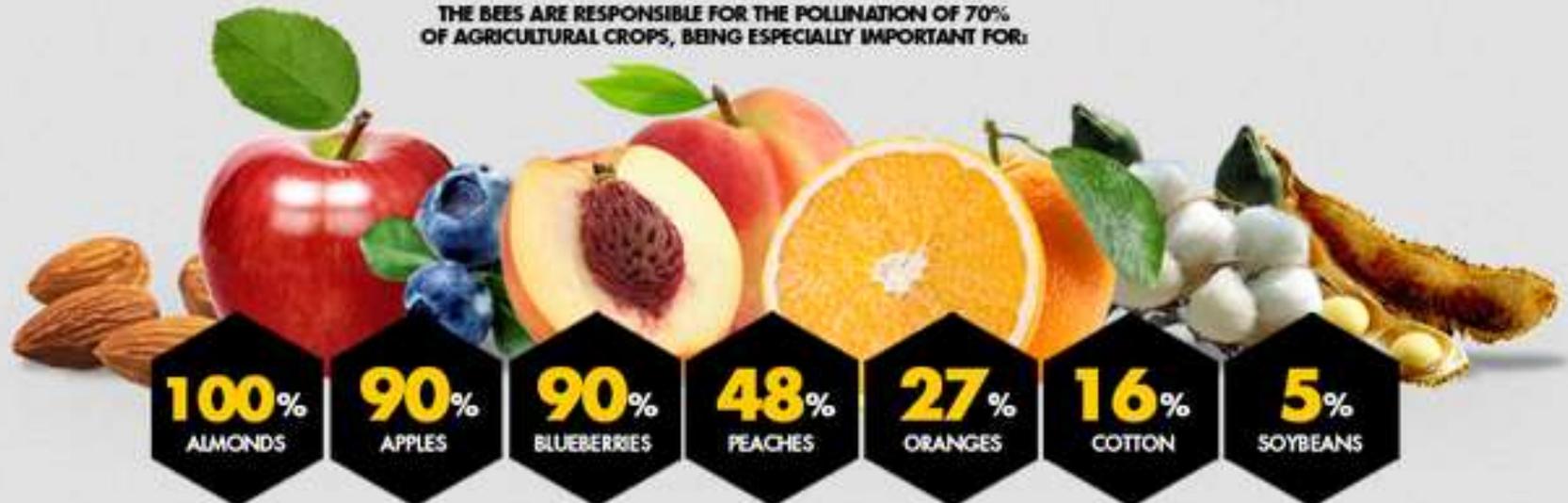
7. Learning

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Why Would Anyone Keep Bees?

1. Honey, Wax, Pollen, Propolis
2. Better gardens, plants, agriculture yield
3. Ag exemption (tax savings, rural property)
4. Fascination. Beekeepers love bees.
5. Help environment by helping bees thrive
6. Local honey can reduce allergy symptoms
7. Medical (burns, arthritis, apitherapy)
8. Make sweet friends at MBA meetings

THE BEES ARE RESPONSIBLE FOR THE POLLINATION OF 70%
OF AGRICULTURAL CROPS, BEING ESPECIALLY IMPORTANT FOR:



Source: United States Department of Agriculture - Roger A. Morse and Nicholas W. Calderone, Cornell University.



Am I Beekeeper Material?

- X I am allergic to bee stings**
- X I would give up if I'm stung a lot**
- I have a place to keep bees**
- I have a few hours / month to work bees**
- I have a few hours per month to learn**
- I can afford the costs for learning, setup, & maintenance, replacements**
- I can lift 50+ lbs on a hot summer day, &/or I have a helpful friend**
- I can learn guidelines, then find out that beekeepers disagree, & I still want to do it**
- I am persistent, despite frustration & loss**
- X I run away screaming when I see bees**

Calvin and Hobbes

BY WATSON



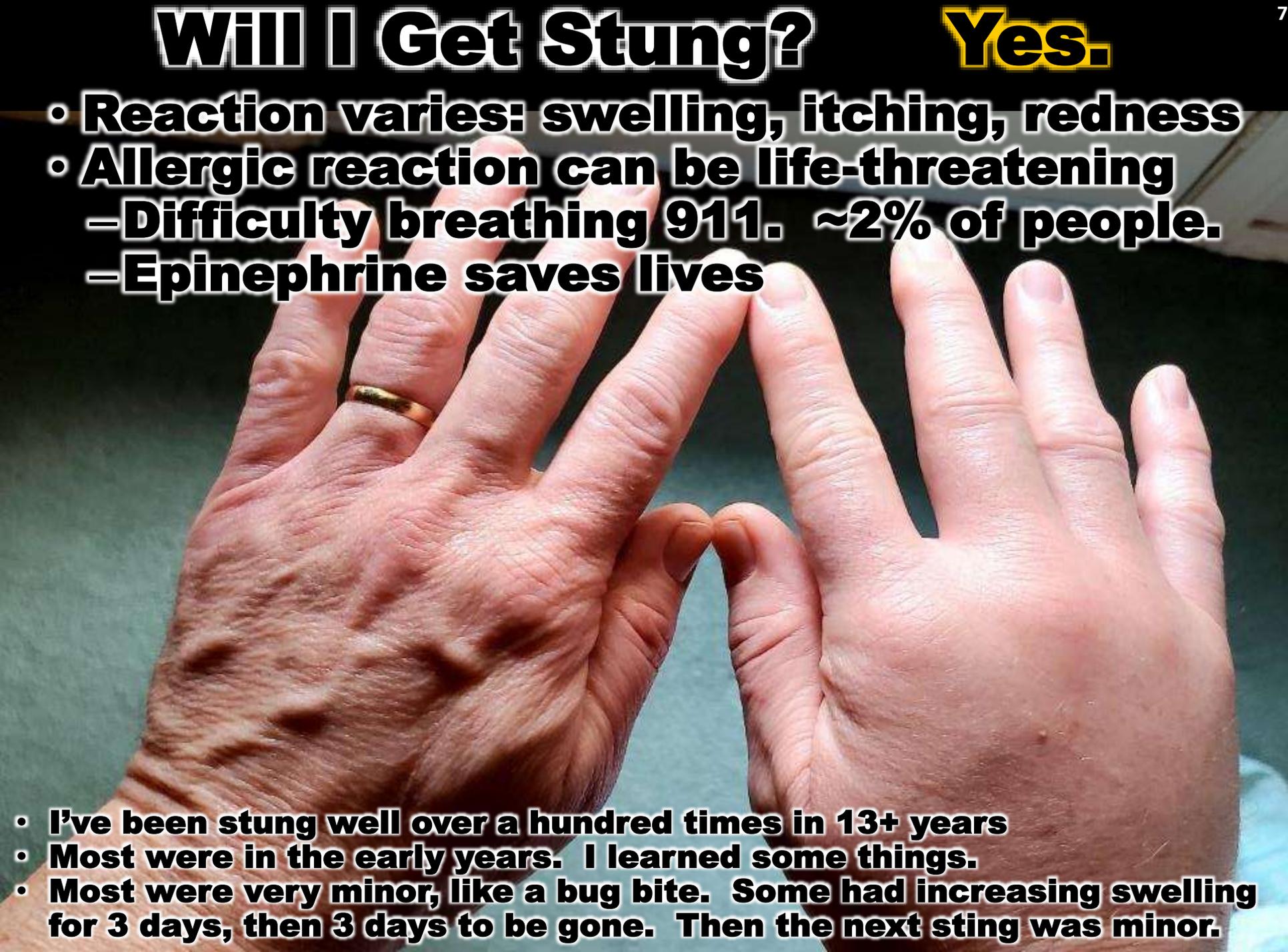
**Is Calvin a
Potential
Beekeeper?**



Will I Get Stung?

Yes.

- **Reaction varies: swelling, itching, redness**
- **Allergic reaction can be life-threatening**
 - **Difficulty breathing 911. ~2% of people.**
 - **Epinephrine saves lives**

- 
- The image shows two hands side-by-side. The hand on the left is significantly swollen, particularly around the fingers and the back of the hand, with a gold ring visible on the ring finger. The hand on the right is normal in size and appearance. This visual comparison illustrates the effects of an allergic reaction to a sting.
- **I've been stung well over a hundred times in 13+ years**
 - **Most were in the early years. I learned some things.**
 - **Most were very minor, like a bug bite. Some had increasing swelling for 3 days, then 3 days to be gone. Then the next sting was minor.**

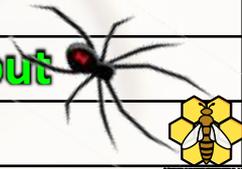
About Bee Stings

- **Scrape stinger out with fingernail or credit card**
 - Pinching to pull stinger would inject more venom
- **Each sting releases some alarm pheromone**
 - More bees will come there & sting
 - Open the gentle hives first
- **Watch for allergic reaction**
 - Work with a friend
 - If trouble breathing, call 911
 - Experienced beeks can develop life-threatening allergy
- **How to reduce stings**
 - Use smoke
 - Keep bees happy: queenright, stores, pests, housing
 - Minimize how often & how long you open the hive
 - When we open hives, we wear 3-layer ventilated suit & good gloves. Not always needed, but sometimes.
 - If genetics, consider changing queen
- **Some beekeepers say they need the dexterity of bare hands, but seem to count stings as merit badges**



What Could Go Wrong?

Danger	For Adventure	For Less Interesting Stories
Sting, Allergic Reaction	<ul style="list-style-type: none"> • Wear sweet perfume • Expose lots of bare skin • Thump hive, annoy bees • Swat the bees 	<ul style="list-style-type: none"> • Work with a friend • Wear protective equip, able to call 911 • If trouble breathing, Call 911, Epi-shot? • Don't swat bees
Heat Exhaustion	<ul style="list-style-type: none"> • Work long time in heat • Don't drink water • Don't take breaks • Work alone 	<ul style="list-style-type: none"> • Work with a friend • Drink water, electrolytes • Take breaks
Fire	<ul style="list-style-type: none"> • Drop smoker, match on tinder • Don't watch the smoker • No water or extinguishers 	<ul style="list-style-type: none"> • Monitor the smoker, match, flame • Have lots of water on hand
Muscle Strain	<ul style="list-style-type: none"> • Sit still when not beekeeping • Pick up heavy boxes alone • Bend your back, lift & twist 	<ul style="list-style-type: none"> • Lift with legs, not bent back • Have helper &/or use equipment • Stay square with the load • Limit the weight
Falls	<ul style="list-style-type: none"> • Slick footing on ladder • Climb ladder, lean out to side • No spotter at base 	<ul style="list-style-type: none"> • Solid footing • Have friend spotter at base • Center on ladder
Spiders	<ul style="list-style-type: none"> • Bare hand blind grab 	<ul style="list-style-type: none"> • Wear good gloves & watch out
Priority	<ul style="list-style-type: none"> • Honey harvest is top priority 	<ul style="list-style-type: none"> • Safety First



What Place Do I Need?

- **Level, dry, sunny, protect from winter wind, able to get cart near, low foot traffic**
- **Call local animal control to check laws**
- **Good approach (even if not required)**
 - **Fence (animals, kids, pushes bees up)**
 - **Water. Provide permanent water source.**
 - **Limit # of hives, consistent with area**
 - **Minimize robbing, limit open hives, honey**
 - **Be considerate to neighbors**
 - **Talk with neighbors before they talk to you**
 - **Wild bees were here before we got bees**
 - **Explain plans to be considerate to them**
 - **Ask how they feel**
 - **Reward neighbors with honey**

Neighborhood Apiary

North wind break,
incl skirt on shed

Workspace in back
& sides

6 ft Fence (bees fly up)
Enclosed (kids, animals)



Langstroth
10 frame

Mouse
Guard

Entrance reducer

Stand &
Bug barrier

Facing south or east

Mulch, Grass deterrent

Dry,
Level



Top Bar

Away from
foot traffic

Nearby sources of water, nectar, & pollen



Fort Worth Has Good Laws

- # Hives
- 6' fence
- Water
- Robbing
- Aggressive
- Know your local laws

10. Beekeeping/Apiary is allowed with the below regulations:

Ordinance 21653

- The responsible parties, who are beekeepers, must adhere to all applicable state laws concerning the care and handling of bees;
- Honeybee colonies are kept in hives with removable frames or top bars with dividers, which shall be maintained in sound working condition;
- The numbers of hives is tailored to the size of the lot as follows: a maximum of two hives on lots ¼ acre or smaller, four hives on lots larger than ¼ but less than ½ acre, six hives on lots larger than ½ acre but smaller than 1 acre. There shall be no limit on the number of hives on lots larger than one acre. The number of hives **may increase by up to 50% over the designated limits for a period not greater than sixty (60) days.** The Planning and Development Director or designee shall have the authority to require a person to reduce the number of hives or require other reasonable safety precautions in an apiary in order to abate any nuisance.
- If a hive's orientation has the hive entrances located perpendicular to and **within 25 feet** or less of an adjacent property line, **a solid wall, fence, hedge** or combination thereof **at least six feet high** shall be placed between hives and adjacent property lines of developed properties, and extends at least four (4) feet beyond the hive in each direction along the property line in order to minimize interactions between bees and the adjacent property
- A **convenient source of water** is provided to the bees on the property at all times during the year to discourage bees from congregating at swimming pools, hose bibs, or other water sources where contact with humans or pets may occur.
- No wax comb or other material that encourage robbing** by other bees is left upon the grounds of the lot; instead this material should be stored in sealed, insect-proof containers or closed buildings. For a period not greater than twenty-four (24) hours frames and hone harvesting equipment may be left in the bee yard to allow bees to clean excess honey from the equipment.
- If a colony exhibits **aggressive behavior** without provocation, the beekeeper will ensure that the colony is re-queened or otherwise managed using customary beekeeping practices;

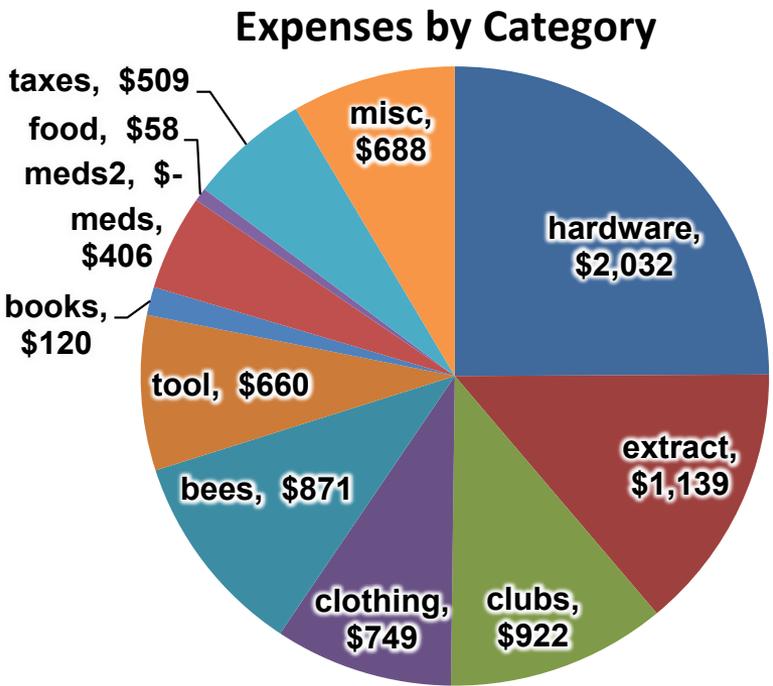
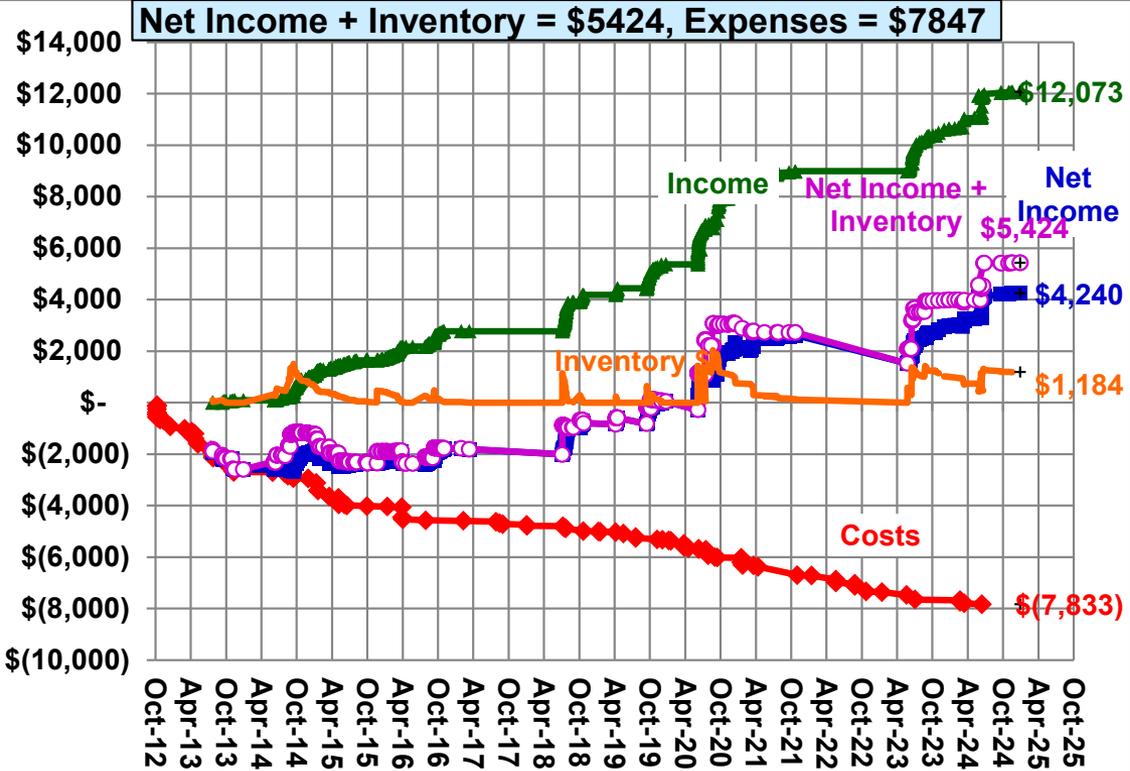
Lot size	# hives
< ¼ acre	2
¼ to ½	4
½ to 1	6
> 1 acre	No limit

<https://www.fortworthtexas.gov/departments/development-services/zoning/ordinance>
<https://www.fortworthtexas.gov/files/assets/public/development-services/documents/urban-agriculture.pdf>



How Much Does It Cost?

- It depends
- Ft Worth backyard, 1 to 3 hives for 12 years
- Spent \$7.6k & received \$11.6k, so net \$4k
- We didn't need all the stuff we bought



• For us, it's not about money, but it was nice to get honey & nice when net income was > 0



Can I Hire a Beekeeper? Yes!

- **Hiring a beekeeper has big benefits**
 - Tax savings for Ag Valuation
 - Improve gardens, plants, environment
 - Honey harvest
 - Learn beekeeping
 - Enjoy fascinating bees
- **Labor, Costs, & Knowledge are substantial**
 - Bees, Boxes, Equipment, Clothing, Tools
 - Setup, Inspections, Maintenance, Replacements
 - Know warning signs
 - Know what to do to help bees thrive
 - Hiring a beekeeper makes it easy for landowner
 - Costs vary based on agreements
- **A good contract is recommended**
- **Contact local bee club**
- **More info: [Hiring a Beekeeper](#)**



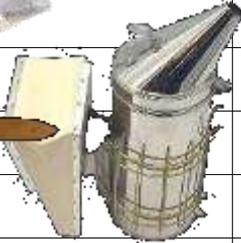
What Stuff Do I Need?

- **Join a club, take a class**
- **More likely to succeed!**



• **Get ventilated, 3-layer suit**



Suit with Veil		\$80 to \$240
Gloves		\$25 to \$30
Hive Tool		\$13
Bee Brush		\$15
Smoker		\$43
Bottom Board, Reducer		\$44
Inner Cover	• Some people build	\$18
Telescoping Cover	their wooden boxes,	\$37
Deep Hive Box	boards, frames	\$27
10 Deep Frames w/ Foundation		\$40
Two Medium Hive Boxes (at least)		\$26
20 Medium Frames w/ Foundation		\$39
Queen Excluder		\$10
Inner Feeder		\$11
Subtotal		\$430 to \$590
Nuc (bees with queen)		\$220
Subtotal		\$650 to \$800



• **Add 2nd hive for \$500 (\$250 + \$220)**

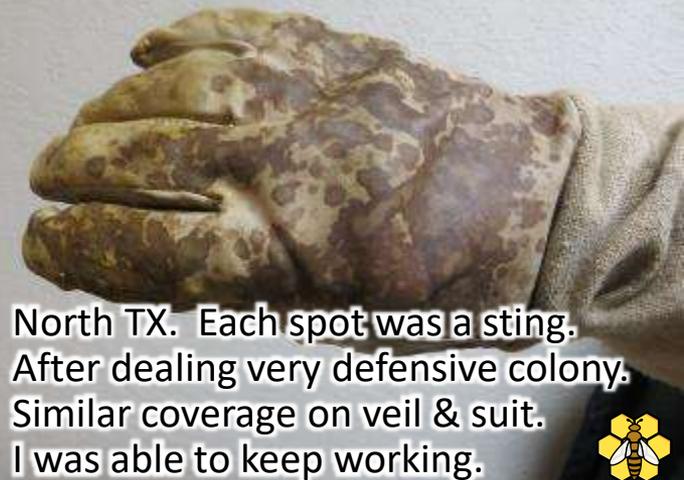


Do I Really Need Suit & Gloves?

- The web shows beeks with bare hands & no veil
- Every colony is defensive part of the time
 - Genetics, Low on stores, Dearth, Queenless, Mites, Weather, Grumpy Mood
- In north TX, a very small % of bees are very defensive
- I want to be able to keep working even when bees are grumpy or murderous
- When I open, I wear 3-layer ventilated suit, double gloves
- You get to choose, good luck



We are happy for Hawaiian Beekeeper Jen Rasmussen
https://www.facebook.com/jen_bee.520

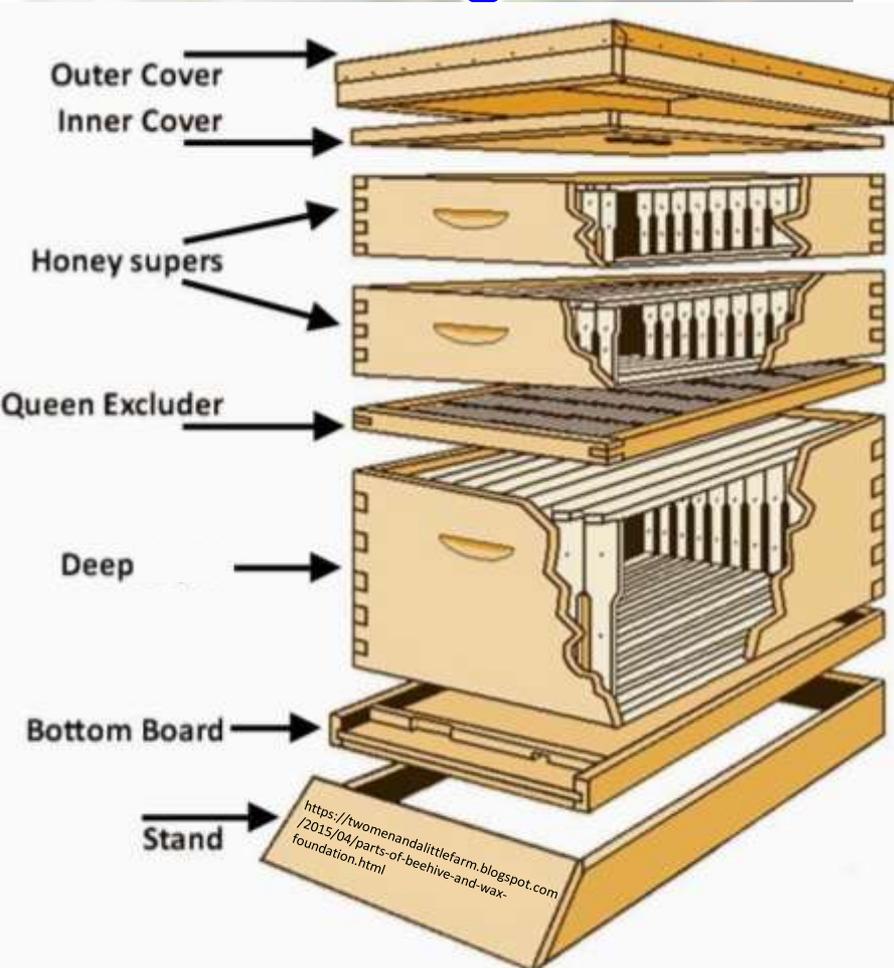


North TX. Each spot was a sting. After dealing very defensive colony. Similar coverage on veil & suit. I was able to keep working.

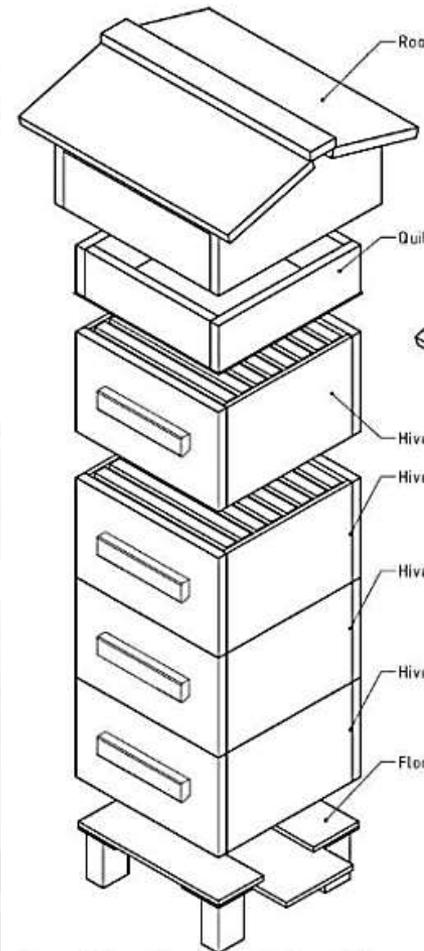


What Are the Hive Types?

Langstroth



Warre



- Langstroth is most common, easy, productive
- Many other types. Beekeepers are inventive.



What Foundation?

- **Bees in nature build wax comb from scratch**
- **Bees prefer bee-built comb or beeswax comb**
- **Plastic foundation is easier to inspect & harvest, & reduces cross-comb**
- **Help bees accept plastic**
 - **Coat with bees wax**
 - **Spray sugar syrup**
 - **Use queen excluder only with drawn wax above**



Bee-built comb



**Wood frame
Plastic foundation**

**Wood frame
No foundation**



Plastic with foundation

Plastic with deep cells



**Wood frame
Beeswax foundation**

<https://twomenandalittlefarm.blogspot.com/2015/04/parts-of-beehive-and-wax-foundation.html>



How Many Hives Should I Get?

- **Some people start with one hive**
- **Typical losses are 30% to 50% each winter**
 - **Losing 1 & having 1 is less sad than losing all**
- **Working 2 is much less work than twice 1**
- **Having more hives:**
 - **Helps you see problems**
 - **Adds options to solve problems**
 - **Move brood, stores, &/or bees from stronger hives to weaker hives**
 - **Helps you learn faster, see variety**



**If Two is Better Than One,
How Much Better is 864?**



How Do I Get Bees?

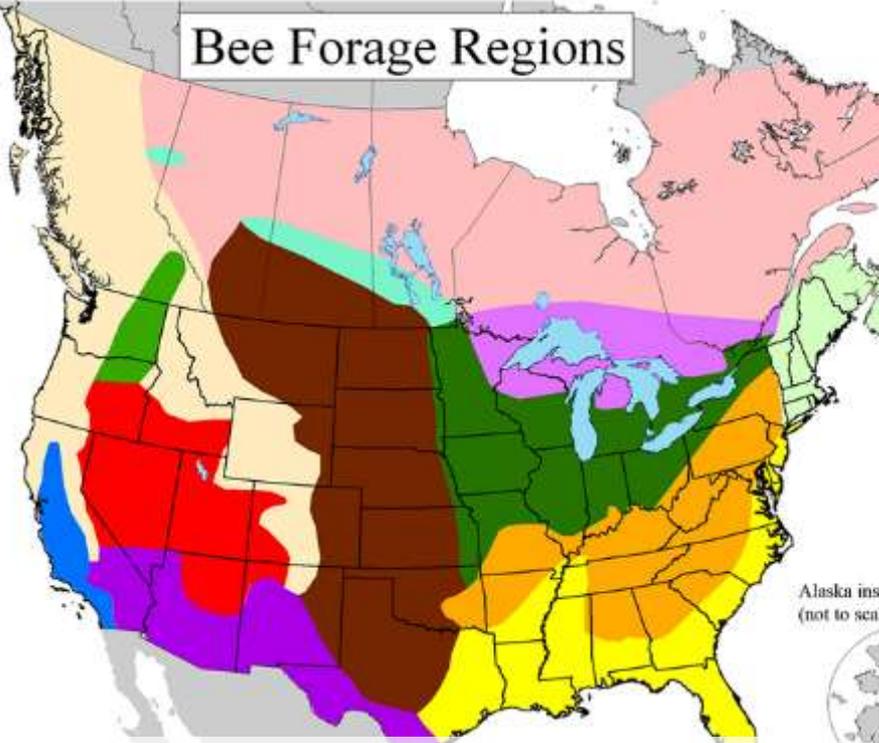
	Swarm	Package	Nuc (Nucleus)	Established Hive
What's Included?	Bees & Queen	Bees, Queen in cage, can syrup	Bees, accepted Queen, Brood	Bees, Queen, Brood, Food Stores
Brood	None	None	Yes, faster buildup	Yes
Honeycomb	None	None	Yes, drawn	Yes, drawn
Mites, Pests	Variable, test	Variable, test	Variable, test	Variable, test
Feed	Feed!	Feed!	Feed!	Inspect! Feed?
Queen quality	> 1 year	Young, ask seller	Young, ask seller	Ask seller
Honey Harvest	≥ 2 nd year	≥ 2 nd year	≥ 2 nd year	Possibly 1 st year
Survival	Variable	Good success	High success	High
Cost	Effort	~\$170	~\$220	~\$350+
Source	Local	Can ship	Local	Local



- **Swarm can be captured or bees can move into a swarm-capture box**
- **Or leave a small hole in your eaves (You know that's a joke, right?)**
- **Inspect all colonies & test for mites**



What are Good Plants for Bees?



<https://honeybeenet.gsfc.nasa.gov/Honeybees/Forage.htm>

- Region 1 - Alaska

Region 3 - South and Central California

Region 5 - Intermountain Region

Region 7 - Aspen Parkland & Peace River Valley

Region 9 - N. Great Lakes & S. Canada

Region 11 - Appalachian-Ozark Upland

Region 13 - New England & Atlantic Canada
- Region 2 - Western Mountains

Region 4 - Interior Northwest

Region 6 - Southwest Deserts

Region 8 - Great Plains

Region 10 - Agricultural Interior

Region 12 - Atlantic and Gulf Coastal Plain

Region 14 - Boreal Forest

List of Honey Bee Forage Species within Region 8 for the State of TX

Ordered by Begin Bloom Month

RETURN to map

USDA code	Family	Latin Name	Common Name	Plant Type	Begin Bloom Month	End Bloom Month	Sig
CILAL	Cucurbitaceae	<i>Citrullus lanatus</i>	watermelon	C	5	7	N
CUME	Cucurbitaceae	<i>Cucumis melo</i>	Cantaloupe, muskmelon, casaba	C	5	8	N
CUSA4	Cucurbitaceae	<i>Cucumis sativus</i>	cucumber	C	5	8	N
MESA	Fabaceae	<i>Medicago sativa</i>	alfalfa, lucerne	C	5	9	Y
GAPU	Asteraceae	<i>Gaillardia pulchella</i>	Marigold, indian blanket	F	5	6	Y
MELIL	Fabaceae	<i>Melilotus</i>	Sweet clover (white/yellow)	F	5	10	N
MONAR	Lamiaceae	<i>Monarda</i>	Horsemint, wild bergamot, bee-balm	F	5	8	Y
PRGLG	Fabaceae	<i>Prosopis glandulosa</i>	Mesquite	S	5	7	Y
TAMAR2	Tamnicaceae	<i>Taxmanx</i>	Tamansk, salt cedar, athel	S	5	9	Y
GOSSY	Maliaceae	<i>Gossypium</i>	Cotton	C	6	10	Y
HELIA3	Asteraceae	<i>Helianthus</i>	Sunflower	F	6	10	N
SOBIA	Poaceae	<i>Sorghum bicolor</i>	Sorghum, broom-corn	F	6	8	N
GUTET	Asteraceae	<i>Gutierrezia texana</i>	Bromweed	F	7	10	N
GUSA2	Asteraceae	<i>Gutierrezia sarothrae</i>	Matchweed, snakeweed	F	8	10	N
POLYG4	Polygonaceae	<i>Polygonum</i>	Smartweed, knotweed, fleece flower	F	8	9	N

List of Honey Bee Forage Species within Region 12 for the State of TX

Ordered by Begin Bloom Month

RETURN to map

USDA code	Family	Latin Name	Common Name	Plant Type	Begin Bloom Month	End Bloom Month	Sig
CUSA4	Cucurbitaceae	<i>Cucumis sativus</i>	cucumber	C	1	12	N
VACCI	Ericaceae	<i>Vaccinium</i>	Blueberry, huckleberry	SDB	1	6	N
CUME	Cucurbitaceae	<i>Cucumis melo</i>	Cantaloupe, muskmelon, casaba	C	2	8	N
ULMUS	Ulmaceae	<i>Ulmus</i>	Elm	TDB	2	4	N
QUERC	Fagaceae	<i>Quercus</i>	Oak	TDB	3	5	N
BESC	Rhamnaceae	<i>Berchemia scandens</i>	Rattan vine, supplejack	V. F	3	6	Y
GAPU	Asteraceae	<i>Gaillardia pulchella</i>	Marigold, indian blanket	F	4	10	N
MELIL	Fabaceae	<i>Melilotus</i>	Sweet clover (white/yellow)	F	4	10	Y
MONAR	Lamiaceae	<i>Monarda</i>	Horsamint, wild bergamot, bee-balm	F	4	10	Y
TRIN3	Fabaceae	<i>Trifolium incarnatum</i>	Crimson / Italian clover	F	4	6	Y
TRRE3	Fabaceae	<i>Trifolium repens</i>	White, dutch clover	F	4	10	Y
TRVE	Fabaceae	<i>Trifolium vesiculosum</i>	Arrowleaf, yuchee clover	F	4	7	N
VICIA	Fabaceae	<i>Vicia</i>	Velch, tare	F	4	9	Y
ACGR	Fabaceae	<i>Acacia greggii</i>	Catclaw, devil's claw, Texas mimosa	S	4	7	N
LIGUS2	Oleaceae	<i>Ligustrum</i>	Privet, hedge plant	S	4	7	N
PRGLG	Fabaceae	<i>Prosopis glandulosa</i>	Mesquite	S	4	6	N
ILEX	Aquifoliaceae	<i>Ilex</i>	Holly, yaupon	TEB	4	6	Y
CILAL	Cucurbitaceae	<i>Citrullus lanatus</i>	watermelon	C	5	8	N
ASTER	Asteraceae	<i>Aster</i>	Aster	F	5	11	N
SOBIA	Poaceae	<i>Sorghum bicolor</i>	Sorghum, broom-corn	F	5	10	N
TRSE6	Euphorbiaceae	<i>Triadica sebifera</i>	Chinese tallow tree, vegetable tallow	TDB	5	6	Y
GOSSY	Maliaceae	<i>Gossypium</i>	Cotton	C	6	9	N
GUTET	Asteraceae	<i>Gutierrezia texana</i>	Bromweed	F	7	10	N
SOLID	Asteraceae	<i>Solidago</i>	Goldenrod	F	7	11	N
GUSA2	Asteraceae	<i>Gutierrezia sarothrae</i>	Matchweed, snakeweed	F	8	10	N

HoneyBeeNet

How to Find Good Plants

- Choose water, sun, pollinator, size, season, color, type, more
- TxSmartScape.com



PLANT DATABASE SEARCH

<https://www.txsmartscape.com/plant-search>

Search our database of Texas SmartScape plants.

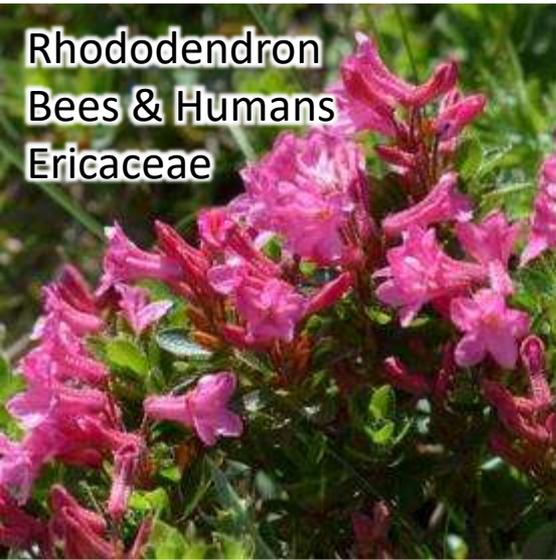
Enter part or all of a plant's common name or botanical name (e.g., lily):

AND/OR

Region	<input type="text" value="All"/>	Plant Type	<input type="text" value="All"/>	Light Requirement	<input type="text" value="All"/>
Water Demand	<input type="text" value="All"/>	Landscape Use	<input type="text" value="All"/>	Ornamental Color	<input type="text" value="All"/>
Native or Adapted	<input type="text" value="Native and Adapted"/>	Wildlife Value	<input type="text" value="Any"/>	Season	<input type="text" value="All"/>
Plant Form	<input type="text" value="All"/>	Plant Spread (ft.)	<input type="text" value="Any"/> to <input type="text" value="Any"/>	Plant Height (ft.)	<input type="text" value="Any"/> to <input type="text" value="Any"/>
Deciduous or Evergreen	<input type="text" value="All"/>				

• **Wildlife options: Bees, Birds, Hummingbirds, Butterflies, Mammals**

What Plants Are Toxic to Bees?



Rhododendron
Bees & Humans
Ericaceae



Yellow Jessamine
Bees & Humans
Gelsemium sempervirens



Mountain Laurel
Bees & Humans
Kalmia latifolia



California buckeye
Bees
Aesculus californica



Summer Titi
Bees, "purple brood"
Cyrilla racemiflora



<https://bee-health.extension.org/are-there-plants-that-produce-nectar-that-is-poisonous-to-either-honey-bees-or-humans/>

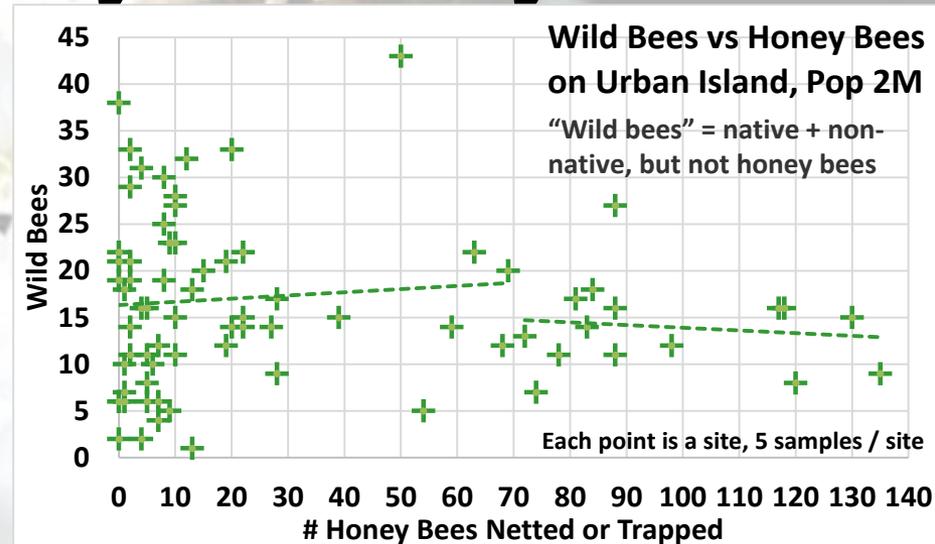
What Plants Are Toxic to Bees?

- **Aesculus californica**
 - **Angelica triqueta/apiciaceae**
 - **Asclepias spp**
 - **Astragalus spp, lentiginosus, miser**
 - **Camellia thea**
 - **Convolvulaceae**
 - **Corynocarpus laevigata**
 - **Cyrrilliceae**
 - **Ericaceae, Rhododendrum spp**
 - **Liliaceae**
 - **Loganiaceae**
 - **Ochrama lagopus**
 - **Solacaceae**
 - **Sophora microphylla**
 - **Tilia spp**
 - **Veratrum californicum**
 - **Some are toxic to bees**
 - **Some produce nectar that deters honeybees**
 - **Some produce unpleasant honey not fit for human consumption**
 - **<https://beekeepclub.com/frequently-asked-questions-about-beekeeping/#question-14—are-there-some-poisonous-flowers-to-honeybees>**
- **Different sources have different lists**
 - **Red are common with previous page**
 - **This source says some are toxic, & some are unpleasant, but doesn't identify which**
 - **We don't want any of them**



Effect of Honey Bees on Native Bees

- **Some reports suggest increasing managed bees can reduce native bees, but all say more study needed.**
- **Urban quantitative study**
 - **Counted bees, 15 sites, 24 traps/site, 6 months**
 - **No effect of honey bees on # of native bees**
 - **Non-native bees reduced if too many honey bees**
 - **Pollen supply reduced**
 - **1st half of honey bee pop increased wild bees 15%**
 - **Why? Maybe increased plant health & density?**
 - **More honey bees decreased # wild bees 15%**
 - **Effect is not huge (15% increase, then 15% decrease)**
- **Sample size is not large. More studies needed.**



Decline in wild bee species associated with honey bee
pubmed.ncbi.nlm.nih.gov/36755869

Do Honey Bees Compete With Native Pollinators?

- **It's complicated. Sometimes, yes. Depends on diversity & density of plants & pollinators.**
- **Honey bees help environment, plants, & people**
 - **Can benefit other pollinators, if density ok**
- **Agriculture requires honey bees**
- **Beekeeper work also helps native pollinators**

How to Help	Honey Bees	Native Pollinators
Plant pollinator-friendly plants	✓	✓
Grow flowers all year	✓	✓
Provide a water source	✓	✓
Minimize use of insecticides	✓	✓
Minimize use of herbicides	✓	✓
Provide shelters	✓	✓

Beeks Can Provide Bee Nests

Wooden block



Bamboo bundle



Bumble Bee Box

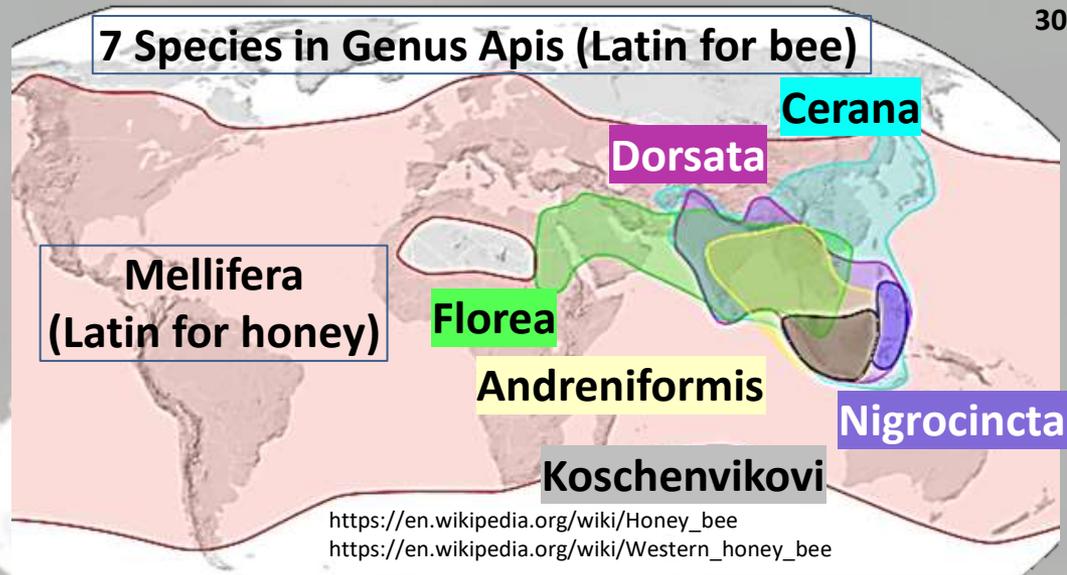


Beekeepers & Native Bee Protectors can increase collaboration



Honey Bees

- **7 honey bee species in genus Apis** →
- **31 Mellifera subspecies**
- **~10 types of European honey bee**
- **Inter-breeding changes traits, incl w African**



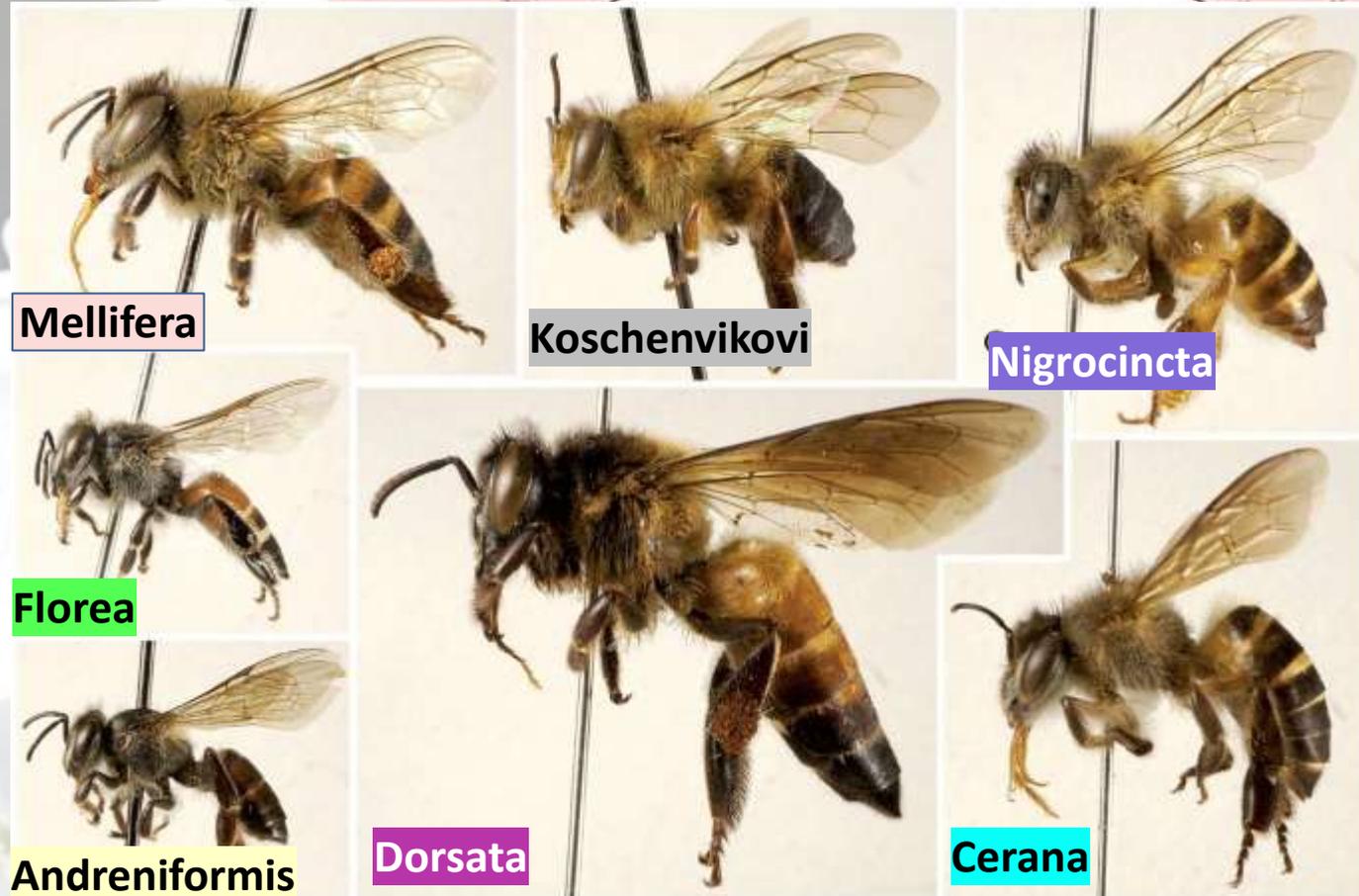
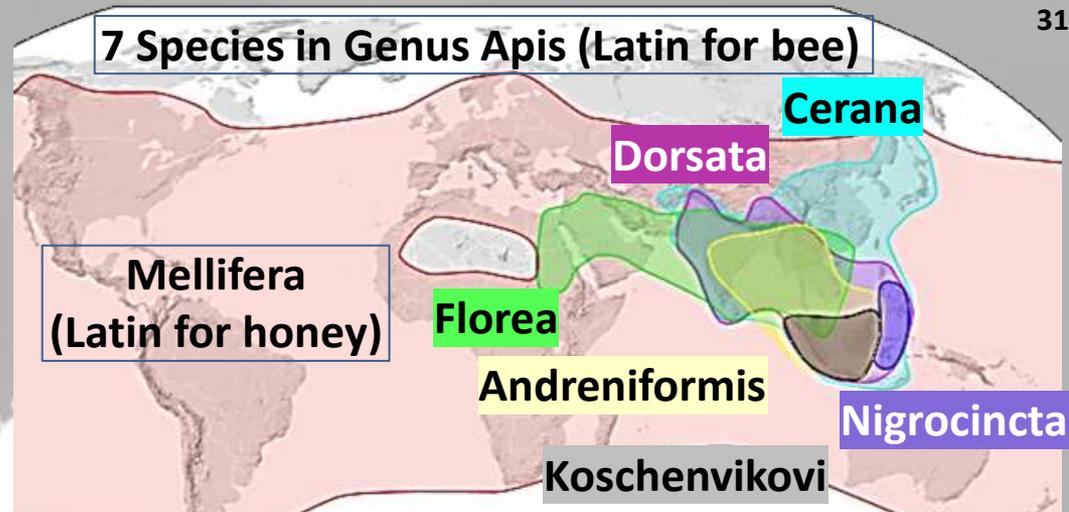
Per NC State Univ	Carniolan	Italian	Caucasian	German	Russian	Buckfast
Gentleness	High	Moderate	High	Low	Low-Mod	Low-Mod
Spring buildup	Very good	Good	Very low	Low	OK	Low
Over-wintering	Good	Good	OK	Very good	Very good	Good
Excess swarming	High	OK	Low	OK	OK	Low
Honey producing	Good	Very good	Low	OK	OK	Good
Disease resistance						
Varroa	-	-	-	-	+	-
Tracheal	-	-	0	-	+	+
American FB	+	0	0	-	0	0
Other	+	0	-	0	0	+
Propolis	Low	Low	High	OK	OK	Low
Color	Black	Light	Dark	Dark	Gray	Medium
Other traits	Low robbing. Good comb builders.	Heavy Robbing. Most Com'l.			Queen cells always present	Supersedure becomes defensive

source: <https://content.ces.ncsu.edu/the-different-types-of-honey-bees>

7 Species of Honey Bees

- **Family Apidae**
 - Honey bees, bumblebees, carpenter bees, long horn bees, many others
- **Genus Apis**
 - 7 species
 - Individuals can vary from pictures

7 Species in Genus Apis (Latin for bee)



European Honey Bee (Apis Mellifera)



Worker: 0.4 inch or 1 cm, Female
Lives 2 to 9 months
Barbed stinger
Can be >50,000 workers in Summer



Queen: 0.8 inch or 2 cm, Female
Lives 2 to 3 years
Un-barbed stinger
One queen per colony



Drone: 0.6 inch or 1.5 cm, Male
No stinger
Hundreds per hive Spring to Autumn

Bees, Wasps, Hornets

Honey Bee



Vespa crabro

European Hornet



Vespa crabro

European Hornet



Vespa crabro

European Hornet



Great Golden Digger Wasp

Sphex ichneumoneus



Sphex ichneumoneus



Cimbex americana

Elm Sawfly



European Wasp

Vespula squamosa

Southern Yellowjacket Wasp



Vespula pensylvanica

Western Yellowjacket Wasp



Vespula atropilosa

Prairie Yellowjacket Wasp



Dolichovespula maculata

Bald-Faced Hornet



Polistes aurifer

Umbrella Paper Wasp



Polistes dominula

European Paper Wasp



Polistes fuscatus

Northern Paper Wasp



Bombus huntii

Hunt Bumblebee



Bombus fervidus

Golden Northern Bumblebee

1 cm



Sphecius speciosus

Cicada Killer



Sphecius convallis

Pacific Cicada Killer



Sphecius grandis

Western Cicada Killer



Vespa mandarinia

Asian Giant Hornet



Vespa mandarinia

Asian Giant Hornet



Tremex columba

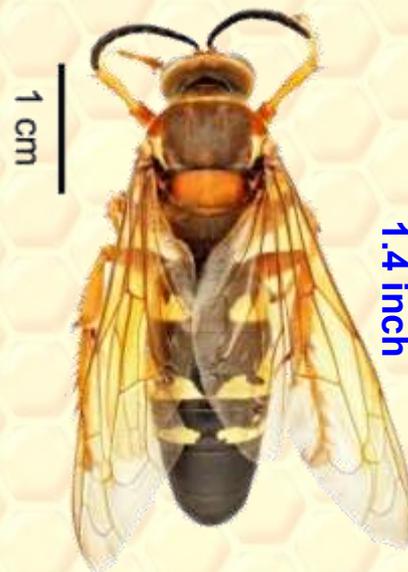
Pigeon Horntail

- **Cicada killers**
 - **Very common in TX**
 - **Beneficial species**
 - **Can be mistaken for Asian Giant Hornet**
 - **Bands are not smooth**



Which are these?

- **Asian Giant Hornets**
 - **Not in TX (yet)**
 - **Harmful to honey bees**
 - **Bands are smooth**



Sphecius speciosus
Cicada killer



Sphecius grandis
Western cicada killer



Vespa mandarinia
Asian giant hornet



Vespa mandarinia
Asian giant hornet



How Long Do Bees Live?



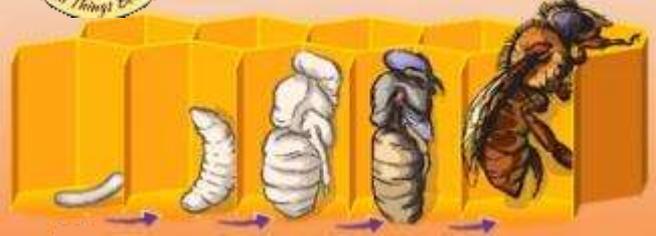
honeybeesuite.com/diaphanous-wings-they-soar/

- **Worker** bees wear out flying ~500 miles
 - Spring & Summer bees: 3 weeks in field
 - Winter bees can last 6 months*
 - bee-health.extension.org/how-long-do-worker-honey-bees-live/
- **Queens** can live 5 years, but productivity drops. Some replace queens 1 or 2 years
- **Drones** (males) are evicted late Autumn

Day	Worker in Cell	~Day	Adult Worker
1	Egg is laid	1	Adult emerges
3	Larva hatches	1 to 2	Clean cells, warm brood
3 to 6	Fed royal jelly	3 to 5	Feed older larvae & queen
9	Cell Capped	6 to 11	Feed younger larvae, cap cells
12	Pupa	12 to 20	Make wax, build comb, move food, circulate air, guard
21	Adult emerges	21 to 45	Field bee: find & bring pollen, nectar, propolis, water
		Up to 6 months	If Winter bee, then fly less & live longer, cluster for warmth, guard, feed queen, clean, occasional forage



woodsbeeco.com <https://youtu.be/Sof6N7G7Afs>



***Winter bee larva are fed less pollen, increasing their fat bodies, helping them store more protein for winter survival**

www.honeybeesuite.com/what-are-winter-bees-and-what-do-they-do/





How Much Work Are Inspections?

- 10 to 30 min / hive
- ~Weekly in Spring
- ~Monthly in Winter
- Think ahead
- Do we need to do anything to help the bees?

1. Queenright
2. Nutrition & water
3. Pests & Diseases
4. Housing

1) OUTSIDE OF HIVE

- # of bees coming & going
- Pollen going in
- Crowded entrance
- Fighting or robbing
- Weight of hive (food stores)
- Spotting (treat for nosema?)
- Dead bees on entrance or ground
- Bees on ground (mites? poison?)
- Equipment (box, stand, weathering)
- Water source (reliable, persistent)
- Neighbor issues?
- Tall grass (pest bridges)
- Sun/shade level

2) FRAME

- Temperament of bees
- # of bees on frames
- # of frames with bees
 - If < 6 frames, combine?
 - If full, split?
- Swarm signs
 - Queen cups, open, empty
 - Queen cells (larvae or closed w/ pupa, bottom of frame)
 - Supersedure cells (on frame sides)
- Brood pattern appropriate
- Larvae in jelly?
- Queen sighting or signs?
- Bees with deformities?

4) BEEKEEPER

- Order ahead of time (bees, queens, equipment, jars, labels, PDB, etc)
- Equipment for supering, harvesting, wintering
- Record keeping
- Learn more (bee club, books, internet, etc.)

3) FRAME

- Honey stores
 - If 80% full, add super
 - If low then feed
- Have 30 lbs for winter
- Pollen, Bee bread, add sub?
- Feeder status? Add?
- Pests (Small hive beetles, Wax moths, ants, etc)
- Nurse bee behavior
- Drones, drone cells
- Dirty comb (replace after ~5 years)
- Burr comb (remove?)
- Cell Level
 - Eggs at bottom of cells
 - Multiple eggs in cells
 - Slightly convex wax cappings
 - Perforations in wax cappings
 - Color & cond of wax & cappings
 - Mites on pupa?
- 300 Bee Level
 - Mite Count
 - Alcohol wash
 - Sugar Roll
 - Sticky board
 - Is it time to treat?

Inspections Vary by Season

- **Objectives are the same all year**
 - Is the colony Queenright? (healthy queen)
 - Do they have the honey & pollen needed?
 - Are there pests or diseases that need attn?
 - Housing. Too little or too much space? Solid boxes & stands?
- **MBA free [Resources](#)**
 - [Inspection Checklist](#) (blank forms)
 - [This-Month-in-the-Hive](#) inspections by season

Inspection Checklist, Outside

- Be ready for contingencies (clothing, boxes, frames, buckets, pollen sub, nectar sub)
- # of bees coming & going
- Crowded entrance
- Fighting or robbing
- Pollen going in
- Water source
- Sounds of bees
- Spotting
- Bees crawling on ground
- Dead bees on ground
- Equipment (weathering)
- Any neighbor issues
- Tall grass around hives (ant & pest bridges)
- Sun/shade level



Inspection Checklist, Inside

- Smoke before opening
- Temperament of bees
- Pests (SHB, moths, etc)
- # of bees on frames
- # of frames with bees
- If frames full, add box
- If not enough bees to defend space, reduce a box or combine
- Queen health
 - Brood pattern
 - Queen cups (open, no larvae)
 - Queen cells (larvae or closed with pupa)
 - Supercedure cells (on frame sides)
 - Queen sighting
- Stores (honey, pollen)
- Cells
 - Eggs, single at base
 - Larvae healthy
 - Perforations in wax
 - Wax color & condition
- Bees with deformities
- Nurse bee behavior
- Drones, drone cells
- Old comb (replace)



Inspection Checklist

- Mite Count
 - Sugar roll, alcohol, sticky board
 - Need treatment?
 - See [Varroa Mite](#)
- After inspections
 - Place orders ahead of time (bees, queens, jars, labels, equipment, etc)
 - Equipment for supering, harvesting
 - Record keeping
 - Learn more: Attend Bee Club, books, web, etc.



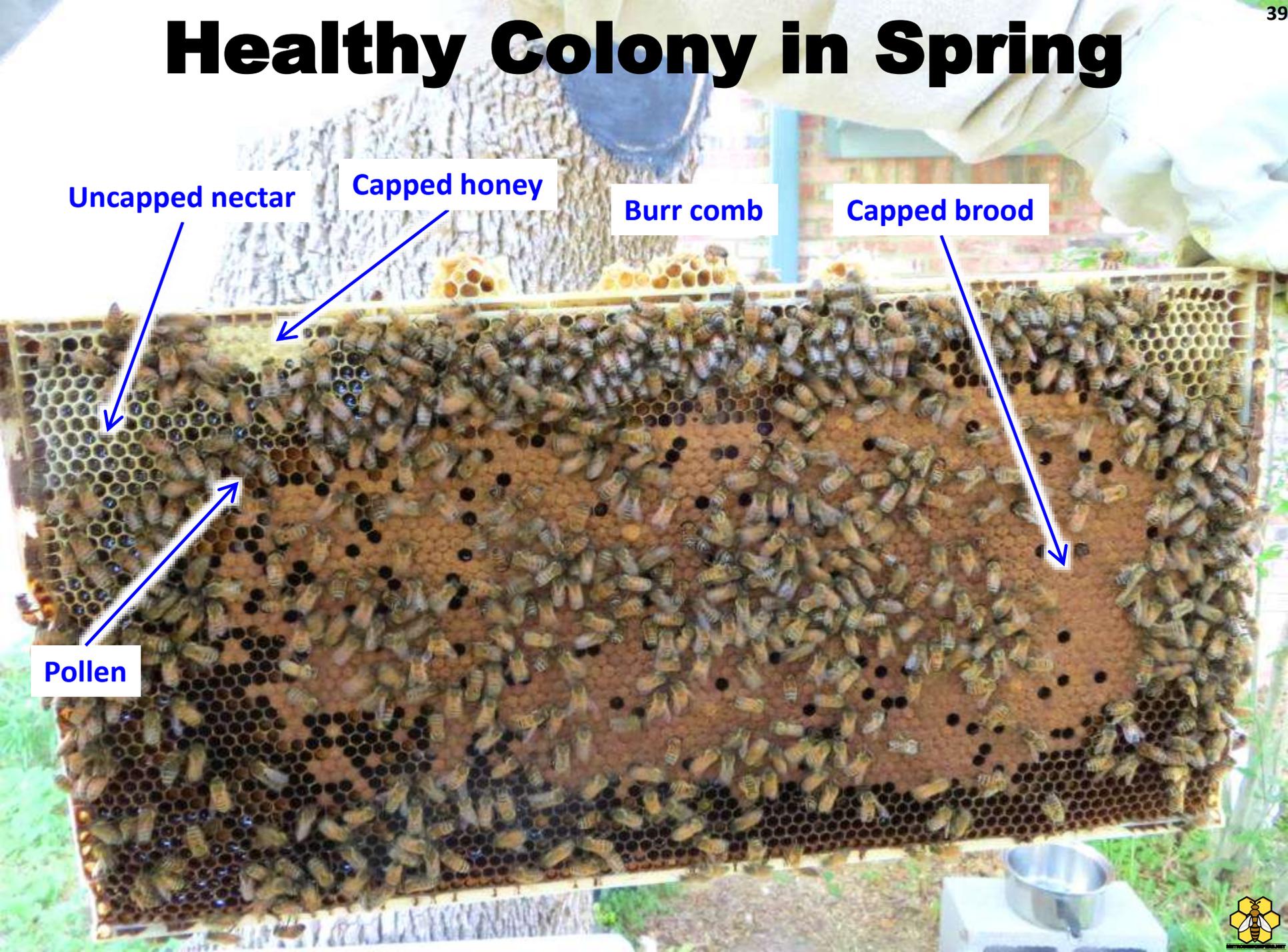
Inspections & Actions by Season

Queen-
right
Nutrition
Disease
Housing

	Spring	Summer	Fall	Winter
Temp	Eve > 50° F	Day > 95° F	Eve < 50° F	Day < 50° F
Blooms	Lots after mid-Feb	Sparse if dearth. Often Autumn surge.		Low until early Feb
Activity	Lots		Lots on warm days	None on cold days
Inspect	Weekly	1 to 2 weeks	2 to 4 weeks	4 to 6 weeks
Queen	Lots brood		Declining brood	Little/no brood
Bees	8 to 16+ frames	6 to 16+ frames	6 to 10+ frames	4 to 8 frames
	Look for healthy brood, healthy adults, dead bees on ground			
Honey	Feed new hives for a year. > 40 lbs honey or feed syrup (or fondant if <50°F)			
Pollen	Feed pollen until bees stop taking	> 1.5 frames or feed		Can add patties or open feed
Water	Ensure persistent water supply all year			
Varroa	<u>Test 2 to 4 times/year.</u> Treat? <u>When mites < 2%.</u> <u>When mites > 3%.</u>			
SHB, Moths	Remove/add boxes consistent with enough bees to defend the space			
Boxes, Frames	Keep 50% to 70% bees/frame. More → swarm. Less → pests.		Remove empty. Discard old.	Store wax frames. Clean, repair.
Excluder	Add if desired. Stop feeding syrup before nectar flow, if plan harvest.		Remove > harvest	No. Queen must move with cluster.
Entrance Reducer	Remove if excess congestion. We use all year (wooden in summer)		Add	Yes

- **Some beeks intervene less (don't feed, no entrance reducer)**
- **You get to choose how much you do to help them survive**

Healthy Colony in Spring



Uncapped nectar

Capped honey

Burr comb

Capped brood

Pollen



How Can I Find the Queen?



Here She Is



How Can I Find the Queen?



Here She Is



- **But, seriously, you don't need to find her all the time**
- **You can tell if she's healthy by seeing brood appropriate to the season**
- **Treat every frame as gentle as if she's there**

How to Find the Queen

- **Most inspections don't need to find her**
 - You can tell if she's healthy if brood is appropriate to the season
 - Treat every frame gently, like she's there
- **When you do need to find her**
 - Be able to recognize the queen vs drone
 - Look first near the brood
 - Remove outside frame, check for queen, set frame outside hive box
 - Keep frames over hive box, don't drop queen outside
 - Slide 2nd frame sideways, away from 3rd frame, lift & check for queen. If not, put inside box by wall.
 - Continue through the brood box until you find her
 - If you need to move to the next box, set aside the box you have searched, so she can't move to there
- **Practice finding queen. [CarolinaHoneyBees video](#)**
- **Maybe get marked queens (but marks can come off)**

Queen



Drone



Worker



Why Smoke Bees?

- **Smoke masks honeybee's alarm pheromone**
- **Reduces bee defensiveness**
- **Reduces stress to bees, incl nearby hives**
- **Reduces beekeeper stress**
- **Allows more work in less time, which further reduces stress to bees**

- **Don't overdo it**
- **Too much smoke or too hot smoke can harm bees & honey**



When to Add or Remove a Box?

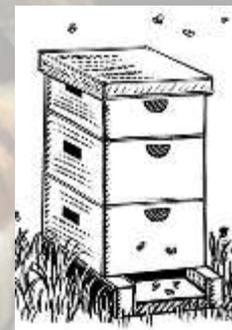
- **If frames are ~70% full & growing, add a box**
 - **Or bees may swarm**
 - **Consider checkerboarding frames of honey** →
 - **Don't split brood**
- **If frames are empty & bee population is declining, remove a box**
 - **Or hive beetles & wax moths will grow**
 - **Bee population determines how much space they can defend from pests**
 - **Do not remove brood. Keep brood together.**
 - **If some frames have honey, pull empty frames from a lower box & leave the honey**

New box	New	Honey								
Orig box	Honey	New								



How Do I Split a Hive?

- **Set up a new box at a good location**
- **Take about half the brood, stores, & nurse bees from old hive to new box**
- **Make sure both hives have at least**
 - **1 frame of fresh eggs**
 - **2 frames of capped brood, w/ nurse bees**
 - **2 frames of honey & pollen or bee bread**
- **If you want them to raise a queen, you don't need to find the old queen, but it's best if you move the old queen to the new hive box. That reduces swarm pressure.**
- **If you got a new queen, install her in a cage in the box without a queen. Requires finding old queen.**
- **Feed both colonies to encourage acceptance**
- **If new hive is within 2 miles of the old, put branches at the entrances to force field bees to reorient**
- **Check in 3 to 4 weeks for a laying queen in both**
- **Inspect & add boxes as both hives grow**
- **More info:** carolinahoneybees.com/how-to-split-a-beehive www.honeybeesuite.com/splits-2



Start with only 1
deep each

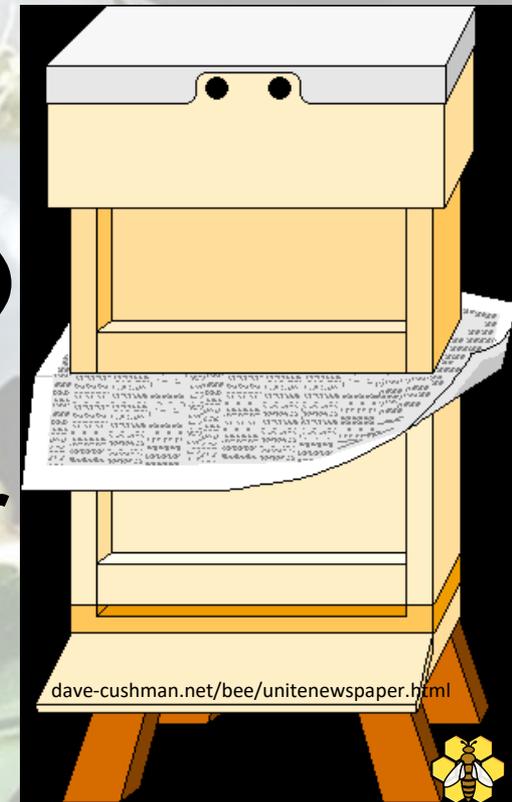


<https://i.pinimg.com/736x/a1/b0/de/ab99e21128a5a8b635e931a314e81c5-bee-clipart-bee-drawing.jpg>



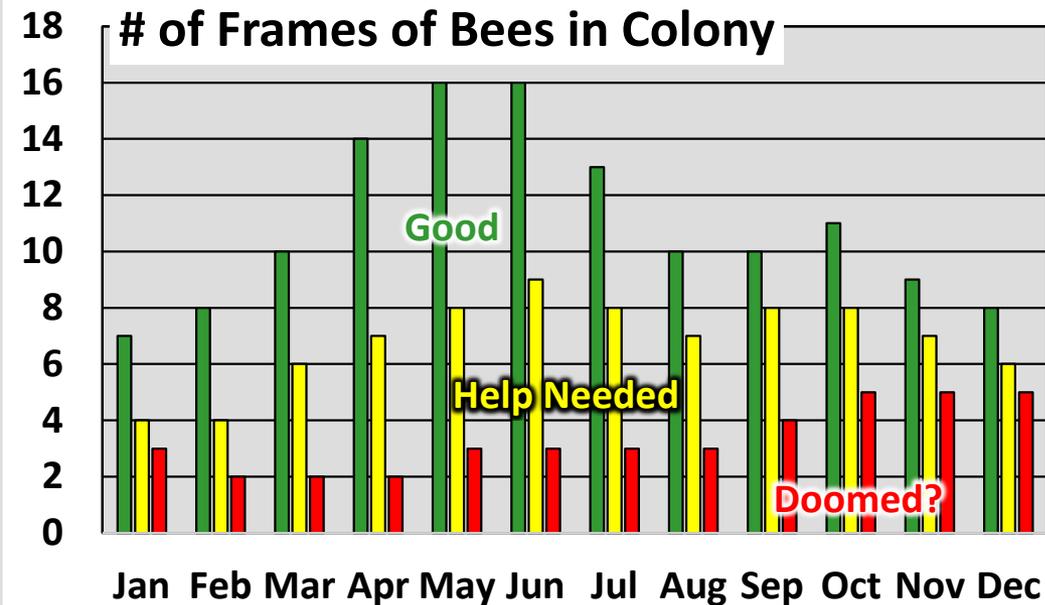
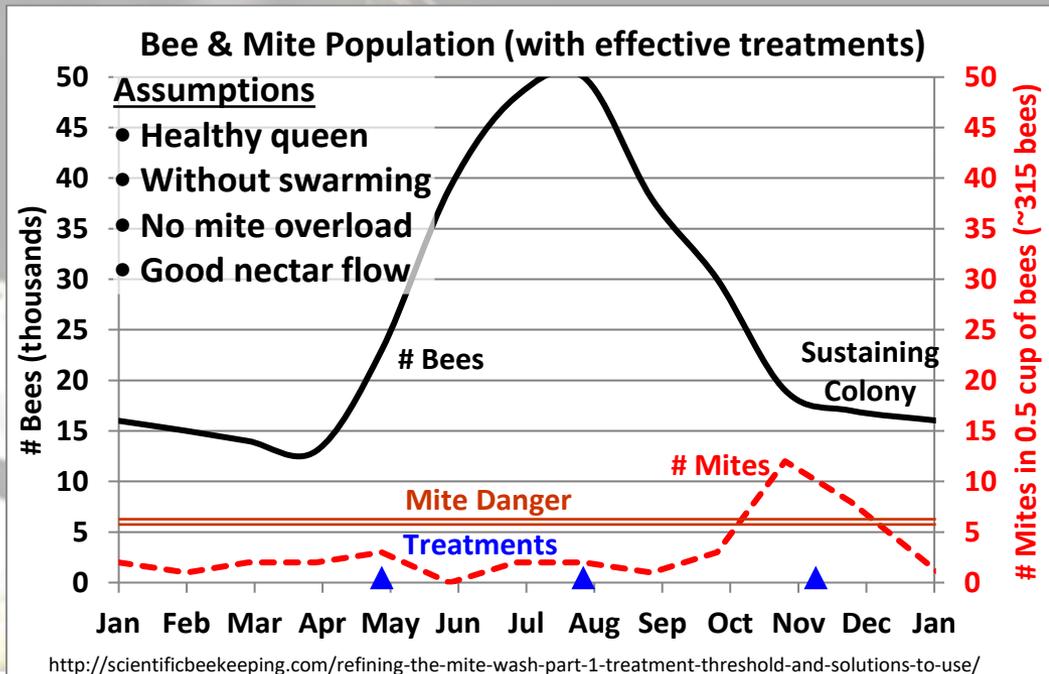
How Do I Combine Hives?

- **Combine when at least 1 hive is too weak to survive**
- **Make sure both colonies have low pests & disease & not laying workers**
- **Find the weaker queen & “retire” her, after you’re sure other queen survives**
- **Remove covers of the stronger hive, use smoke**
- **Lay down a layer of newspaper**
- **Add box(es) of weaker hive on top of newspaper. Upper entrance is fine.**
- **Add inner feeder with syrup (in season)**
- **Put the inner cover & top cover on top**
- **Within a few days, the bees will chew through the paper & accept each other**
- **If you remove the paper, it saves the bees some work, but adds disruption**



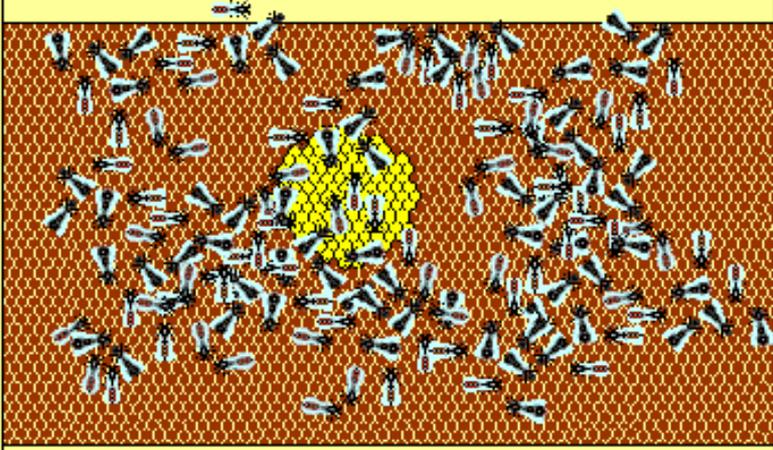
How Many Bees in a Hive?

- **Typical colony**
 - **Winter**
 - **15,000 bees**
 - **7 frames**
 - **Peak**
 - **50,000+ bees**
 - **20+ frames**

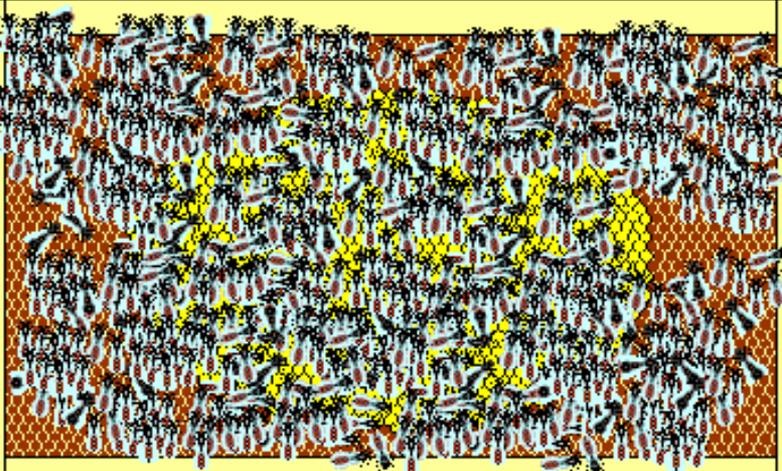


- **Some hives survive winter with 2 frames of bees, depending on winter severity & bee hardiness**
- **Some beeks combine hives if at red levels**

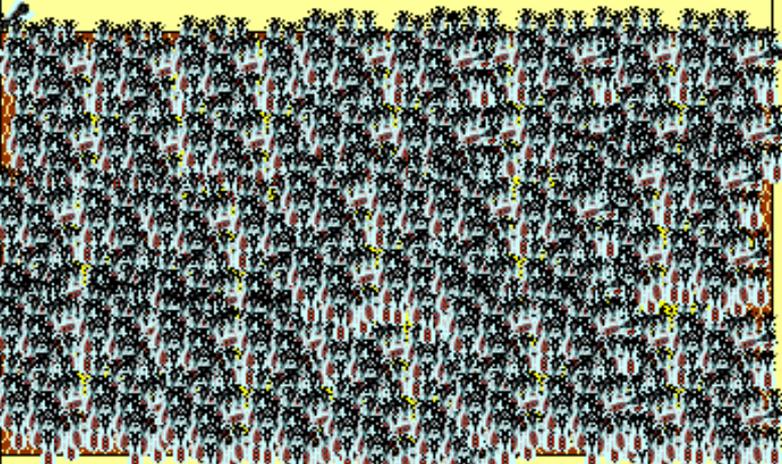
How Many Bees on a Deep Frame?



125 capped cells
150 bees
10 frames = 3,000 bees



1100 capped cells
750 bees
10 frames = 15,000 bees



1800 capped cells
1500 bees
10 deep frames = 30,000 bees
(add a box, dude!)

~3400 cells/side/deep
~2,240 cells/side/med

Thanks to Dave Cushman

<http://dave-cushman.net/bee/beesest.html>



What if My Bees are Gone?

- **If you don't act quickly, small hive beetles & wax moths destroy honey, combs, & frames**
- **If you catch it & act quickly, you can save the honey, wax, & frames**
- **Regularly watch bee activity at hive entrance**

SHB larva

Wax Moth larva

- **Scavengers, invade under-defended frames**
- **Keep colony strong. Locate hive in sun.**
- **Keep space consistent w/ bee population**



What if I Suspect Poisoning?

- **Signs of poisoning:**
 - **Dead bees w/ “tongues” out**
 - **Dead bees on ground by hive**
- **Try to find source & fix it**
 - **Spraying (city or neighbor)**
 - **Plants treated in your bee fly zone**
 - **Poisonous plants in bee fly zone**
 - **Treatment not following directions**
- **Report dead bees call 512-463-7622**
- **To get dead bees tested, contact Jonathan Barber, USDA Lab, Jonathan.Barber@ams.usda.gov, Main: 704-867-3873, Direct: 704-833-1523**
 - **Ref: <https://honeybeelab.tamu.edu/beekeeper-resources/bee-removal-and-sample-submission/>**
- **You can get on list to be notified of spraying**
 - **If you know city will spray for mosquitoes, you can cover hives at night during spraying with damp sheet, & remove it before dawn**



www.motherjones.com/wp-content/uploads/shutterstock_94126963_0.jpg

Report Pesticide

Exposure

- **Bees may be exposed:**
 - When foraging
 - From in-hive products
- **Symptoms include:**
 - Dead or dying bees near hive or on plants
 - Spinning, twitching, disoriented bees
 - Regurgitation with an extended tongue
 - Abnormal behavior
- **Report suspected pesticide-related bee-kills in Texas 512-463-7622**
- **EPA uses reports to identify patterns of bee kills, inform pesticide regulatory decisions.**
- **Info: www.epa.gov/pollinator-protection**

Immediately report bee-kills suspected to be associated with pesticides to the Texas Department of Agriculture 53

Dr. Chrissy Mogren

Life Scientist, Pesticides & Toxics
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270
Office: (214) 665-6579



What is Natural Beekeeping?

- **No official definition, so you get to define it**
- **From Randy Oliver:**
 - **Bees “naturally” live in irregular tree cavities far off the ground, not in rectangular boxes located at knee level**
 - **In an apiary, we put bees in boxes, crowd hives together, take their honey, feed them syrup, open hives, & disturb them. Natural?**
 - **Before varroa, we were all natural beekeepers**
 - **Migratory beeks herd stock to better pasture**
 - **Commercial migratory pollinators are hard-working heroes, critical to agriculture**
 - **scientificbeekeeping.com/the-rules-for-successful-beekeeping/**

Range of Intervention

	Nature	Natural	Bee-friendly	Max Productivity
Home	Hollow tree	Man-made boxes (wood, plastic, styrofoam)		
Add Supers	None	Maybe	Add when population & stores warrant	
Comb	Bee-built		Bee-built or plastic	Plastic
Inspect	None	None or Minimal	Find problems in time to help	Fewer inspections
Feed	None		Feed syrup &/or pollen as needed	
Vitamins, etc	None		Maybe	Usually
Medicines	None		Solve problems. Some use organic acids, essential oils, synthetic chemicals.	
Drone Brood Removal	No		Can be done to reduce varroa mites	
Harvest	No	Maybe	Usually	Usually
Migratory	No		Maybe for food	Pollination, honey → \$
Effects on Bees	More pests, disease, starvation, suffering, losses		Ease suffering. Increase survival.	Increase survival. Adds stress to bees?

- **Bee-friendly beekeepers give bees more attention & care**
- **Commercial beekeepers have bee livestock, free-range cattle**
- **It's not really distinct lines between types of beekeepers, but various options. You get to choose.**



When Should I Re-Queen?

Option	Pros	Cons
• Let hive re-queen	• Natural	<ul style="list-style-type: none"> • Potential for undesirable genetics • Might not succeed
• Re-queen when queen is weak or gone	• Lower cost & work	<ul style="list-style-type: none"> • Might not be able to get queen when needed • Might not be able to combine colonies
• Re-queen yearly	• More honey, likely	• More cost & work
• Re-queen if aggressive	• Ft Worth requires action: re-queen, move	• Or move hive away from people

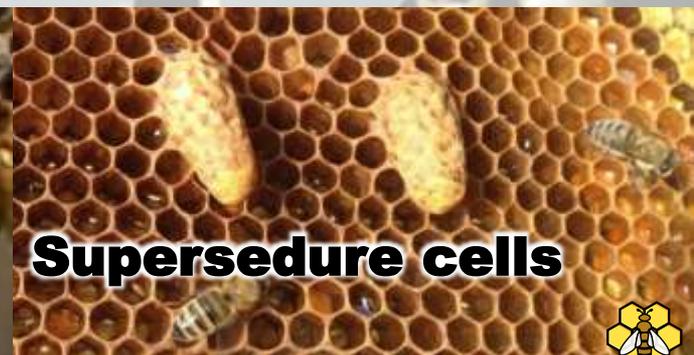
Depends on beekeeper's objectives

When Should I Re-Queen?

- **Some beekeepers let bees decide when to replace queen**
 - **Swarm: Queen leaves with ~half the bees. Remaining bees raise new queens from eggs. This is how colonies reproduce. Queen cells are usually on bottom of frame.**
 - **Supersedure: Bees raise new queens because old queen is not healthy. Queen cells are usually on side of frame.**
 - **New queens fight until one remains, winner may be damaged**
 - **New queen takes mating flight, which has risks**
 - **Beekeeper has low/no influence on drone genetics**
 - **Queen might not mate well, best success is April thru Aug**
- **Some beekeepers replace the queen every year or two in Spring**
 - **May increase honey production & colony health for Winter**
 - **Beekeeper gets to choose genetics source & timing**
- **Each beekeeper decides level of intervention**
- **If colony overly-defensive due to genetics**



Swarm cells



Supersedure cells



Bee Removals

- **Bees can be a swarm or established hive**
- **If people don't like the bees there, call a bee removal expert**



Swarms, no comb



Established, w/ comb

- **Removing a colony from a building can be a lot of work & require repairs. Call an expert.**

How Do I Ask for Bee Removal?

• **Metro Beekeepers**
metrobeekeepers.net/bee-removal/

• **TX Apiary Inspect Svc**
txbeeinspection.tamu.edu/bee-removal/

Browser address bar: <https://metrobeekeepers.net/bee-removal/?p=288261131572>

A Swarm of Honey Bees

A swarm of bees is a cluster of bees with no honey comb. A swarm of bees will only stay temporarily because they are looking for a permanent home where they will build honey comb, store honey, and raise more bees. It is very important to report swarms quickly so the bees don't end up in a location where they are not wanted (in a wall, attic, etc). Beekeepers may rescue swarms for only a small fee, sometimes free, depending on how hard it is to retrieve them.

A Hive of Honey Bees

A hive of bees is an established colony with wax comb, but you might not see the comb. Bees going in and out of a small opening typically means there is a hive in the structure. A hive can contain 50,000+ bees depending on the season and age of the colony. Hive removal from a structure can be labor intensive, and most beekeepers will charge a fee.



Use a SWARM of Honey Bees

Use a HIVE of Honey Bees

Bee Removal

Bee Removal Disclaimer

The beekeepers listed below have registered with the Texas Apiary Inspection Service as required by Texas Agriculture Code, Section 131.045, and have submitted a statement of intent to be added to this list. Beekeepers registered with the Texas Apiary Inspection Service are excluded from complying with the Texas Structural Pest Control Act pursuant to Texas Occupations Code, Chapter 1951, Structural Pest Control, Section 1951.056. (See: <http://www.statutes.legis.state.tx.us/Docs/OC/htm/OC.1951.htm>)

• **TXAPBR**
txapbr.org/



Texas Association
OF
Professional Bee Removers

Home About Us For Removers

* Saving Honey Bees *

* Protecting the Public *

The Texas Association of Professional Bee Removers is a 501(c)6 professional trade association dedicated to representing the best interests of those who perform honey bee removals in Texas. Our goal is to ensure that our members remove live bees as safely as possible and with the highest ethical business practices.



How Can I Shoo Away Bees?

- **Things to try when unwanted bees visit (this is not a swarm or colony, no comb)**
- **Have plants that bees dislike (peppermint ...)**
- **Smoke the area, bees & surfaces**
- **Spray area w/ mix of 10-20 drops of natural oils + 6 Tablespoons witch hazel**
 - **Various oils recommended**
 - **Peppermint, Citronella, Eucalyptus, Clove, Geranium, Cedarwood, Tea Tree, Cinnamon**
 - **Good summary www.tipsbulletin.com/natural-bee-repellent/**
- **Or crush garlic in water to make spray**
- **Several commercial products use natural oils to temporarily clear supers for honey harvest**



What Causes Bee Colonies to Die?

Queen Failure

Lost productivity, age
 Damage by inspection
 Damage in duel(s)
 Mating flight fails
 Other items on this pg

Parasites & Pests

Varroa Mites
 Small Hive Beetle
 Wax Moths
 etc

Poor Nutrition

Not enough nectar & pollen
 Flowerless landscapes
 Mono agriculture
 Herbicides

Diseases

Viruses via varroa
 Foulbrood
 Nosema
 etc

Animals

Small Mammals (skunks, mice)
 Large Mammals (livestock, bears, beekeepers, people)
 Birds, Wasps



Pesticides

Neonicotinoids
 Pyrethroids
 Fungicides
 Herbicides
 etc

- **Varroa is biggest single threat to bees, but watch for all**
- **Combined threats compound individual harmful effects**
- **Beekeepers have responsibilities to inspect the hives & care for their bees. Use non-harsh-chemical methods.**
- **Inspect for queenright, pests, diseases, food, housing**



What Are Varroa Mites?

- **Varroa mites grow inside honey bee cells**
- **Attach to pupa & adult bees & eat**
- **Not easy to see on adult bees**
- **Need to test to know varroa count**

Not easy to see on adult bees. Usually on belly.



Photo by Kathy Keatley Garvey
Agriculture and Natural Resources, University of California
https://ucanr.edu/blogs/bugsquard//blogfiles/62719_original.jpg

<https://beewellhoneyfarm.com/wp-content/uploads/2020/08/varroa.jpg>



How Do I Test for Varroa?

	Sticky Board	Sugar Roll	Alcohol Wash
Pros	Easiest, Not bother bees	Easy	Most accurate
Cons	Least accurate	Less accurate	Kills 300 bees
Process	Put sticky board under screened bottom board. Can be board or tray with oil you add, or buy sticky boards (pre-made sticky boards cost \$4 to \$6 ea). Remove after 1, 2, or 3 days.	Put 1/2 cup of nurse bees (not queen!) in jar + 2 TB powdered sugar & screened lid, shake 2 min, pour mites & sugar thru screen, release bees, count mites, kill mites	Put 1/2 cup of nurse bees (not queen!) in jar with alcohol, swirl 30 sec, count mites. This kills bees & mites.
Warning Limit	May: 9 mites/24 hrs Aug: 12 mites/24 hrs	4 mites (some mites are missed)	May: 6 mites (2%) Aug: 9 mites (3%)
Links	betterbee.com/instructions-and-resources/using-sticky-boards-to-monitor-varroa-mites.asp ontario.ca/page/varroa-mites	carolinahoneybees.com/varroa-mites-and-bees/	scientificbeekeeping.com/first-year-care-for-your-nuc/

• All these links are good; read them all. Test again after treatments.



How Do I Treat for Varroa?

- **Not all beekeepers agree on mite management**
- **If you do nothing to manage varroa, your bees will die**
[Danielle Downy](#), Exec Dir Project APIS m (www.projectapism.org)
- **Most colonies will die from varroa & varroa-carried virus within 2 years, unless beekeepers reduce mites. Not controlling mites is inexcusable, & spreads mites & viruses to neighboring bees.** [Randy Oliver](#)
- **There is no hope of bees who can survive without treating until we stop treating.** [Michael Bush, Natural Beekeeper](#)
- **There are effective methods without harsh synthetic chemicals**
 - Drone brood trapping, queen caging for brood interruption, screen bottom, powdered sugar
 - Organic acids (oxalic, hops, formic)
 - Apivar is synthetic chemical fallback, losing effect
 - MBA Resource [How to Help Bees Against Varroa Mites](#)

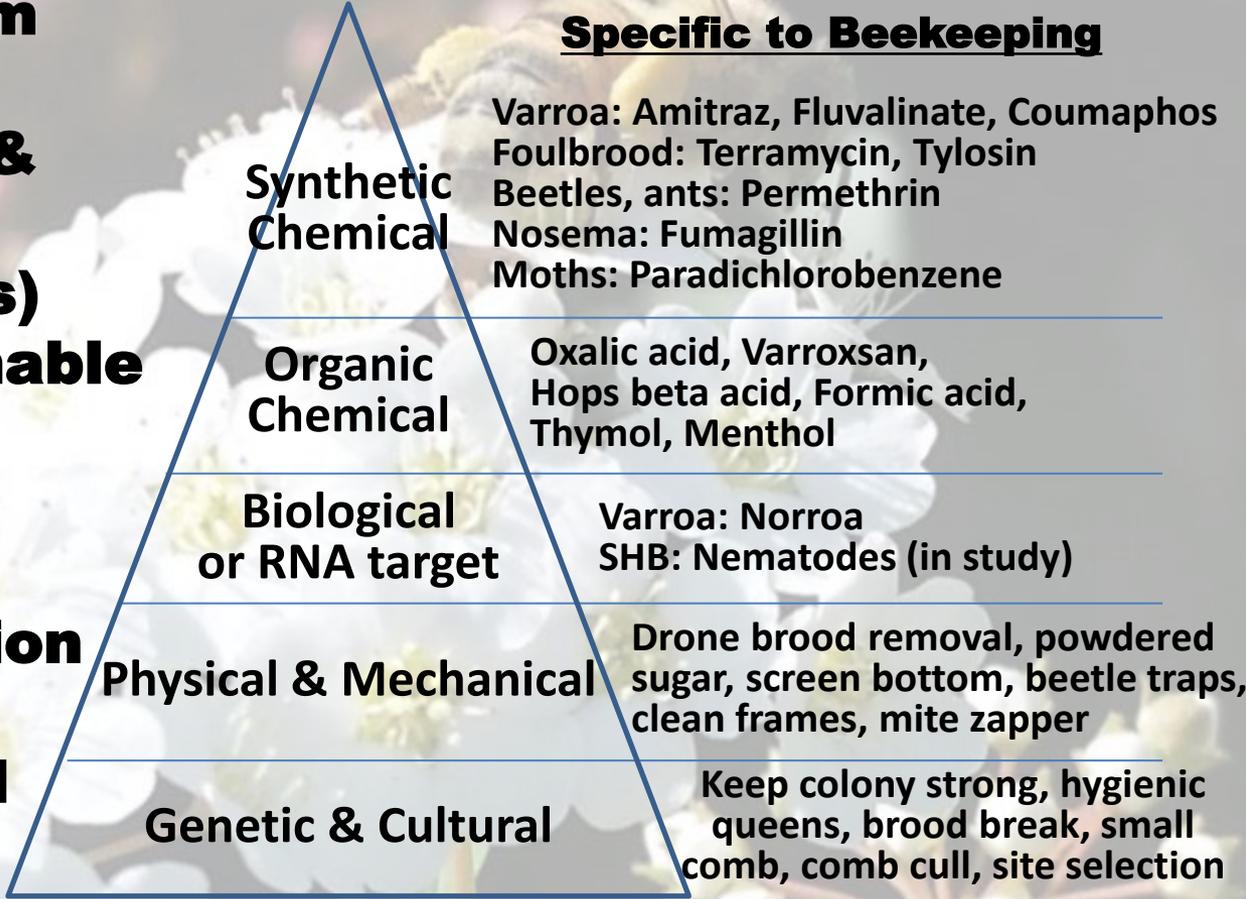
Integrated Pest Management

• Objectives:

- Solve pest problem
- Reduce risks to people, property, & environment (less harmful chemicals)
- Long-term sustainable
- Reduce costs

• Principles:

- Minimal intervention
- Start at bottom & move up if needed
- Monitor & test for effectiveness
- Adapt & adjust

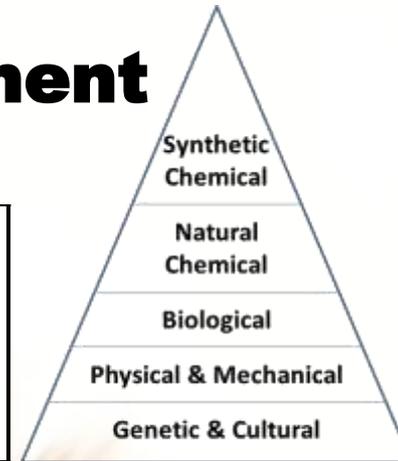


Rotate Methods to Reduce Resistance

When Mite Count is Below 2 or 3%

- **Start low on Integrated Pest Management triangle to keep mite count low**

Treatment	Ess Oil	Org Acid	Synth Chem	Non-Chem	Mite kill	Improved Losses	Residues	Incr	Peak	Decr	Dorm
Drone brood removal				Y		10%	No	H	L	L	
Brood interruption				Y			No				H
Divide colony				Y			No	M	M	M	
Requeen hygienic				Y			No	M	M	M	
Basic Sanitation				Y			No	M		L	
Screen bottom board				Y	<10%	3%	No	L	L	L	L
Powdered sugar				Y	10-30%	?	No	L			



Integrated Pest Management

Key
H = Highly Effective
M = Moderately Effective
L = Least Effective

- **Sanitation: cull old brood comb, space out colonies, sunny area w good drainage, clean tools between colonies, freeze frames**
- **Combine methods for best results**

When Mite Count is Above 2 or 3%

Info compiled from honeybeehealthcoalition.org/Varroa/ 2021

• Move up the Integrated Pest Management triangle

Treatment	Ess Oil	Org Acid	Synth Chem	Non-Chem	Mite kill	Losses	Improved	Residues	Temp, °F	With supers				No Brood				With Brood						
										With supers				No supers				No supers						
										Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm			
Varroxsan oxalic strips		Y			90%	39%	No	Any	Can use any time, with & without supers															
Oxalic dribble		Y			90%	39%	No	Any					Y	M	M	Y	Y	M	M	Y				
Oxalic acid fume (dangers)		Y			90%	39%	No	Any					Y		Y	H	Y	Y	Y	H				
Hops beta acid (Hopguard 2)		Y			85%	0%	No	>50°	M	M	H	H	M	M	H	H	M	M	H	H				
Formic acid (MAQS, Formic Pro)		Y			80%	24%	No	50°-85°	H	H	H	M	H	H	H	M	H	H	H	M				
Thymol (Apiguard, Apilife var)	Y				83%	30%	Some	59°-105°					H	H	H	M	H	H	H	M				
Amitraz (Aivar, Taktic)			Y		95%	41%	Yes	Any					H	H	H		H	H	H					
Fluvalinate, Coumaphos			Y		97%*	7%	Yes						Y		L		Y		L					
Vadescana (norroa)			rna		Any temperature. Advert: 2* more effective than Amitraz at 12-18 wks																			

* For non-resistant mites

- **Brood & broodless are same except for Oxalic Acid**
- **Rotate treatment methods to reduce resistance**
- **Effectiveness changes (resistance, advancements)**
 - **Amitraz was found in early 2025 to be less effective due to over-use, causing mite-resistance**
- **“Norroa” approved in 2025. New method, Targets mite RNA.**
- **Read & follow directions. Required for safety (honey, you, bees)**
- **See MBA resource [How to Help Bees Against Varroa Mites, FAQs](#)**

Key
H = Highly Effective
M = Moderately Effective
L = Least Effective
HBHC Tool says Don't Use
Not Red: HBHC says ok

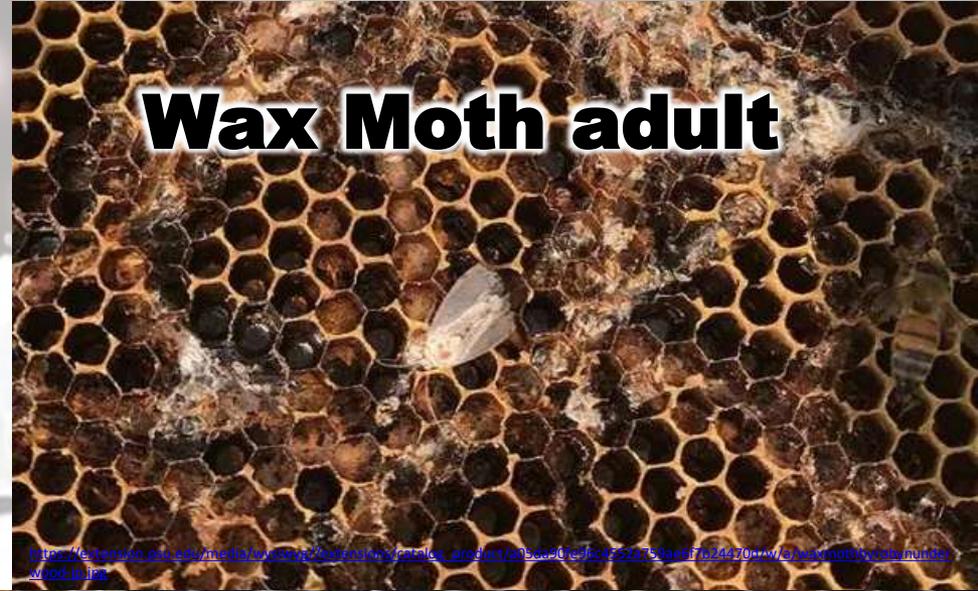


What Other Pests Are Threats?

Small Hive Beetle, SHB, adult



Wax Moth adult



https://extension.psu.edu/media/wysiwyg/extension/pests/caterpillars_products/2006091675c4052a159ae67674c70011/waxmothwomburmerwood.jpg



**Small
Hive
Beetle**

SHB larva



Wax Moth larva



- **Scavengers, invade weak colonies**
- **Keep colony strong. Locate hive in sun.**
- **Keep space consistent w/ bee population**

<https://bee-health.extension.org/managing-small-hive-beetles/>

www.homesweetbees.com/2017/7/20/how-to-save-one-remaining-hive-from-small-hive-beetles

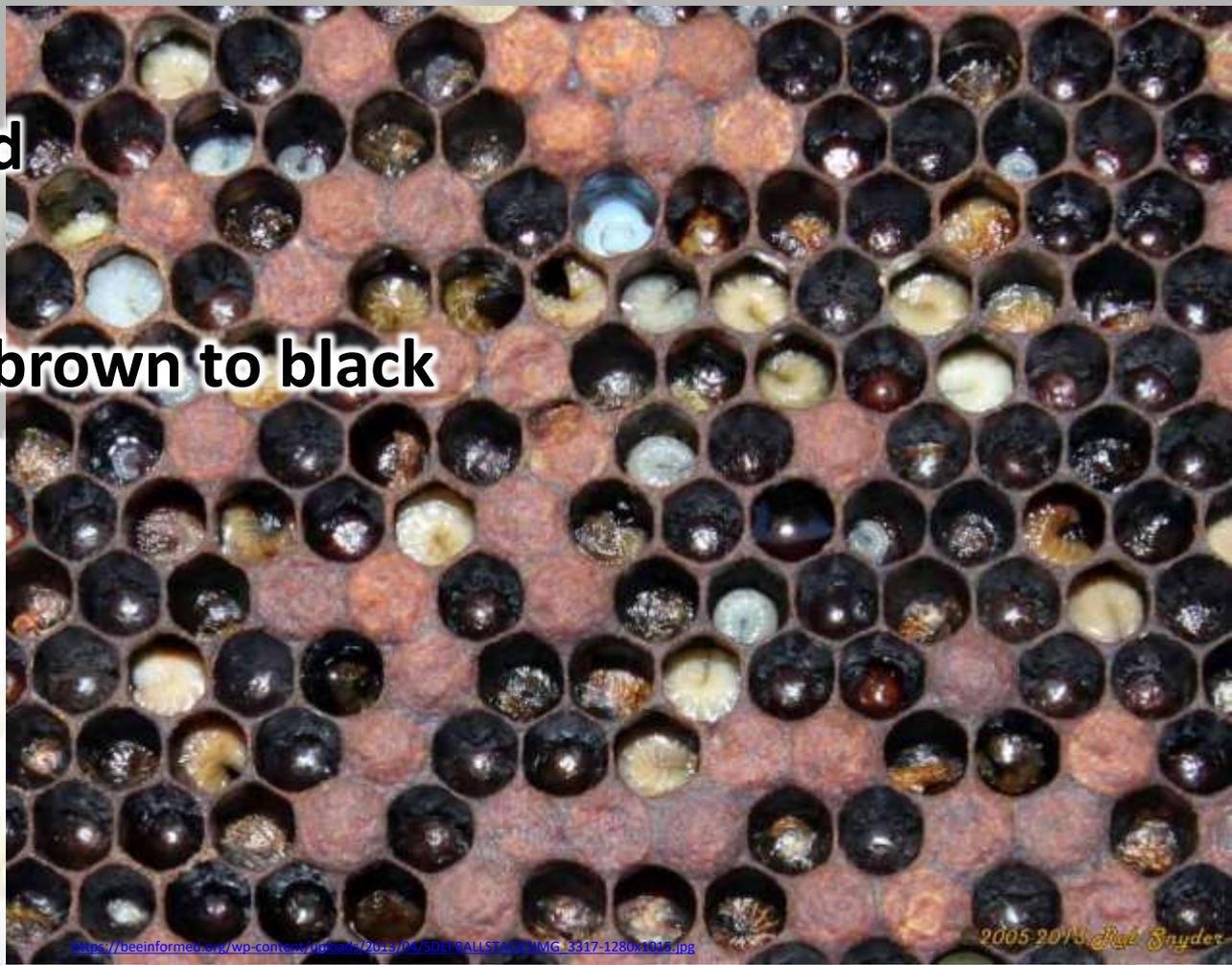
What Diseases Are Threats?

European Foulbrood

Rare

Bacteria, treatable

Larva dull white to brown to black



© 2005-2013, Rob Snyder

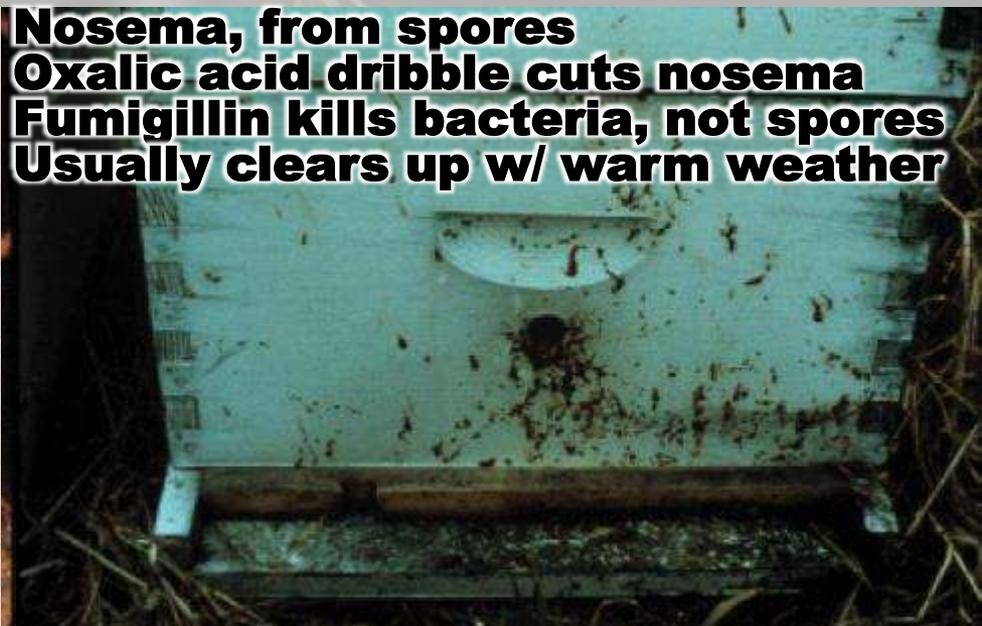
- **Spotty brood pattern can be caused by many things**
 - **Failing queen, Varroa, Hot dry conds, nutrition, Not enough space for nectar & pollen, Brood diseases**
 - **Need to inspect further to determine causes**

What Diseases Are Threats?

Deformed Wing Virus, DWV



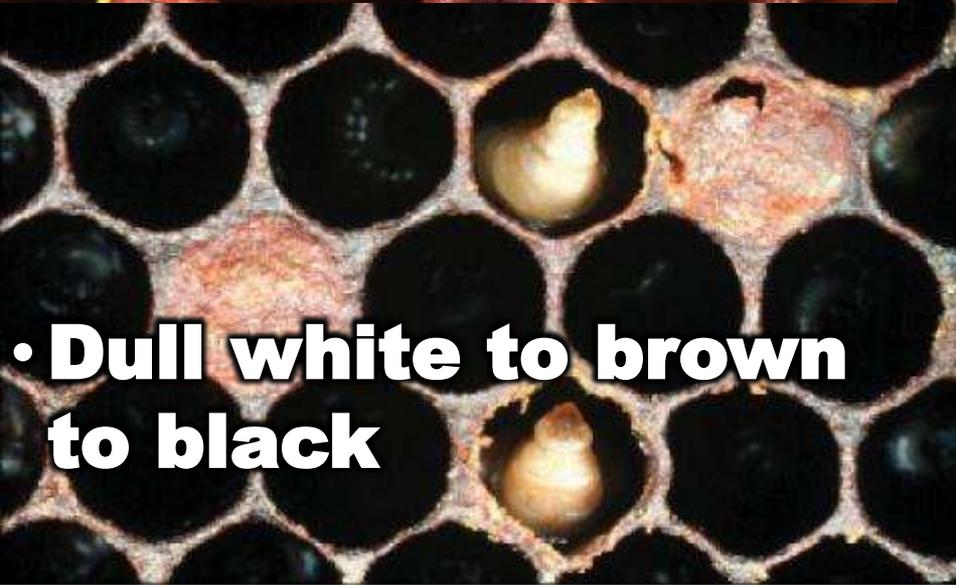
Nosema, from spores
Oxalic acid dribble cuts nosema
Fumigillin kills bacteria, not spores
Usually clears up w/ warm weather



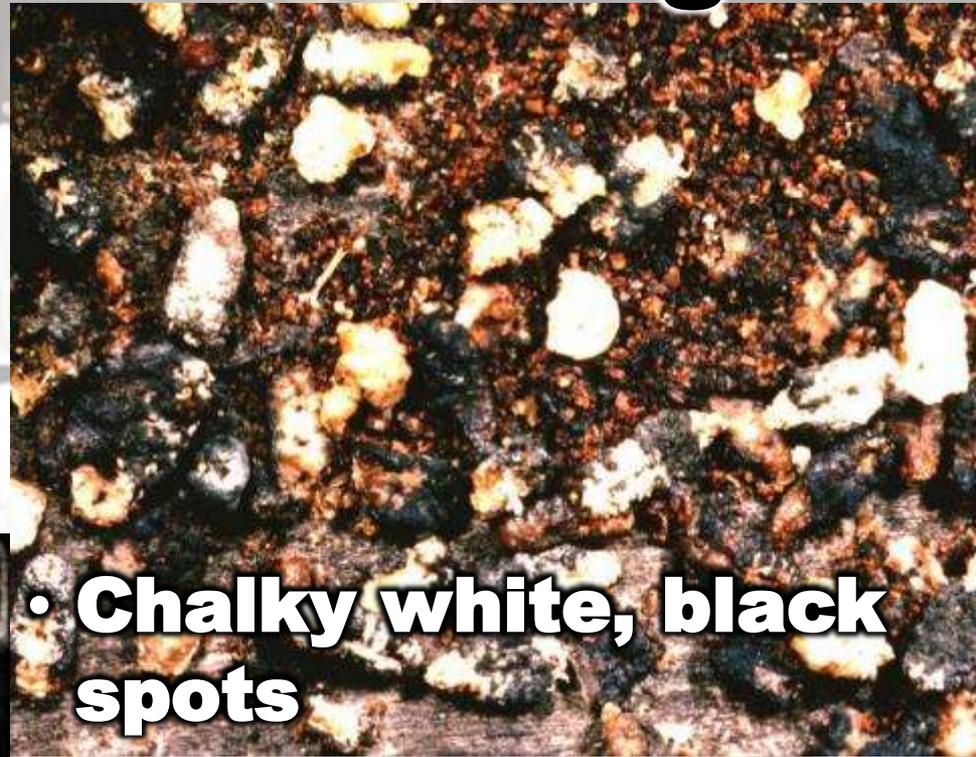
American Foulbrood, Bacteria, very rare, catastrophic



Sacbrood from Virus



Chalkbrood from Fungus



- **Chalky white, black spots**
- **Learn to recognize colonies that are healthy vs unhealthy**
- **Catching early gives more opportunity to fix**



How to Maximize Winter Survival?

- **Same tasks the beekeeper does all year**
 - **Queenright, Nutrition, Pests, Diseases, Housing**
 - **If requeen, do so by ~August, if possible**
 - **If low #s of bees, combine or re-queen**
 - **Have 30-40 lbs of honey by Oct (before day temps < 50° F)**
 - **Check for varroa & other pests, & resolve if needed**
 - **Reduce # boxes in Autumn, consistent with # bees**
- **In North Texas, a healthy hive can survive winter without insulation. More north areas insulate hives.**
- **You can reduce heat loss**
 - **Solid bottom board**
 - **Wind-break (hay bales on north side or underneath, hives on south side of fence or building)**
 - **Box (styro or plastic vs wood)**
- **If you insulate, provide adequate ventilation**



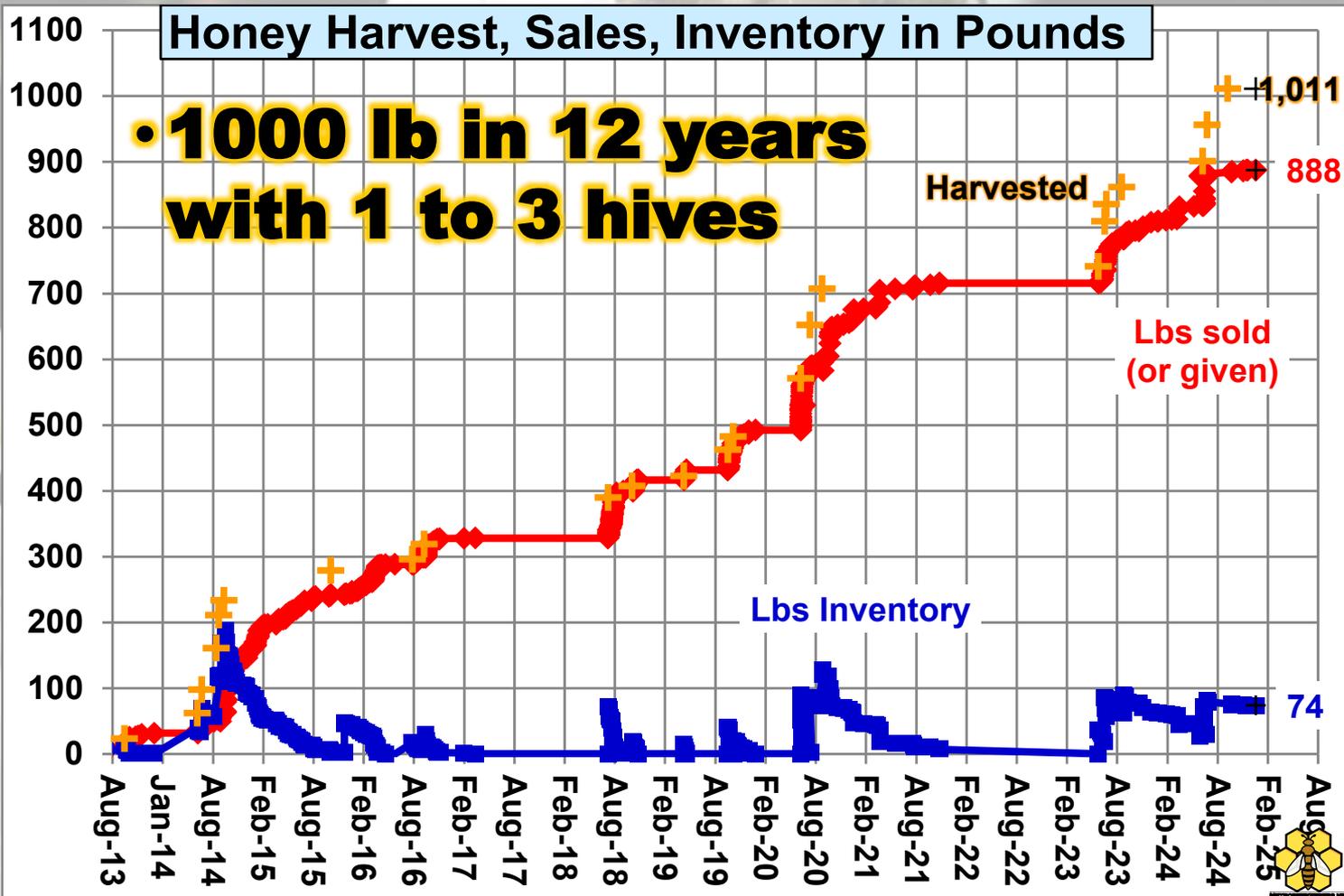
Ft Worth, Jan 2025



How Much Honey Can I Get?

- Depends on # hives, weather, work, (luck?)
- Bad year: None. Good year: 100 lb per hive.
- Our average is 30 lb per hive per year

- Rumors of 200 lb/hive
- Can you do better?
- But don't starve your bees
- They need ~40 lb honey for winter



How Can I Harvest Honey?

Hive Type	Spin in Extractor	Crush & Strain	Comb Honey
Plastic Foundation	Yes ✓	Yes ✓	No ✗
Wax Foundation, With Wires	Spin slow, both sides. Repeat at higher speed. ✓	Yes ✓	Yes, cut around the wires ✓
Wax Foundation, No Wires	No ✗	Yes ✓	Yes ✓
No Foundation, Bees build comb	No ✗	Yes ✓	Yes ✓
Top Bar	No ✗	Yes ✓	Yes ✓
Warre Hive	No ✗	Yes ✓	Yes ✓

- Depends on hive type
- If no extractor, crush comb in bin, put all through filter to drain



Selling Honey in Texas*

Category	Beekeeping Honey Producer	Cottage Food Operator	Com'l
Product	Only 100% pure, raw honey from your apiary, or pure, raw honey blended with your honey. No processing or adding ingredient(s).	May process &/or add non-potentially hazardous food ingredient(s)	Any
Processing	Only strain, dry, cool, warm, blend, package. Not high heat (160°F), pasteurize, whip.	Yes, incl pasteurize, whip.	More rules
Kitchen	Can use various facilities. Not inspected.	Your home, not other bldg. Not inspected.	Com'l
Packaging	Prevent contamination		More
Label	Product: Honey, Pure Honey, Raw Honey, etc. Name & place of business Net weight in both English & metric units (No longer requires label about inspections.)	Name of product, Name & physical address If additives, list ingredients, allergen warning. "This food is made in a home kitchen & is not inspected by the Department of State Health Services or local health department." Rules about size & location of text "honey".	More rules
Label, optional	"Do not feed honey to infants under one year of age."		
Employees?	Anyone associated with the farm/apiary	Employees may produce & sell	Any
Sales limits	In TX. No sales limit.	In TX. < \$50,000 / year.	No limit
Customers	Can sell to consumers & re-sellers in TX.	Sell only directly to consumers in TX.	Any
Location of sale & delivery	In person, phone, mail, online, can mail.	If sold online, must deliver in person. If sold in-person, can be mailed.	Any
Advertising	No restrictions (internet advertising allowed)		More
Licenses	None reqd, but Food Handler recom.	Food Handler's Card (\$7 online)	Biz, Food
Local govt	May not regulate or inspect without a warrant. Must record complaints.		Yes
Taxes	No Texas sales tax on honey (food item). Federal income tax per IRS code.		Sales tax

* This is not legal advice, but a summary of public documents. Sellers are required to adhere to local, state, & federal laws.

• Red text shows the changes in 2020 (law was 2017, but new interpretation comments in 2020, apiary is a farm)

<https://www.dshs.texas.gov/food-manufacturers-wholesalers-warehouses/frequently-asked-questions-food-manufacturers-wholesalers-warehouses>

<https://dshs.texas.gov/foods/faqs.aspx>, <https://www.dshs.texas.gov/foodestablishments/cottagefood/default.aspx>,

<https://texasbeesupply.com/pages/monthly-webinar> Dec 2021

[MBA summary](#)



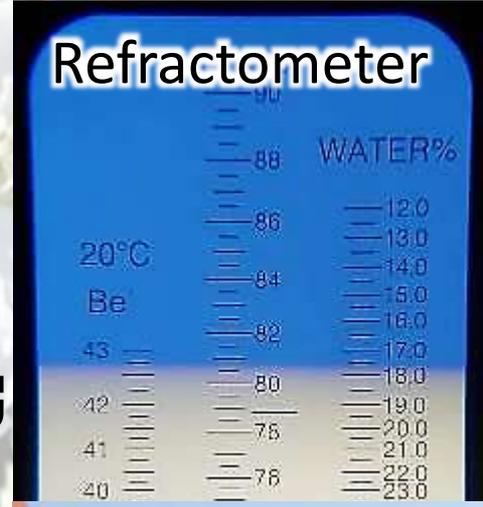
Types of Honey

Type	Description
Pure	Nothing added
Raw	Not cooked, not heated above 160° F.
Unfiltered	Not ultra-filtered or pasteurized. All honey for consumption is strained through a filter to remove bits of wax, etc, but that's not "filtered".
Filtered or pasteurized	Heated & pressed through membranes to remove pollen so the honey will not crystallize, & so honey source can't be identified. The process removes beneficial nutrients the bees added (pollen, enzymes, propolis).
Crystallized	All pure, raw honey will crystallize, ie, grow large crystals. Crystallized honey is real honey & tastes the same, but will not pour, but can be spooned. Some people don't like the granular texture. Crystallization is faster when stored at cooler temperatures or has extra low moisture content. (High moisture honey can spoil, see next page.) Return to liquid by putting honey jar in a bowl of warm water (~100° F) for ~30 minutes. Microwaving would destroy benefits of honey.
Creamed	Smooth honey made into very small crystals, so it still flows or spoons & will not crystallize into semi-solid. Significant effort, premium product.
Whipped	Some people whip honey which adds bubbles, but does not prevent crystallization, & should not be confused with creamed honey

Does Honey Spoil?



- **Honey has been found at 5,500 yrs old**
 - Low moisture, low Ph, stored in cool & dark
- **Honey can spoil if moisture >18%**
 - Honey pulls moisture from the air, grows yeast, ferments
- **Signs of spoiled honey**
 - Mold; Bubbles; Separated layers; Smell (rancid, vinegar); Taste
- **Crystallized honey is not spoiled**
 - Spread w/ knife or spoon, or
 - Warm jar in bowl of ~100°F water



How Do I Melt Wax?

- **Bees eat 5 lb of honey to make 1 lb of wax**
- **Don't use open flame, since wax can ignite**
- **Line crockpot w/ nylon mesh, add comb, water**
- **Heat to about 160° F, Don't overheat, Stir**
- **It will separate to layers: wax, water, debris**
- **Pull the nylon up to remove the debris. Cool.**



Brent's Bees:
Wax Processing



How to Store Frames

- Freeze frames 2 days to kill pests/eggs
- Then store



Bags w/ PDB, seal w/ twist tie



Open air storage



Stack w/ PDB

- Use PDB, para-Dichlorobenzene
- **Don't use moth balls** (naphthalene)
- Before re-use, air-out for 2 days

www.youtube.com/watch?v=c1rS7eAmhivM



Freezer



Top Mistakes in Beekeeping

- **Not learning to recognize Problems due to Skipping Classes, Field trips, & Mtgs; Not Reading Books**
- **Not inspecting Weekly in Spring & Monthly in Winter**
- **Not knowing what to do for various problems**
- **Not acting in time to save the colony**
- **Giving up after losses**

Problems	Bees Die	Bees Leave	Actions Beekeepers Could Take
Varroa	Yes	Yes	Prevention, Inspect, Treat or Help
Starve/Nutrition	Yes	Yes	Leave enough honey after harvest &/or Feed well ahead of when needed
Queen Failure	Yes	Yes	Replace queen Give frame of brood & young eggs
Pests, Diseases	Yes	Yes	Keep colony strong (queen, nutrition, varroa, location)
Swarm		Yes	Give them another box or split
Freeze, Condensation	Yes		Ventilation, Windbreak, Strong Colony, Solid bottom board in winter

Haver or Keeper?



Provide a Box for Shelter

I have a cat

I have bees



<https://www.chewy.com/frisco-outdoor-wooden-cat-house/dp/387230>



A cat has me!

Provide Shelter, Food, Water, Inspect, Meds, & Post Pics



I'm a beekeeper

<https://www.dreamstime.com/2Fw2Fthumbs-dreamstime-com/2Fw2F92Fwoman-feeding-cat-cat-sitting-ground-woman-holds-bowl-food-woman-feeding-cat-336872534-jpg>

Some of Our Favorite Resources

Group	Notes	Link
Metro Beekeepers	Take MBA Class . Attend monthly mtgs, Q&A. Read online Resources	metrobeekeepers.net
The Bee Supply	Monthly webinar, magazine, training, equip, bees	thebeesupply.com/
Honey Bee Suite	Rusty Burlew	www.honeybeesuite.com
Carolina Honeybees	Charlotte Anderson	carolinahoneybees.com
Scientific Beekeeping	Randy Oliver, biologist, does experiments & publishes data, observations, lessons	scientificbeekeeping.com scientificbeekeeping.com/first-year-care-for-your-nuc/
Honey Bee Health Coalition	Developed guide for varroa management & other resources	honeybeehealthcoalition.org
Dadant	Learning center, equipment, bees	https://www.dadant.com
Texas Beekeeping Assoc	Beekeeper news, Club locations & contacts, clinics, convention, journal (past issues free)	texasbeekeepers.org
Bee Culture	Monthly magazine (subscription)	www.beeculture.com
American Bee Journal	Monthly magazine (subscription)	www.dadant.com
Beekeeping for Dummies	Book by Howland Blackiston	
Beekeeper's Handbook	Book by Diana Sammataro, Alphonse Avitabile	
The Backyard Beekeeper	Book by Kim Flottum	
Honeybee Biology and Beekeeping	Book by Dewey M. Carron	

- **Many good resources (& many bad ones, not shown)**
- **Tell us your favorites**



What's A Master Beekeeper?

- **Texas Master Beekeeper Program (TMBP) is a 5-year (min) training & certification program**
- **Goal: Increase health of TX Honey Bee industry**
- **Texas A&M Agrilife Extension Service & Texas Beekeepers Association**

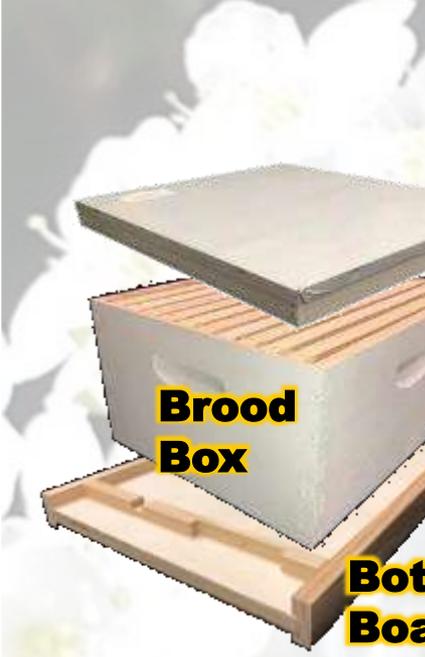
	Apprentice	Advanced	Master
Register	Yes	Yes	Yes
Keep bees	1 year	+1 year	+1 year
Online training		6 modules	Expert in 3 credits in major + 5 credits outside major
Written exam	> 70%	> 70%	> 70%
Practical exam	> 70%	> 70%	
Public service		5 credits	+10 credits

- **Master Craftsman is beyond Master**
- **More info <https://masterbeekeeper.tamu.edu>**



Terms

Abscond	All bees leave, boxes empty
Apiary	Bee yard
<u>Apivar</u>	Synthetic chemical to kill varroa
Bearding	Bees gather on outside of hive
Bee Bread	Pollen, nectar, enzymes, ferments
Bee Brush	Brush to herd bees
Bee Space	1/4" to 3/8" between combs for bees to move & work
Beek	Beekeeper
Beetle Trap	Trap for Small Hive Beetles
Boardman Feeder	External syrup feeder
Bottom Board	Lowest board in Langstroth hive
Brood	Bee eggs, larva, pupa
Brood Box	Box w/ brood. Deep or medium.
<u>Burr comb</u>	Bees built inconvenient comb
CCD	Colony Collapse Disorder
Cell	Wax comb hexagon shape
<u>Chalkbrood</u>	Brood disease from fungus
Checkerboard	Alternate honey frames, not brood
<u>Combine</u>	Combine 2 weak hives into 1
Cross-comb	Bees built comb across frames



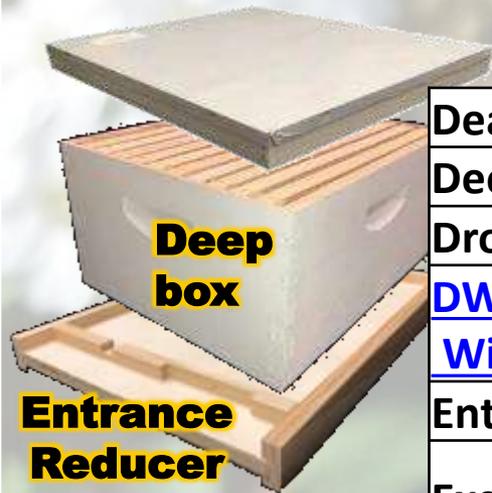
New box	New	Honey								
Orig box	Honey	New								

Checkerboard honey frames



Terms

Dearth	Lack of nectar, pollen, rain, etc
Deep Box	9 5/8", usually used for brood
Drone bee	Male bee
DWV, Deformed Wing Virus	Causes some infected bees to be born with useless wings
Entrance Reducer	Insert to reduce entrance size
Excluder	Grate that queen & drones cannot move through, but workers can
Extractor	Machine to spin honey from frames
Filter	Removes debris from honey
Fondant	Sugar & water to feed cold bees
Food-grade bucket	Used to store & handle honey
Food Handler's License	Texas license, available online with training, small fee
Foulbrood	Brood disease from bacteria
Foundation	Plastic insert in frame
Frame	Used to hold wax comb



Deep box

Entrance Reducer



Entrance Reducer



Filter



**Wood frame
No foundation**



**Wood frame
Plastic foundation**



Deformed Wings



Extractor



Food-Grade Bucket



Terms

J-Tool

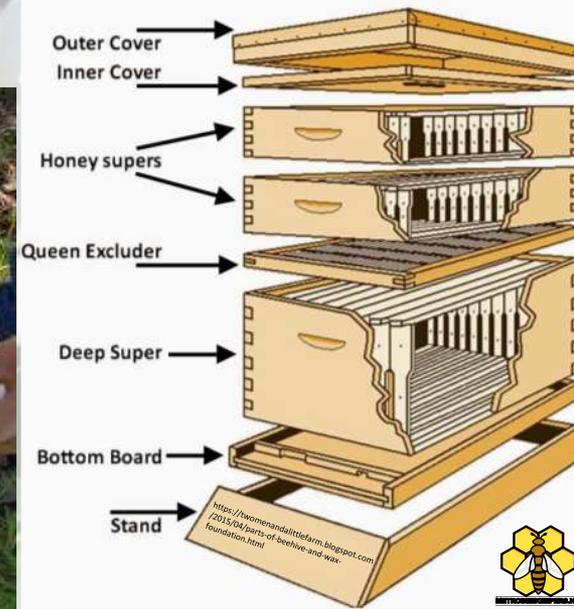


Hive Tool	Tool to pry, scrape, lift
Honey Gate	Valve to control honey pouring
Inner Cover	Prevent top cover from being sealed closed w/ propolis. Insulation.
<u>Inspection</u>	Beekeeper looking at hive for health
<u>IPM</u>	Integrated Pest Management
J-tool	A hive tool w/ hook to lift frames
<u>Langstroth Hive</u>	Standardized hive type
<u>Larva</u>	Bee after egg hatches
MBA	<u>Metro Beekeepers Association</u>
Medium Box	6 5/8", usually used for honey
<u>Moth balls</u>	Naphthalene, do not use! Use PDB.
<u>Mouse guard</u>	Entrance reducer w/ bee-size holes
Nectar Flow	When flowers produce nectar
<u>Nosema</u>	Disease caused by spores
Nuc (Nucleus)	Starter hive w/ queen, 5 frames of bees, honey, nectar
<u>OA</u>	Oxalic Acid, anti-varroa mite
<u>PDB</u>	para-Dichlorobenzene, anti-moth
Pheromone	Bee communication via "smell"

Hive Tool



Langstroth Hive



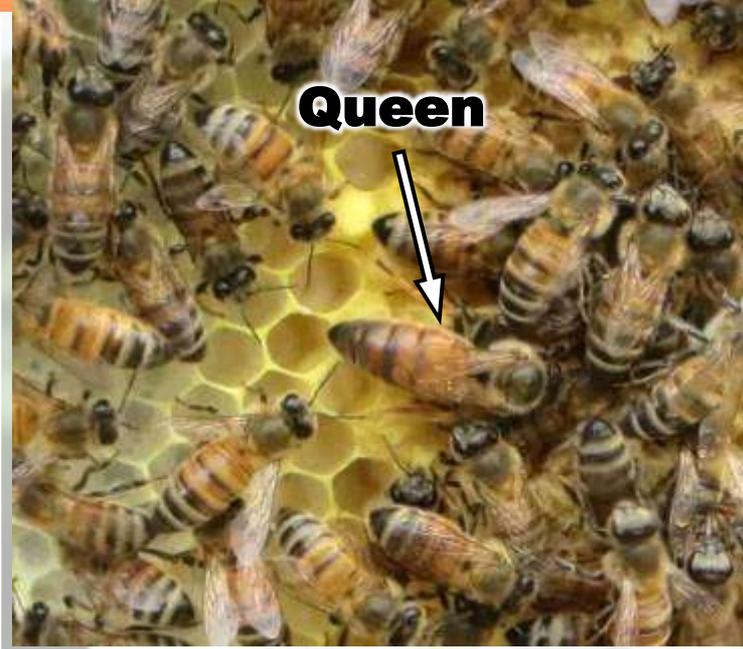
Nuc



Mouse guard



Terms

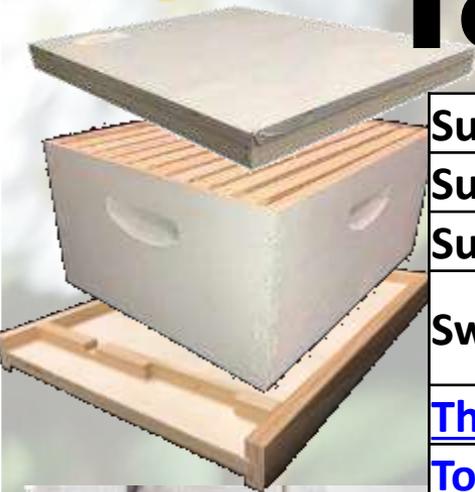


Piping	Sound made by queen
Pollen Substitute	Given to bees in pollen dearth
<u>Propolis</u>	Made by bees from plant sap
Pupa	Bee state after larva before adult
Queen	The bee who can lay fertilized eggs
Queenright	Hive has healthy, productive queen
Robbing	Bees from other hive invade, take honey
Royal Jelly	Fed to larva to grow
<u>Sacbrood</u>	Brood disease caused by virus
Screened bottom board	Screen reduces mites, beetles, & adds ventilation
<u>SHB</u>	Small Hive Beetle
Smoker	Tool to puff smoke onto bees
<u>Split</u>	Divide strong hive into two
<u>Stores</u>	Honey, pollen, bee bread

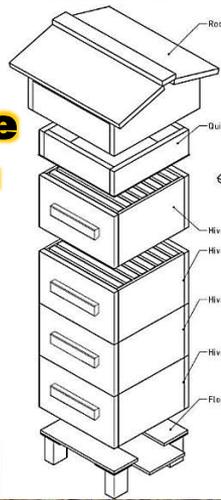
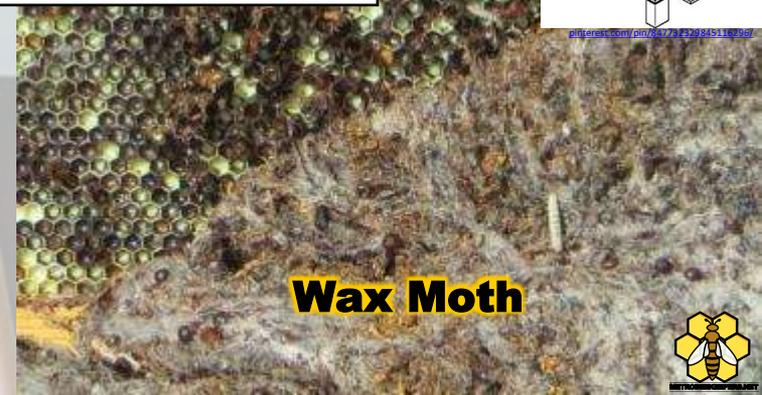


Top Cover

Terms

**Uncapping Tools**

Sugar Brick	Sugar & water to feed cold bees
Sugar Syrup	Sugar & water to feed non-cold bees
Super	Box added for bees to full w/ honey
Swarm	Queen & ~half the bees leave to find new home. Staying bees raise queen.
Thymol	Anti-varroa chem
Top Bar Hive	Horizontal hive type
Top Cover	Lid for hive boxes
Uncapping Tool	Removes wax caps to harvest honey
Varroa Mite	Tiny bug that sucks life & gives viruses
Veil	Head protection
Ventilated Suit	3-layer suit prevents stings, ventilated
Warre Hive	Stacked boxes with top bars
Wax Moth	Scavenger, destroys unprotected comb
Worker bee	Female bee, does <u>all</u> the work!

Sugar Brick**Ventilated Suit****Warre Hive****Top Bar Hive****Worker****Wax Moth**

Happy Beekeeping



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- **We hope you enjoy our FAQs file**
- **Take a class & find out if any of this is right**
- **Corrections & suggestions are welcome**
- **[Contact us](#)**

