

# 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](http://metrobeekeepers.net)  
Corrections & suggestions are welcome. [Contact us](#)

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## 5. Threats to Bees

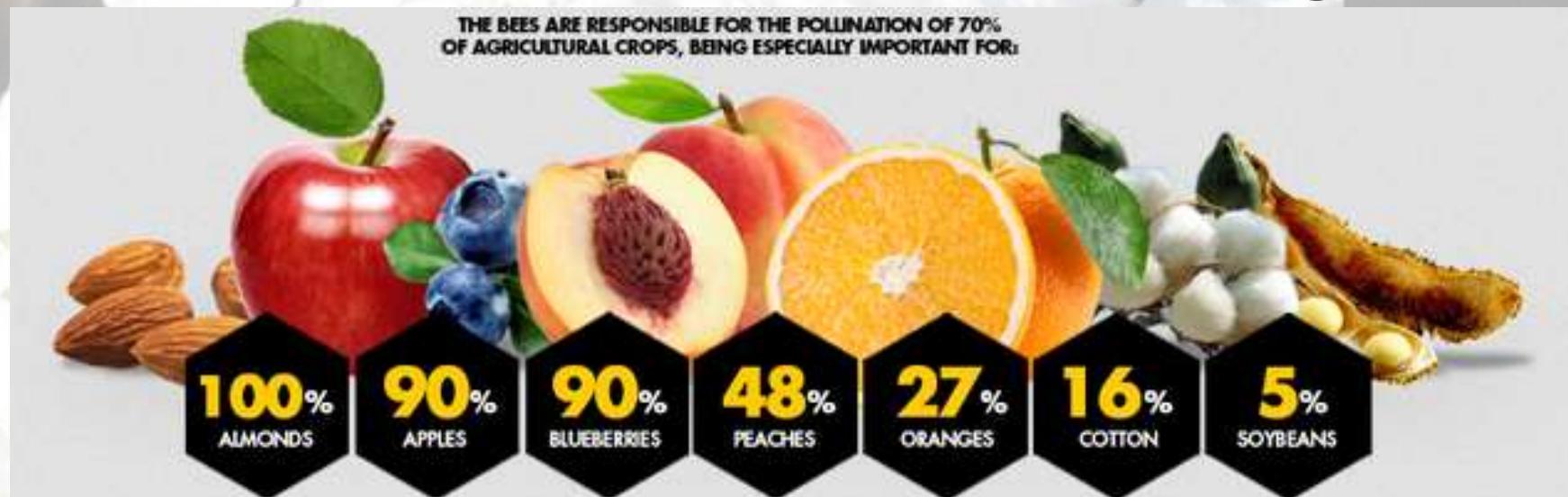
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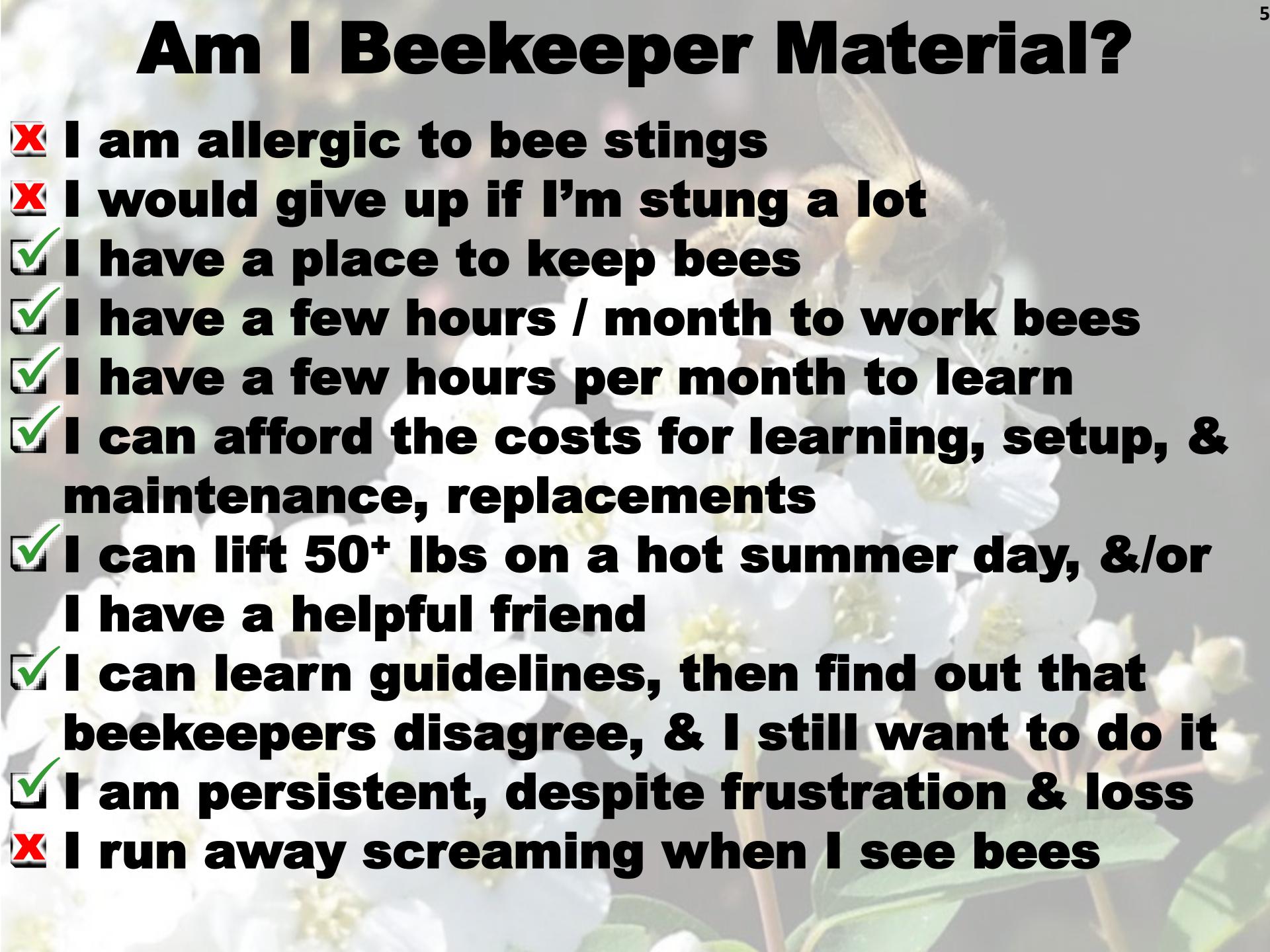
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# Why Would Anyone Keep Bees?

- 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**



# Am I Beekeeper Material?



- I am allergic to bee stings**
- 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**
- I run away screaming when I see bees**

# calvin and hobbes

WATERTON

**Is Calvin a  
Potential  
Beekeeper?**



# Will I Get Stung? Yes.

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



- 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

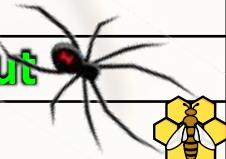
- **Scrape stinger out with fingernail or credit card**
  - Pinching to pull stinger would inject more venom
- **Each sting releases some alarm pheromone**
  - More bees will come there & sting
  - Open the gentle hives first
- **Watch for allergic reaction**
  - Work with a friend
  - If trouble breathing, call 911
  - Experienced beekeepers 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**



<https://bobgunn.com.au/what-you-need-to-know-about-bee-stings/>

# What Could Go Wrong?

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



# 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**

North wind break,  
incl skirt on shed

Workspace in back  
& sides

# Neighborhood Apiary

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



Langstroth  
10 frame

Mouse  
Guard

Stand &  
Bug barrier



Entrance reducer

Facing south or east

Mulch, Grass deterrent



Top Bar

Dry,  
Level

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

Lot size	# hives
< $\frac{1}{4}$ acre	2
$\frac{1}{4}$ to $\frac{1}{2}$	4
$\frac{1}{2}$ 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>

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

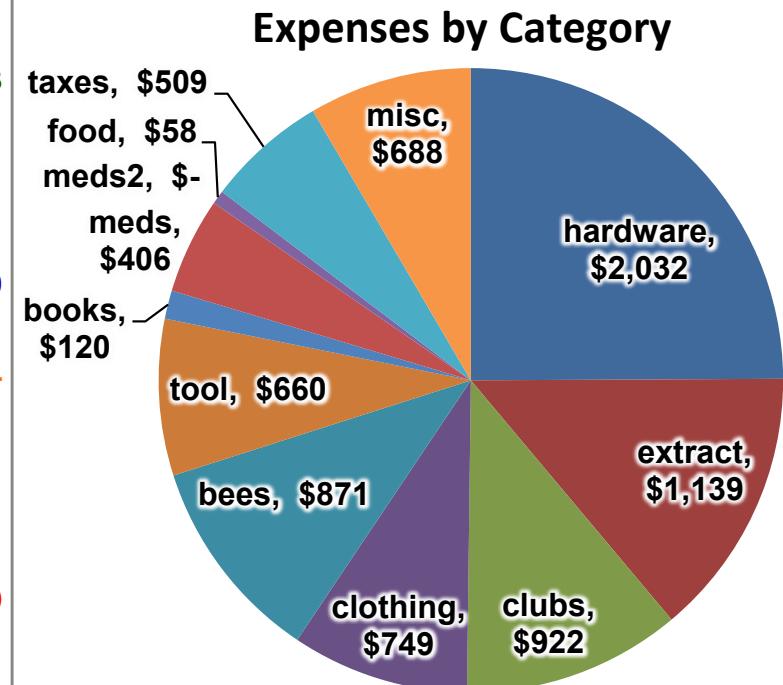
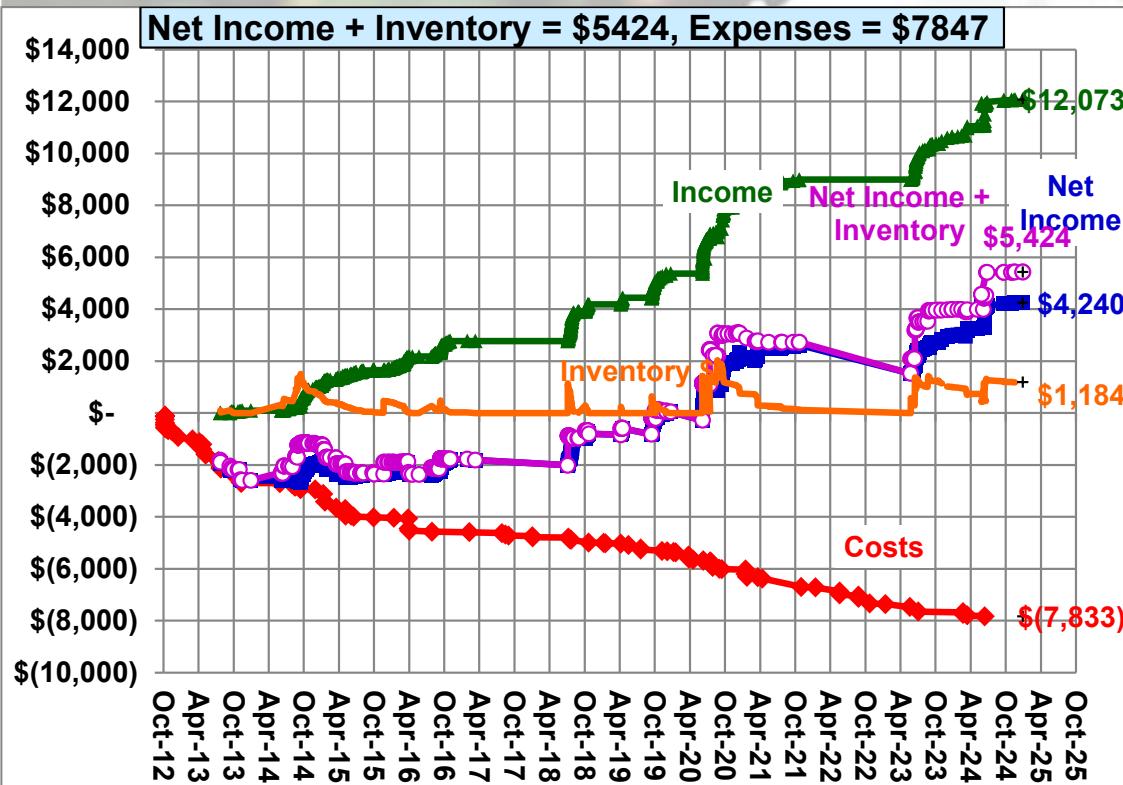
Ordinance 21653

- 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  $\frac{1}{4}$  acre or smaller, four hives on lots larger than  $\frac{1}{4}$  but less than  $\frac{1}{2}$  acre, six hives on lots larger than  $\frac{1}{2}$  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;



# 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, boards, frames	\$37
Deep Hive Box		\$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 2<sup>nd</sup> 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>

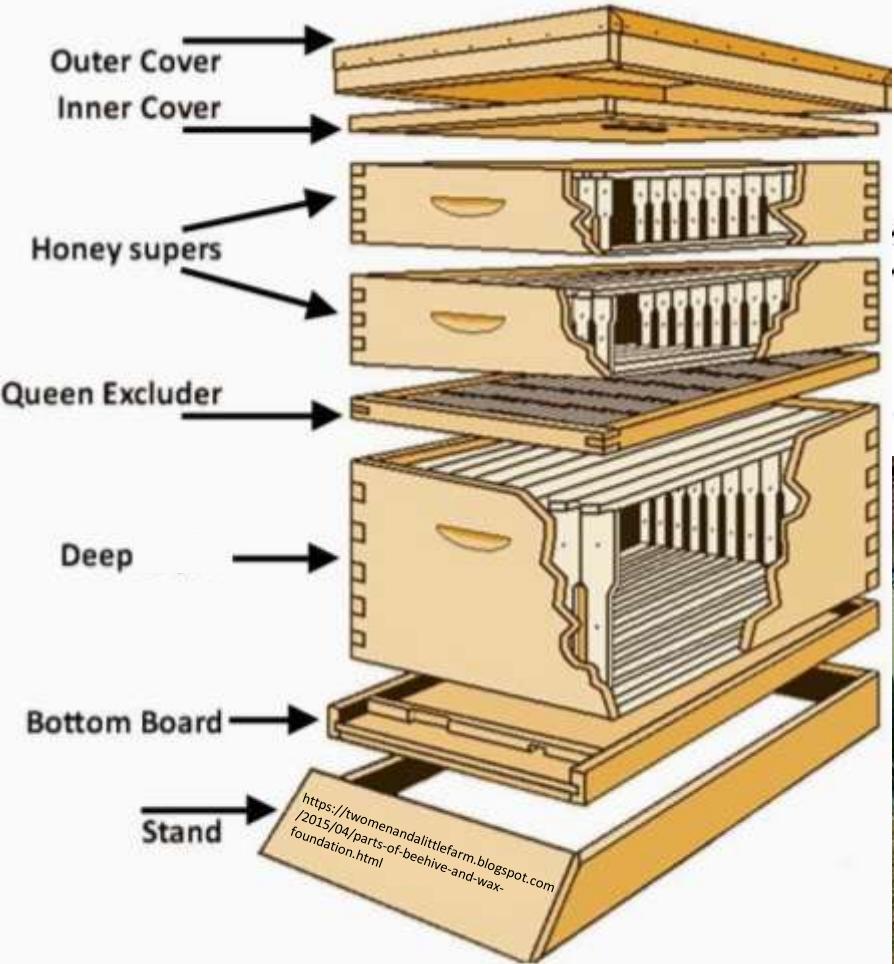


North TX. Each spot was a sting.  
After dealing very defensive colony.  
Similar coverage on veil & suit.  
I was able to keep working.



# What Are the Hive Types?

## Langstroth



## Warre

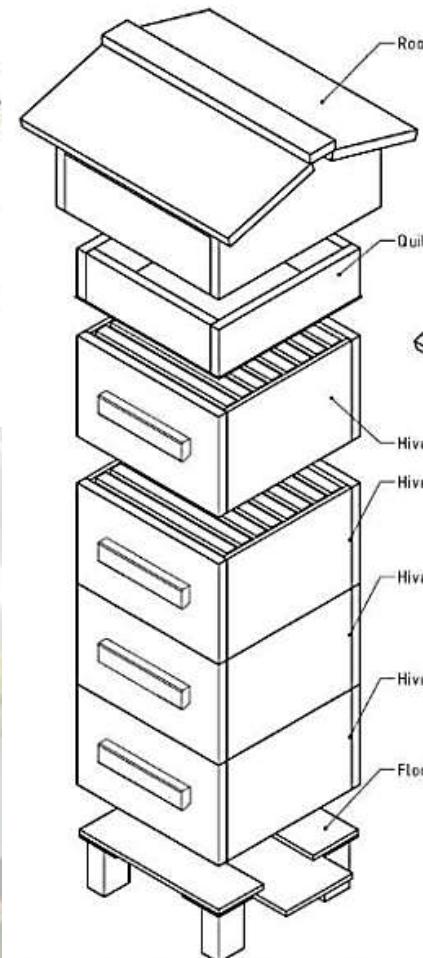


<https://www.biobees.com/images/pc/hive.jpg>

## Lang Long



<https://www.pinterest.com/pin/847732329845116296/>



- **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



<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



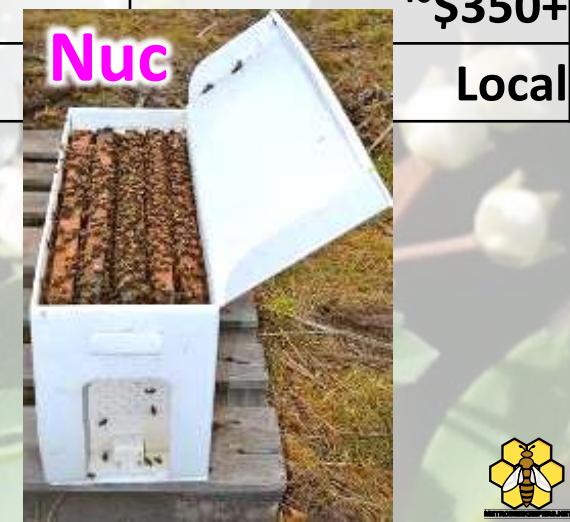
If Two is Better Than One,  
How Much Better is 864?

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# 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 <sup>nd</sup> year	≥ 2 <sup>nd</sup> year	≥ 2 <sup>nd</sup> year	Possibly 1 <sup>st</sup> year
Survival	Variable	Good success	High success	High
Cost	Effort	~\$170	~\$220	~\$350+
Source	Local	Can ship	Local	Local

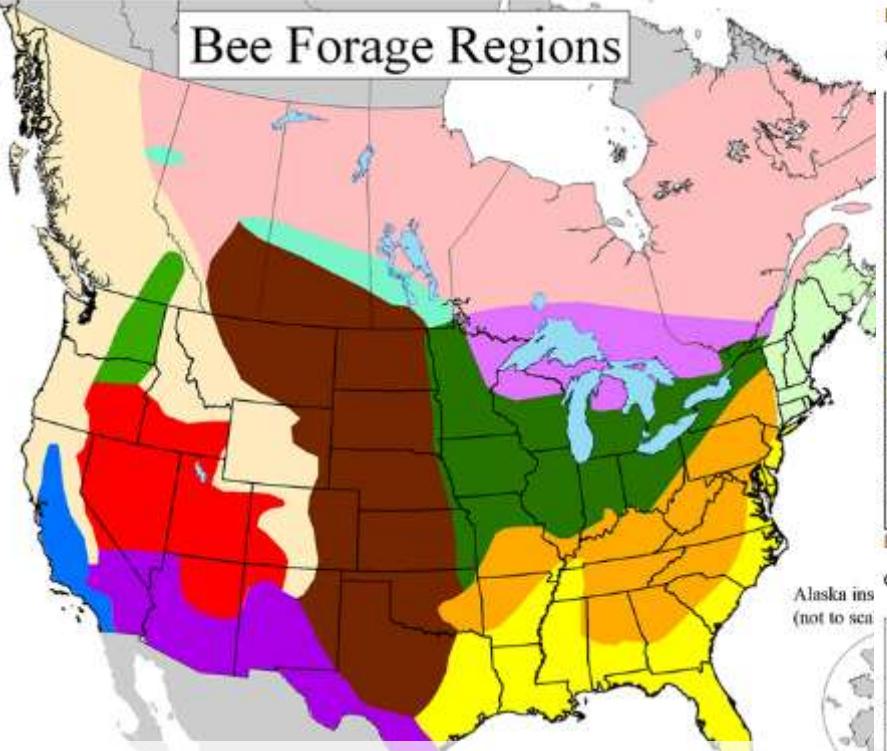


- **Swarm can be captured or bees can move into a swarm-capture box**
- **Or leave a small hole in your eaves (You know that's a joke, right?)**
- **Inspect all colonies & test for mites**



# What are Good Plants for Bees?

## Bee Forage Regions



<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 8 - Great Plains  
 Region 9 - N. Great Lakes & S. Canada  
 Region 10 - Agricultural Interior  
 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

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	Tamaricaceae	<i>Tamarix</i>	Tamarisk, salt cedar, aethel	S	5	9	Y
GOSSY	Malvaceae	<i>Gossypium</i>	Cotton	C	6	10	Y
HELI43	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
POLY4	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

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>	Horsemint, 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, yuccie clover	F	4	7	N
VICIA	Fabaceae	<i>Vicia</i>	Vetch, farc	F	4	9	Y
ACGR	Fabaceae	<i>Acacia greggii</i>	Callclaw, devil's claw, Texas mimosa	S	4	7	N
LIGUS2	Oleaceae	<i>Ligustrum</i>	Pivet, hedge plant	S	4	7	N
PRGLG	Fabaceae	<i>Prosopis glandulosa</i>	Mesquite	S	4	6	N
ILEX	Aquifoliaceae	<i>Ilex</i>	Holly, yaupon	TDB	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>Tridica sebifera</i>	Chinese fallow tree, vegetable fallow	TDB	5	6	Y
GOSSY	Malvaceae	<i>Gossypium</i>	Cotton	C	6	9	N
GUTET	Asteraceae	<i>Gutierrezia texana</i>	Bromweed	F	7	10	N
SOLID	Asteraceae	<i>Salidago</i>	Goldenrod	F	7	11	N
GUSA2	Asteraceae	<i>Gutierrezia sarothrae</i>	Matchweed, snakeweed	F	8	10	N

RETURN to map

• 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

Plant Type

Light Requirement

All

Water Demand

Landscape Use

Ornamental Color

All

Native or Adapted

Wildlife Value

Season

All

Plant Form

Plant Spread (ft.)

to

Plant Height (ft.)

Any

to

Any

Deciduous or  
Evergreen

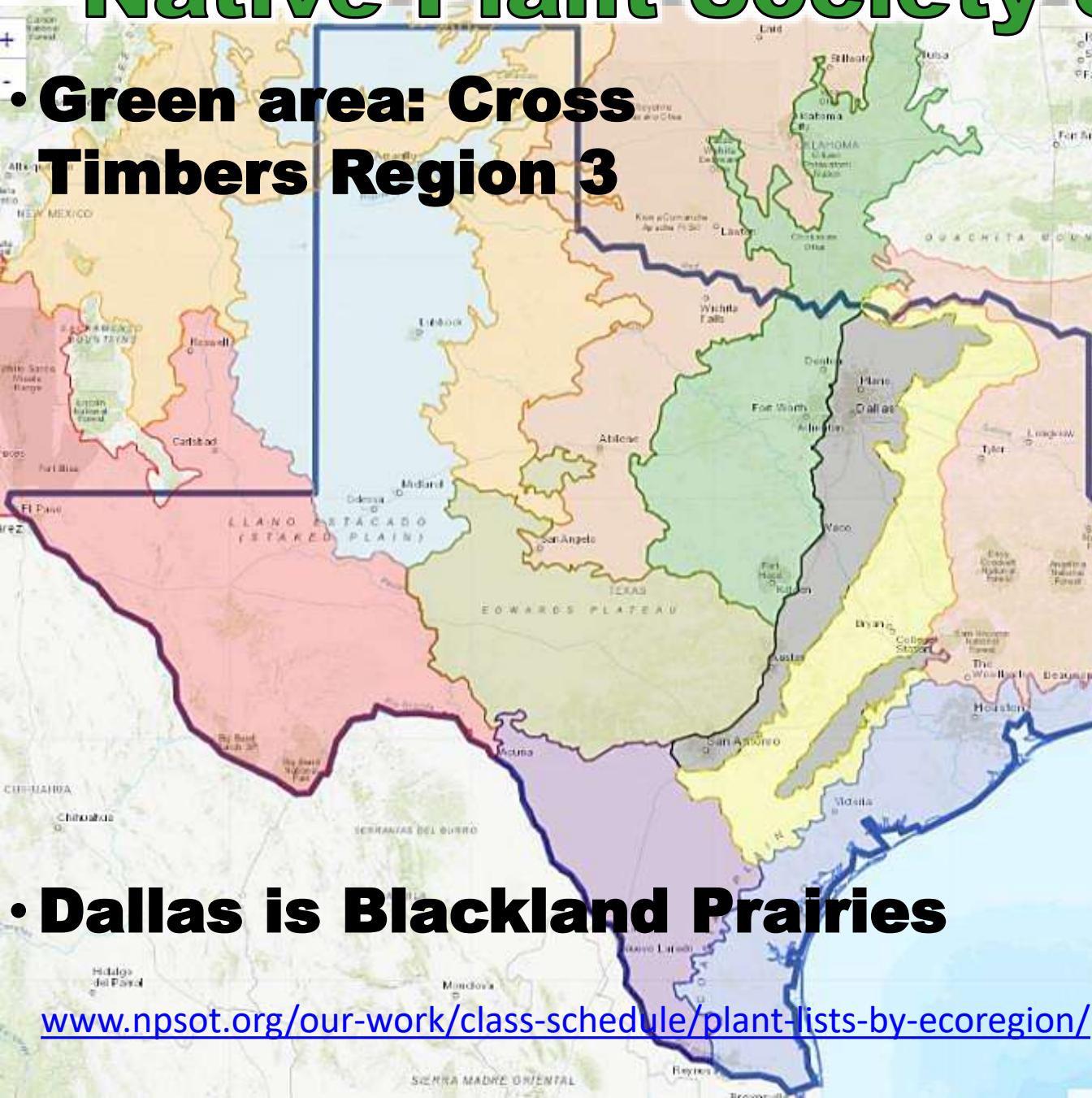
- **Wildlife options: Bees, Birds, Hummingbirds, Butterflies, Mammals**

Search Plants

Reset

# Native Plant Society of Texas

- **Green area: Cross Timbers Region 3**



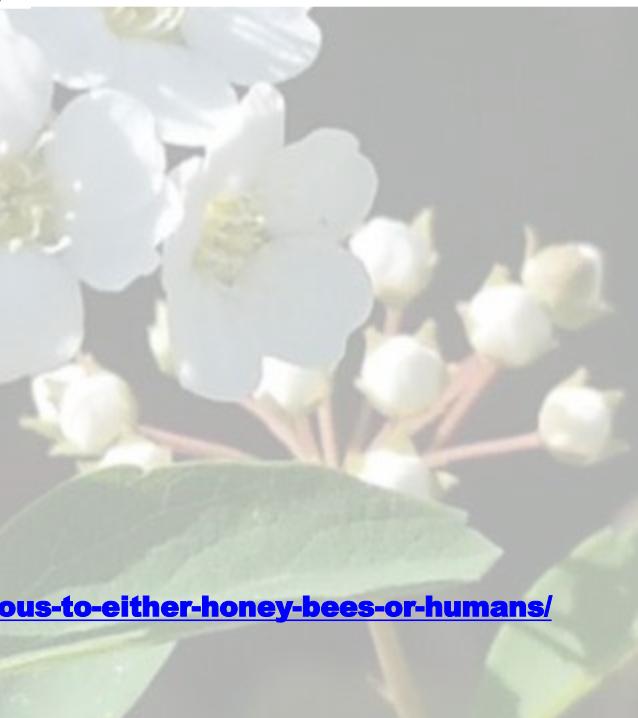
# •39 pages of native plants

# • Dallas is Blackland Prairies

[www.npsot.org/our-work/class-schedule/plant-lists-by-ecoregion/](http://www.npsot.org/our-work/class-schedule/plant-lists-by-ecoregion/)



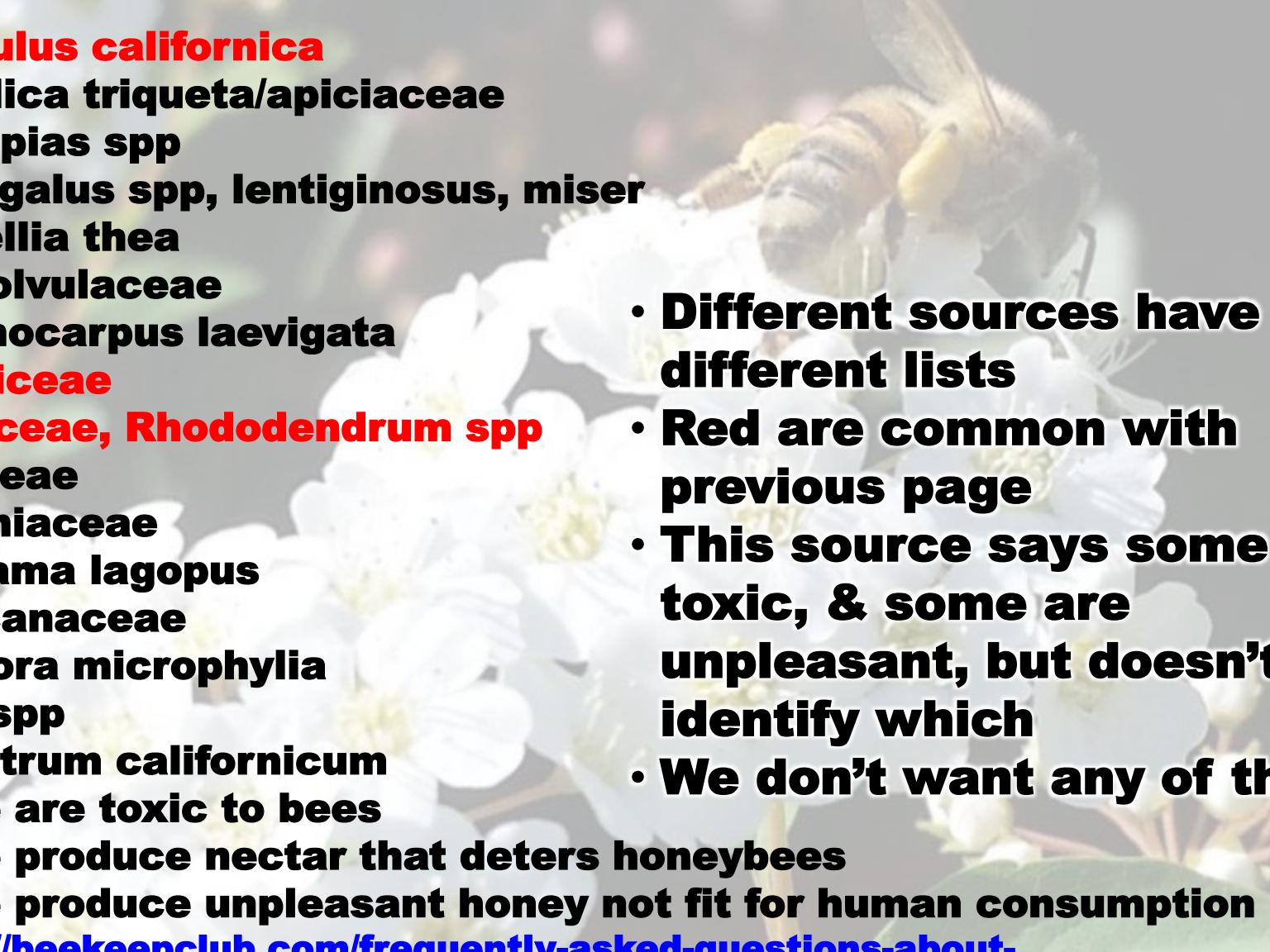
# What Plants Are Toxic to Bees?



# What Plants Are Toxic to Bees?

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- **Aesculus californica**
- **Angelica triqueta/apiciaceae**
- **Asclepias spp**
- **Astragalus spp, lentiginosus, miser**
- **Camellia thea**
- **Convolvulaceae**
- **Corynocarpus laevigata**
- **Cyrillaceae**
- **Ericaceae, Rhododendrum spp**
- **Liliaceae**
- **Loganiaceae**
- **Ochrama lagopus**
- **Solacanaceae**
- **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\*\*](https://beekeepclub.com/frequently-asked-questions-about-beekeeping/#question-14—are-there-some-poisonous-flowers-to-honeybees)

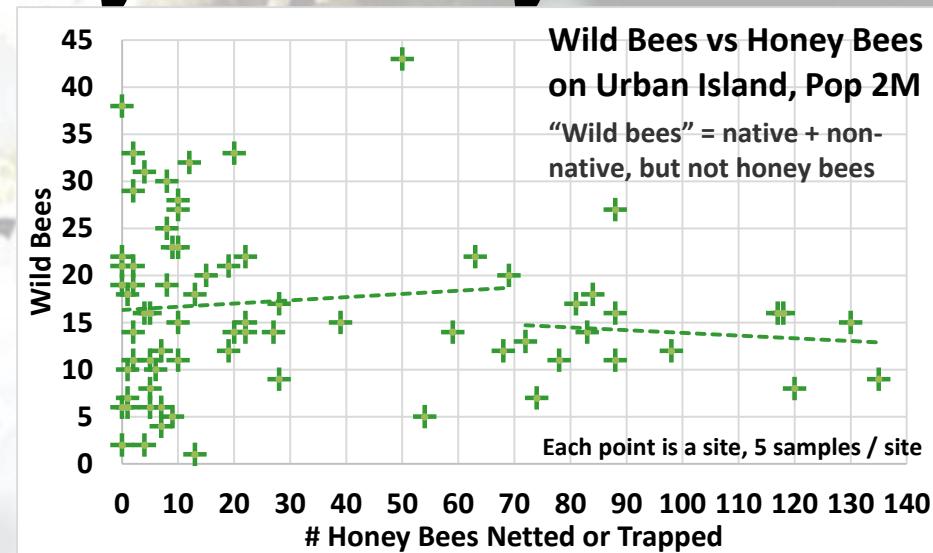


- **Different sources have different lists**
- **Red are common with previous page**
- **This source says some are toxic, & some are unpleasant, but doesn't identify which**
- **We don't want any of them**



# 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](https://pubmed.ncbi.nlm.nih.gov/36755869)



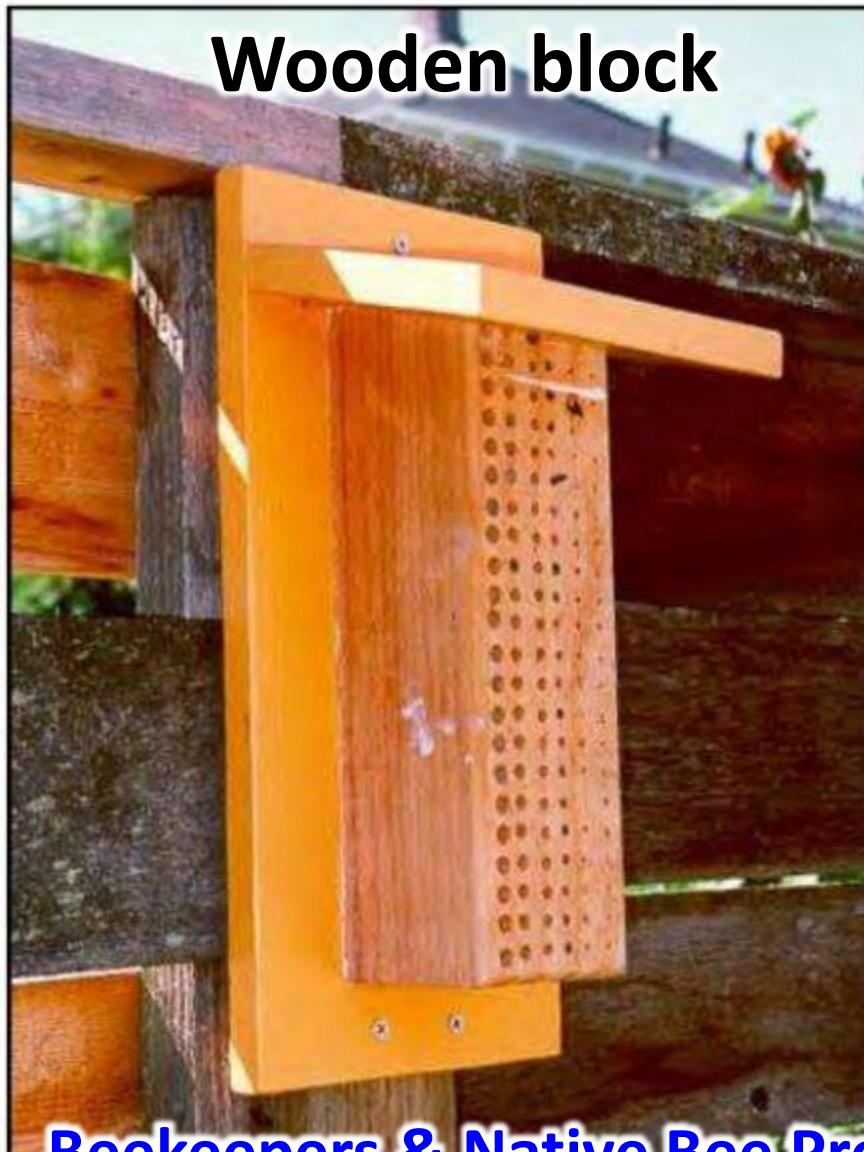
# Do Honey Bees Compete With Native Pollinators?

- **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
<b>Plant pollinator-friendly plants</b>	✓	✓
<b>Grow flowers all year</b>	✓	✓
<b>Provide a water source</b>	✓	✓
<b>Minimize use of insecticides</b>	✓	✓
<b>Minimize use of herbicides</b>	✓	✓
<b>Provide shelters</b>	✓	✓

# Beeks Can Provide Bee Nests

Wooden block



Bamboo bundle



Bumble Bee Box

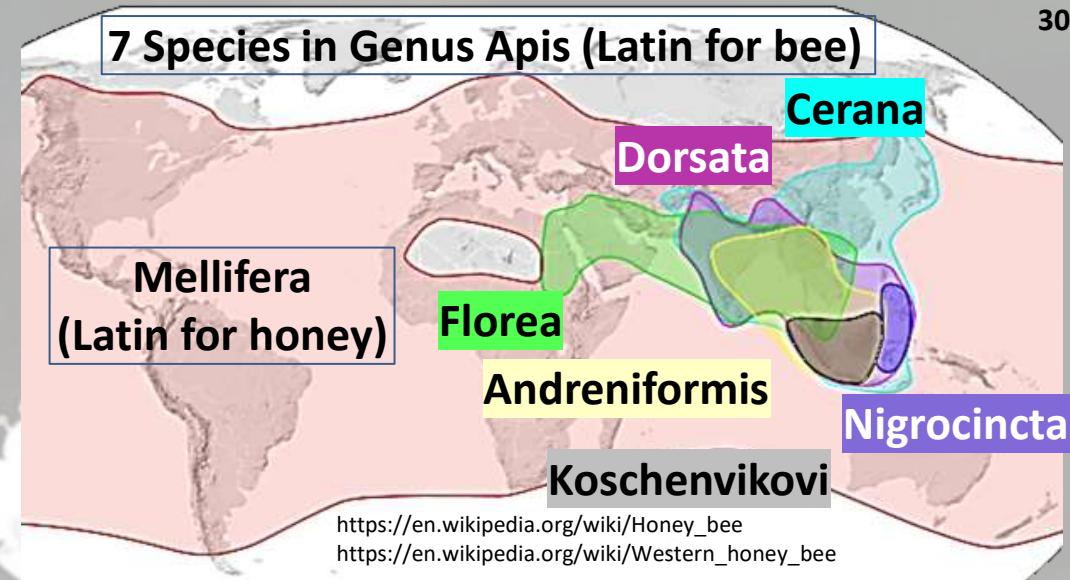


**Beekeepers & Native Bee Protectors can increase collaboration**



# Honey Bees

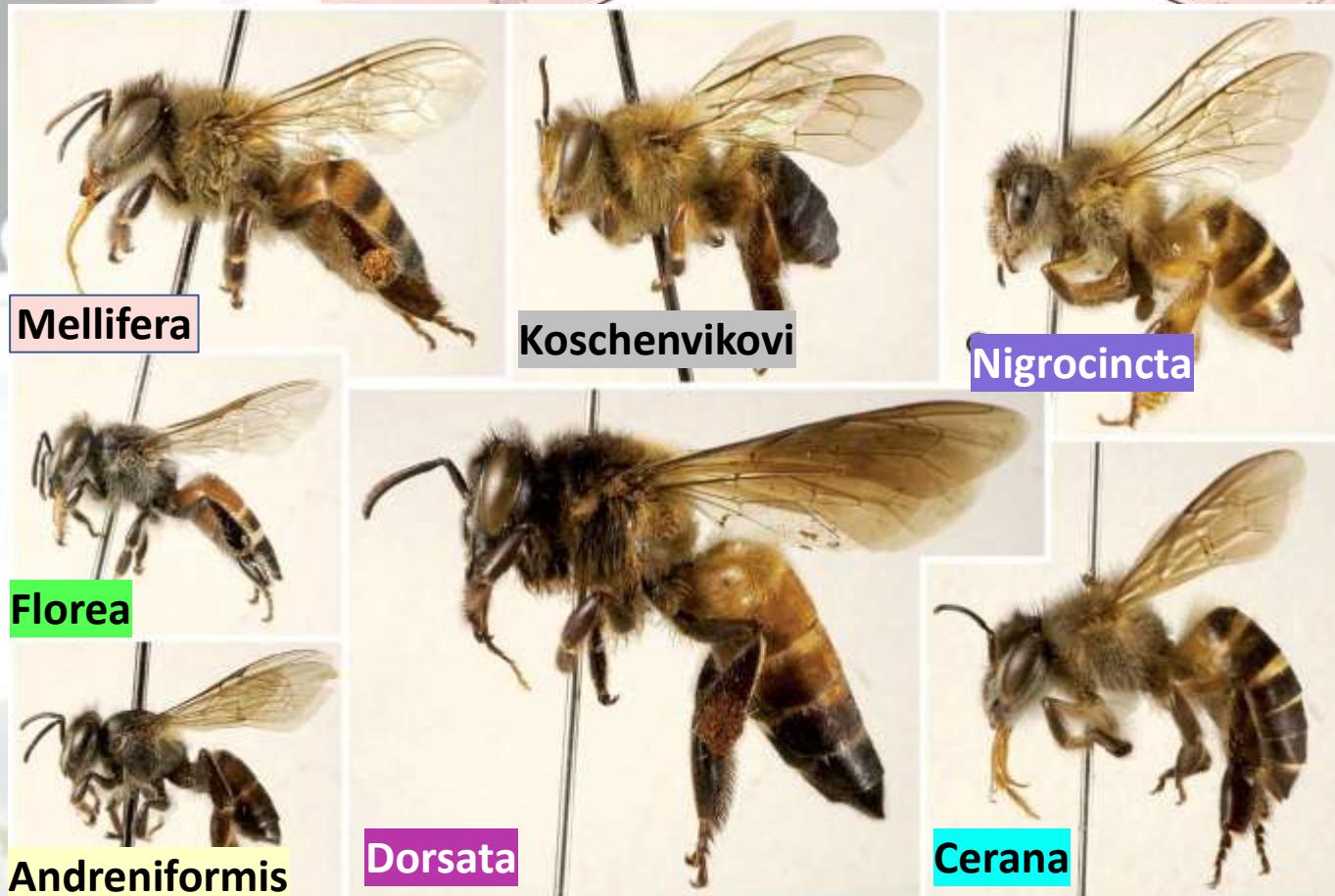
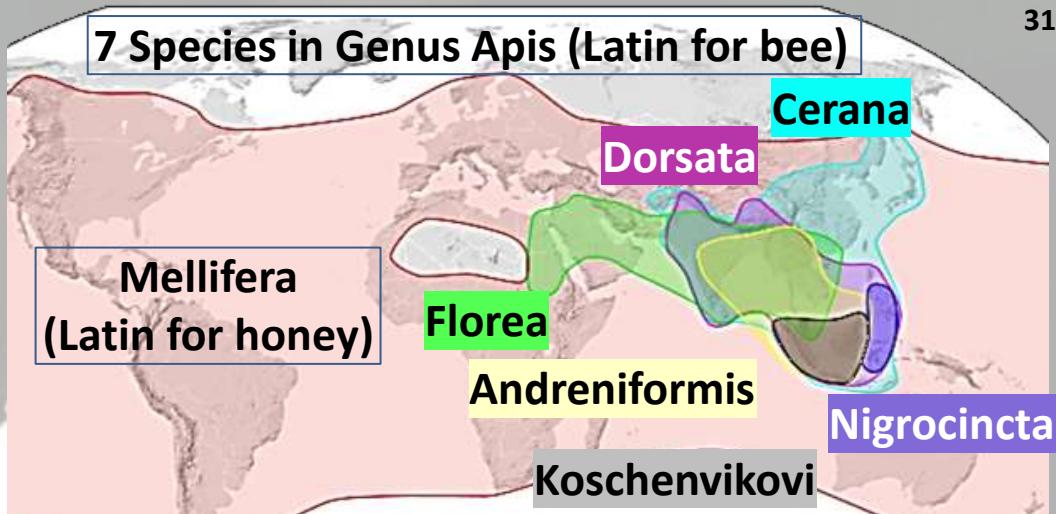
- 7 honey bee species in genus *Apis* →
- 31 *Mellifera* subspecies
- ~10 types of European honey bee
- Inter-breeding changes traits, incl w African



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

# 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



# European Honey Bee (*Apis Mellifera*)



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



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



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

# Bees, Wasps, Hornets



## Honey Bee



*Vespa crabro*



*Vespa crabro*  
European Hornet



*Vespa crabro*  
European Hornet



*Sphex ichneumoneus*



*Sphex ichneumoneus*  
Great Golden Digger Wasp



*Cimbex americana*  
Elm Sawfly



*Vespa vulgaris*  
European Wasp



*Vespa squamosa*  
Southern Yellowjacket Wasp



*Vespa pensylvanica*  
Western Yellowjacket Wasp



*Vespa 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



*Sphecius speciosus*  
Cicada Killer



*Sphecius convallis*  
Pacific Cicada Killer



*Sphecius grandis*  
Western Cicada Killer



*Vespa mandarinia*  
Asian Giant Hornet



*Vespa mandarinia*  
Asian Giant Hornet



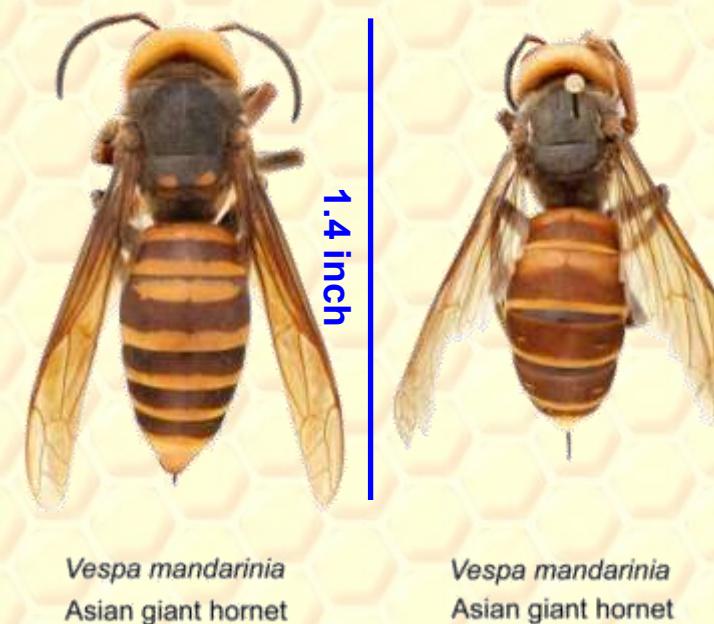
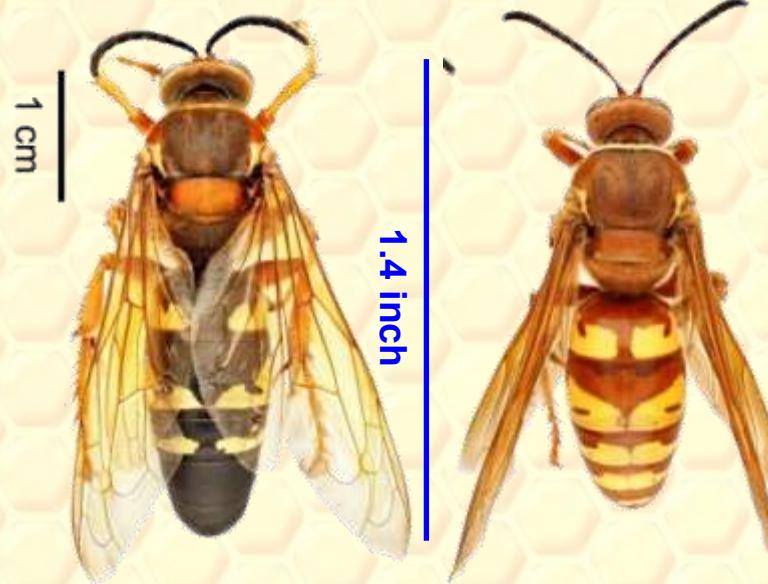
*Tremex columba*  
Pigeon Horntail

1 cm

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



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



# How Long Do Bees Live?

35

- **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/](http://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**

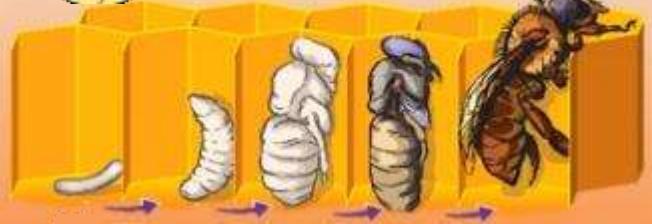


[honeybeesuite.com/diaphanous-wings-they-soar/](http://honeybeesuite.com/diaphanous-wings-they-soar/)

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](http://woodsbeeco.com) <https://youtu.be/SoF6N7G7Af8>



**\*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/](http://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**

## Beekeeper's Inspection Checklist



### 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.)

Inspection Checklist

# 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

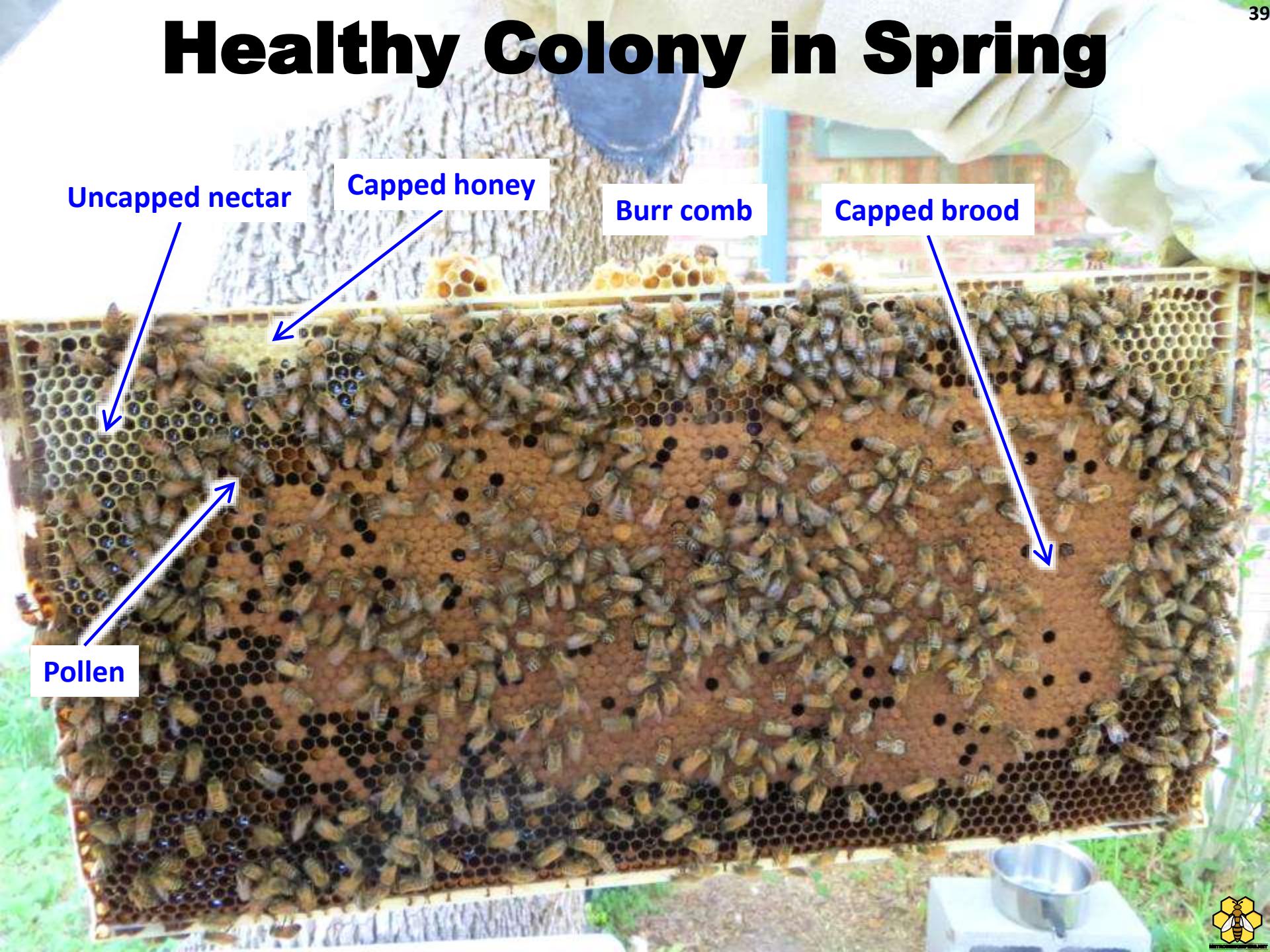
Inspection Checklist, Outside	Inspection Checklist, Inside	Inspection Checklist
<ul style="list-style-type: none"> <li>• Be ready for contingencies (clothing, boxes, frames, buckets, pollen sub, nectar sub)</li> <li>• # of bees coming &amp; going</li> <li>• Crowded entrance</li> <li>• Fighting or robbing</li> <li>• Pollen going in</li> <li>• Water source</li> <li>• Sounds of bees</li> <li>• Spotting</li> <li>• Bees crawling on ground</li> <li>• Dead bees on ground</li> <li>• Equipment (weathering)</li> <li>• Any neighbor issues</li> <li>• Tall grass around hives (ant &amp; pest bridges)</li> <li>• Sun/shade level</li> </ul> 	<ul style="list-style-type: none"> <li>• Smoke before opening</li> <li>• Temperament of bees</li> <li>• Pests (SHB, moths, etc)</li> <li>• # of bees on frames</li> <li>• # of frames with bees</li> <li>• If frames full, add box</li> <li>• If not enough bees to defend space, reduce a box or combine</li> <li>• Queen health           <ul style="list-style-type: none"> <li>– Brood pattern</li> <li>– Queen cups (open, no larvae)</li> <li>– Queen cells (larvae or closed with pupa)</li> <li>– Supercedure cells (on frame sides)</li> <li>– Queen sighting</li> <li>– Stores (honey, pollen)</li> </ul> </li> </ul> 	<p><b>Inspection Checklist</b></p> <ul style="list-style-type: none"> <li>• Mite Count           <ul style="list-style-type: none"> <li>– Sugar roll, alcohol, sticky board</li> <li>– Need treatment?</li> <li>– See <a href="#">Varroa Mite</a></li> </ul> </li> <li>• After inspections           <ul style="list-style-type: none"> <li>– Place orders ahead of time (bees, queens, jars, labels, equipment, etc)</li> <li>– Equipment for supering, harvesting</li> <li>– Record keeping</li> <li>– Learn more: Attend Bee Club, books, web, etc.</li> </ul> </li> </ul> 

# Inspections & Actions by Season

	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 &lt; 2%.</u> <u>When mites &gt; 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 bees intervene less (don't feed, no entrance reducer)
- You get to choose how much you do to help them survive

# Healthy Colony in Spring



# How Can I Find the Queen?



41  
**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 2<sup>nd</sup> frame sideways, away from 3<sup>rd</sup> 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)



# 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?

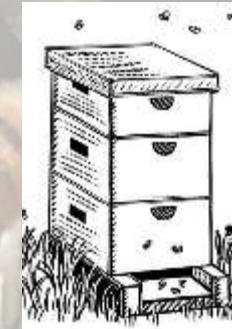
- If frames are ~70% full & growing, add a box
  - Or bees may swarm
  - Consider checkerboarding frames of honey →
- If frames are empty & bee population is declining, remove a box
  - Or hive beetles & wax moths will grow
  - Bee population determines how much space they can defend from pests
  - Do 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](http://carolinahoneybees.com/how-to-split-a-beehive) [www.honeybeesuite.com/splits-2](http://www.honeybeesuite.com/splits-2)



Start with only 1  
deep each

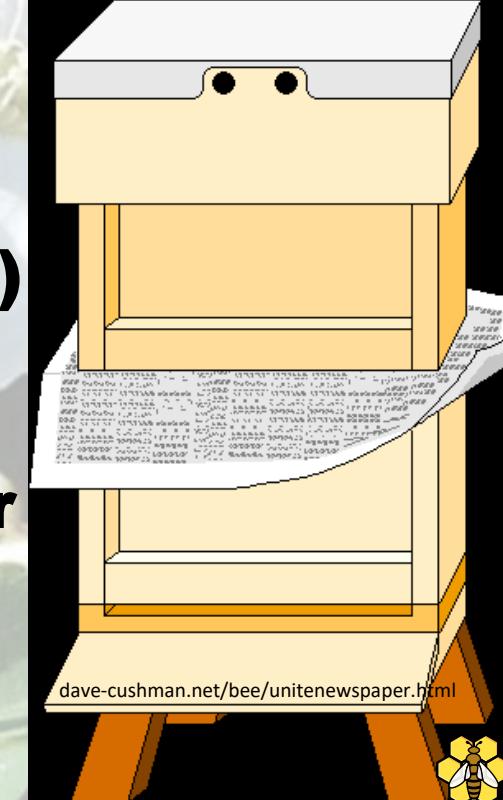


<https://i.pinimg.com/736x/af/b9/de/afb9de21f28a5a8b635e931a314e81c5--bee-clipart-bee-drawing.jpg>



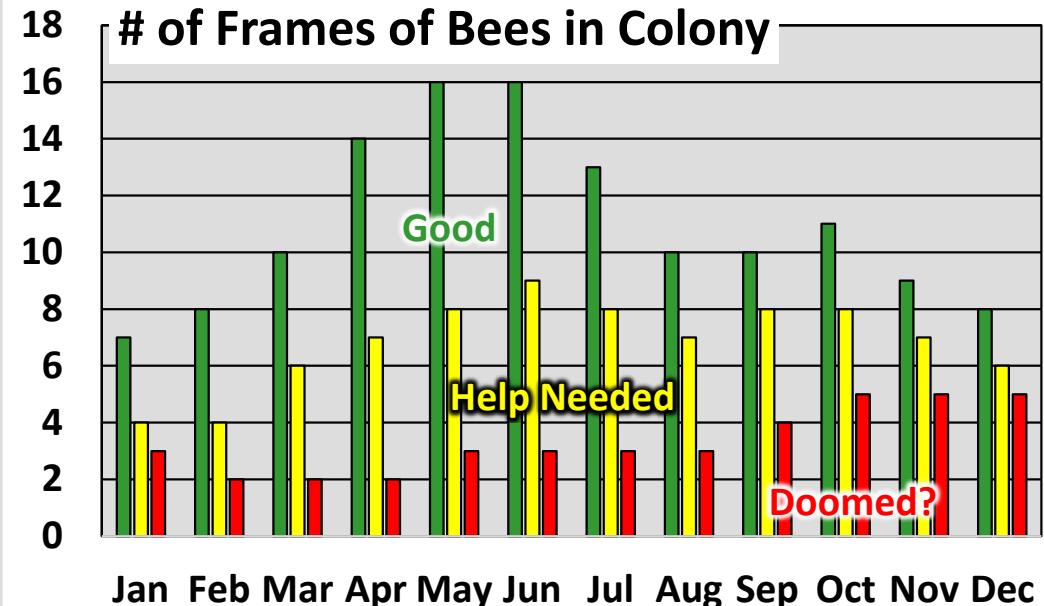
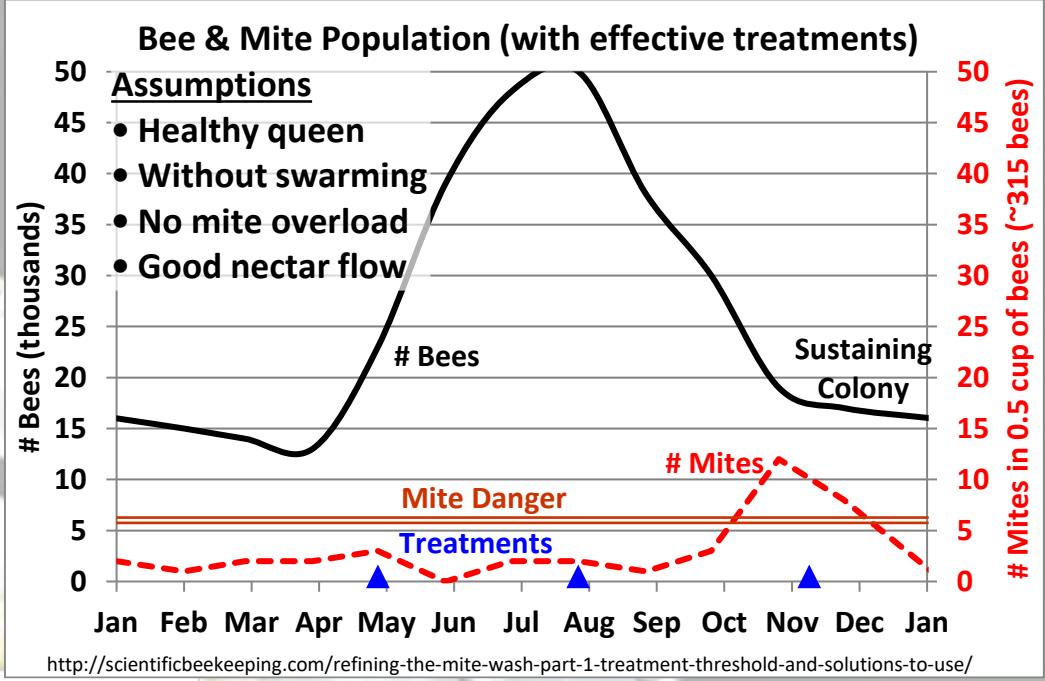
# How Do I Combine Hives?

- **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**

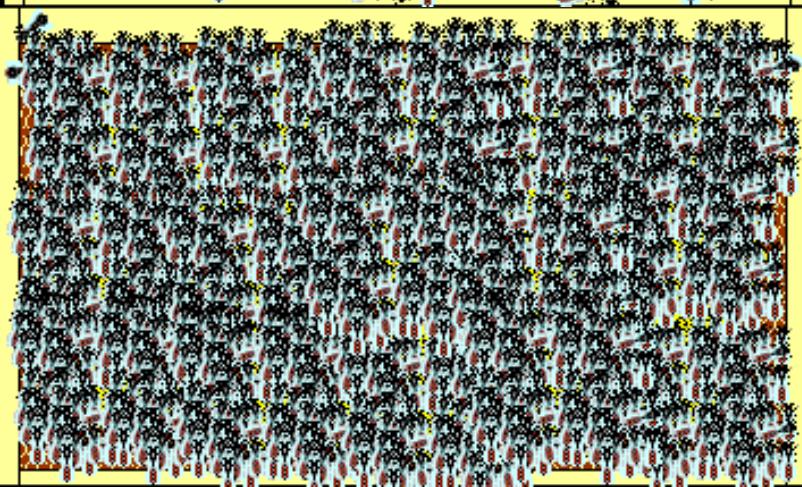
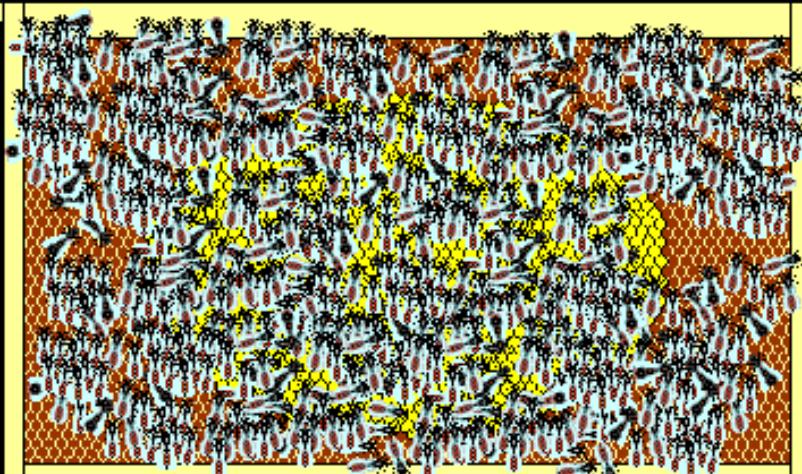
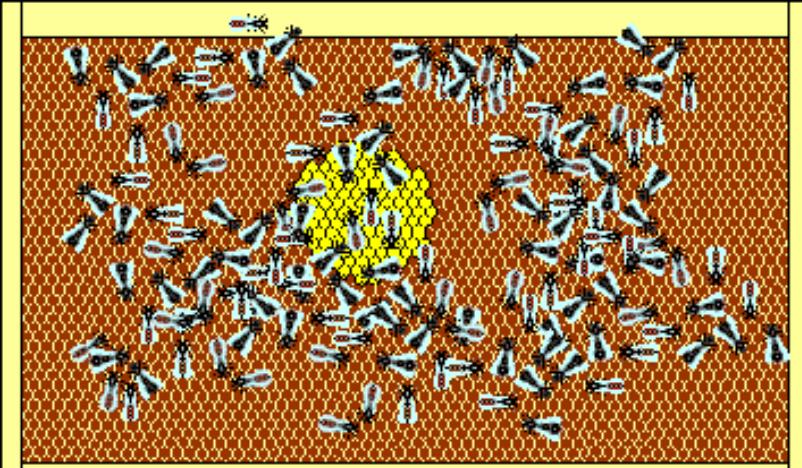


# How Many Bees in a Hive?

- **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 bees 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!)**

**Thanks to Dave Cushman**

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



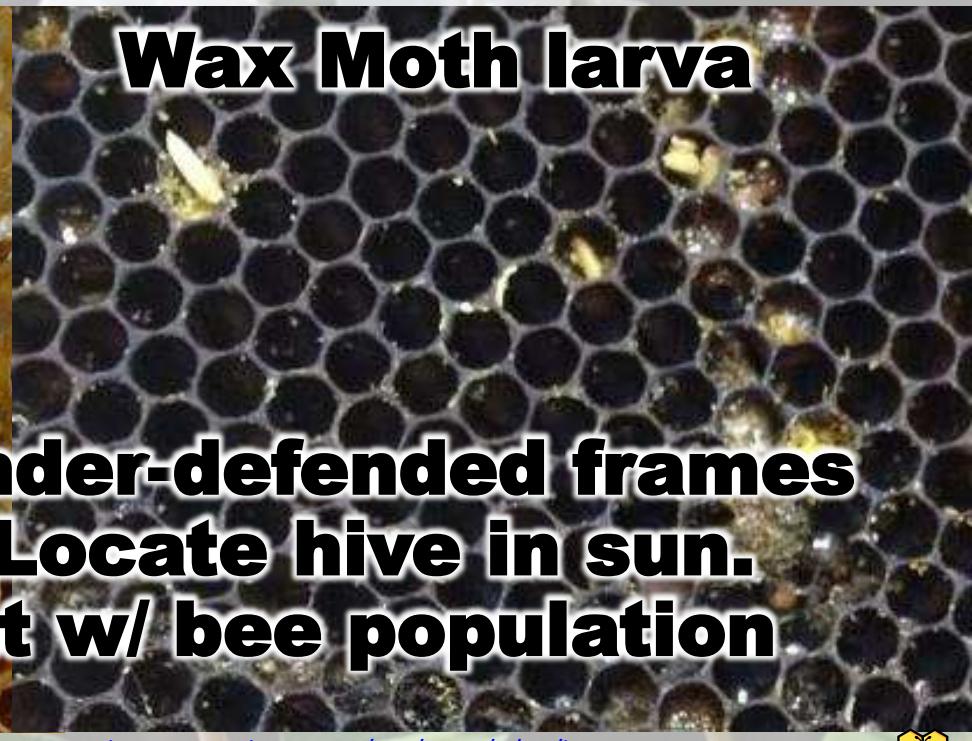
# What if My Bees are Gone?

- **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](http://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\*\*](http://www.epa.gov/pollinator-protection)

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



# 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 bees herd stock to better pasture**
  - **Commercial migratory pollinators are hard-working heroes, critical to agriculture**
  - **[scientificbeekeeping.com/the-rules-for-successful-beekeeping/](http://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.**



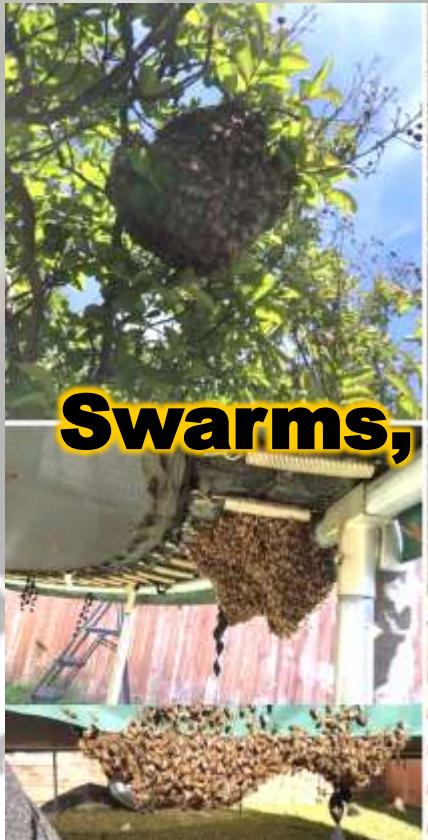
# When Should I Re-Queen?

- 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 gets to decide level of intervention



# Bee Removals

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



- 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/](https://metrobeekeepers.net/bee-removal/)

**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 60,000+ 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.

Call a SWARM of Honey Bees

Call a HIVE of Honey Bees

## • TX Apiary Inspect Svc

[txbeeinspection.tamu.edu/bee-removal/](https://txbeeinspection.tamu.edu/bee-removal/)

### 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/](https://txapbr.org/)

Home About Us For Removers



Texas Association  
— or —  
Professional Bee 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/](http://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

## Diseases

Viruses via varroa  
 Foulbrood  
 Nosema  
 etc

## Animals

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

## Parasites & Pests

Varroa Mites  
 Small Hive Beetle  
 Wax Moths  
 etc



## Poor Nutrition

Not enough nectar & pollen  
 Flowerless landscapes  
 Mono agriculture  
 Herbicides

## 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/bugsquad//blogfiles/62719\\_original.jpg](https://ucanr.edu/blogs/bugsquad//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	<b>Easiest, Not bother bees</b>	<b>Easy</b>	<b>Most accurate</b>
Cons	<b>Least accurate</b>	<b>Less accurate</b>	<b>Kills 300 bees</b>
Process	<b>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.</b>	<b>Put ½ cup of nurse bees (not queen!) in jar + 2 TB powdered sugar &amp; screened lid, shake 2 min, pour mites &amp; sugar thru screen, release bees, count mites, kill mites</b>	<b>Put ½ cup of nurse bees (not queen!) in jar with alcohol, swirl 30 sec, count mites. This kills bees &amp; mites.</b>
Warning Limit	<b>May: 9 mites/24 hrs Aug: 12 mites/24 hrs</b>	<b>4 mites (some mites are missed)</b>	<b>May: 6 mites (2%) Aug: 9 mites (3%)</b>
Links	<a href="http://betterbee.com/instructions-and-resources/using-sticky-boards-to-monitor-varroa-mites.asp">betterbee.com/instructions-and-resources/using-sticky-boards-to-monitor-varroa-mites.asp</a> <a href="http://ontario.ca/page/varroa-mites">ontario.ca/page/varroa-mites</a>	<a href="http://carolinahoneybees.com/varroa-mites-and-bees/">carolinahoneybees.com/varroa-mites-and-bees/</a>	<a href="http://scientificbeekeeping.com/first-year-care-for-your-nuc/">scientificbeekeeping.com/first-year-care-for-your-nuc/</a>

• 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 Downey, Exec Dir Project APIS m ([www.projectapism.org](http://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

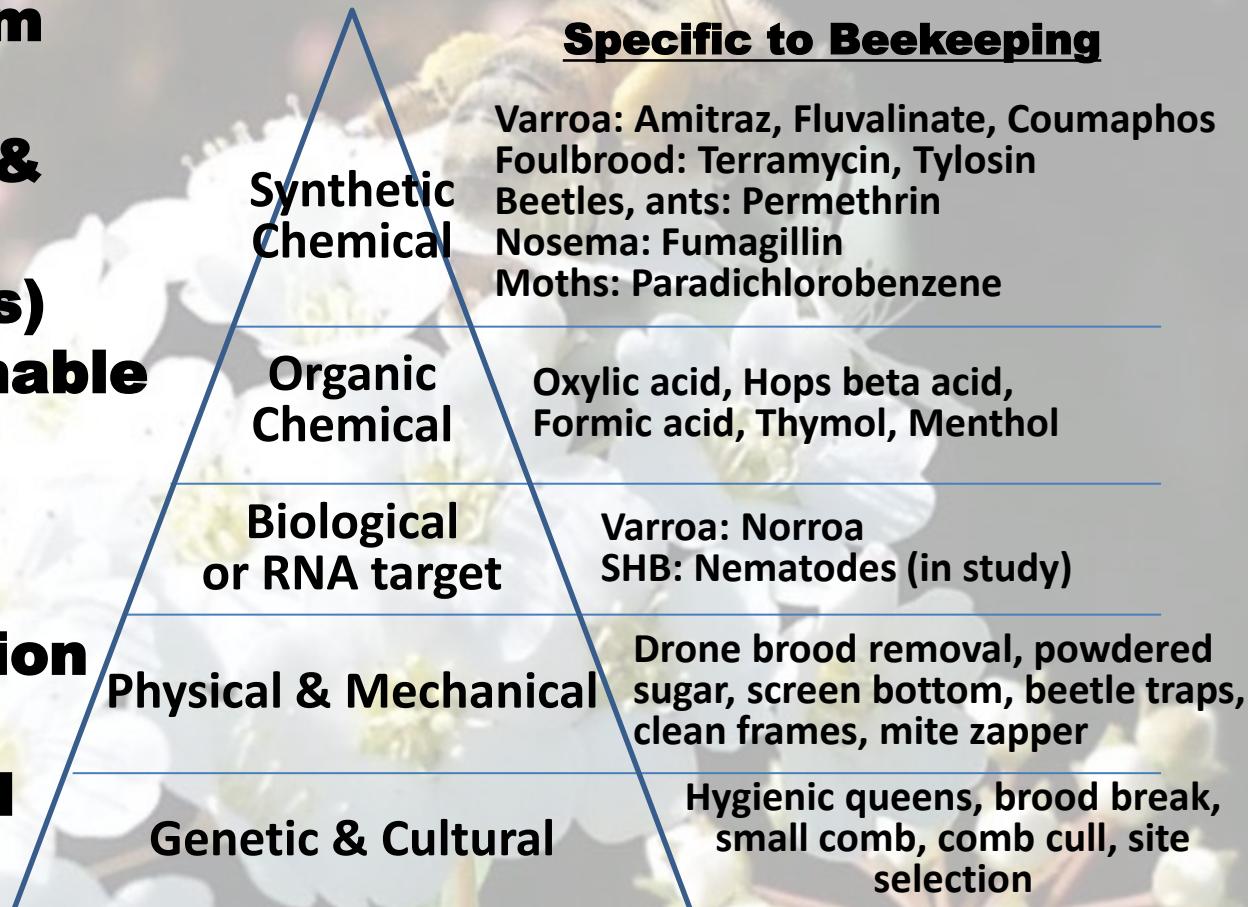
# Integrated Pest Management

- **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**

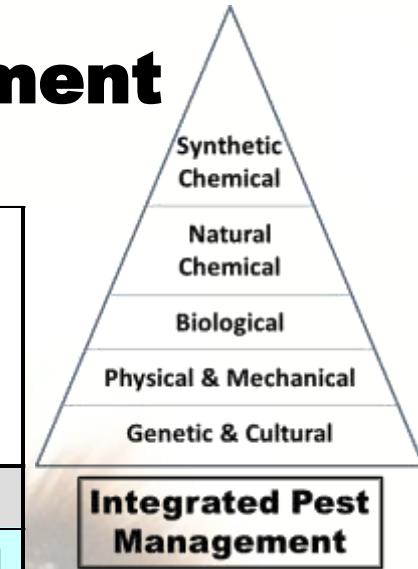


**Rotate Methods to Reduce Resistance**

# 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			



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%

- Move up the Integrated Pest Management triangle

Info compiled from [honeybeehealthcoalition.org/Varroa/](https://honeybeehealthcoalition.org/Varroa/) 2021

Treatment	Ess Oil	Org Acid	Synth Chem	Non-Chem	Mite kill	Improved Losses	Residues	Temp, °F	With supers				No Brood			With Brood				
									With supers			No supers			No suppers					
									Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm
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 (Apivar, Taktic)		Y			95%	41%	Yes	Any					H	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

- Powerful info about effectiveness, pros & cons
- 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?

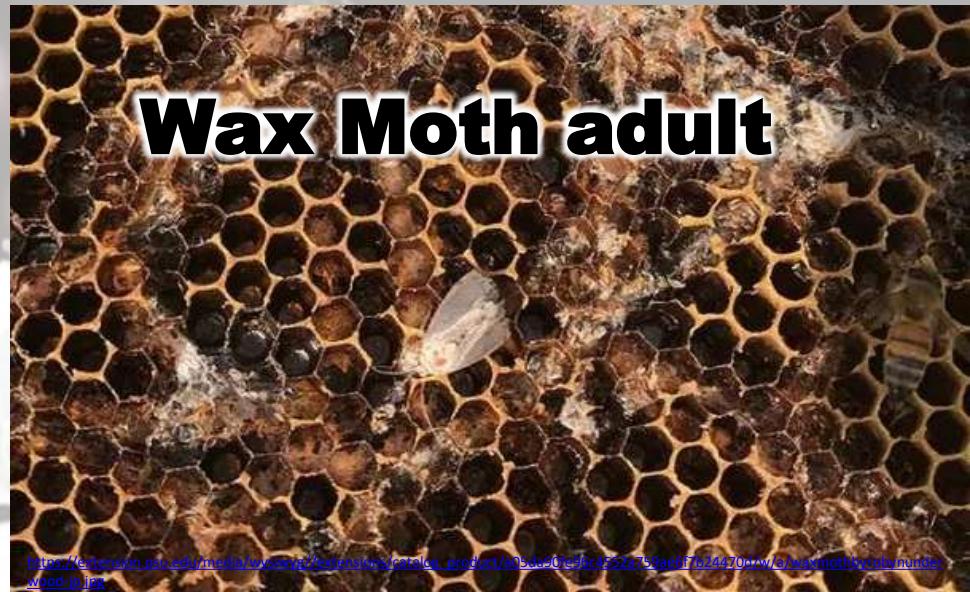
## Small Hive Beetle, SHB, adult



## SHB larva



## Wax Moth adult



## Wax Moth larva



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

[www.homesweetbees.com/\\_/r/a/2015\\_11\\_20/how-to-save-one-remaining-hive-from-small-hive-beetles](https://bee-health.extension.org/managing-small-hive-beetles/)

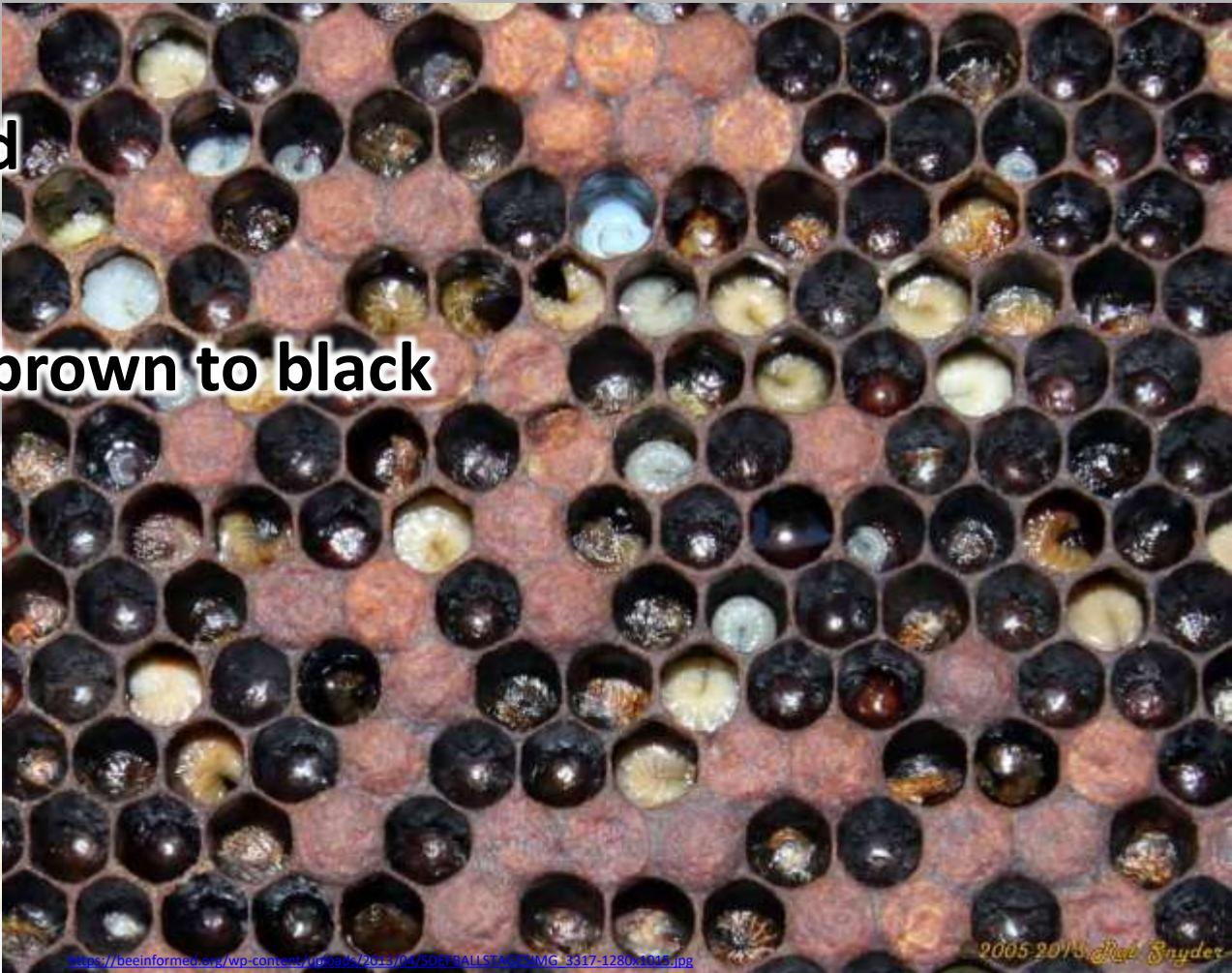
# What Diseases Are Threats?

European Foulbrood

Rare

Bacteria, treatable

Larva dull white to brown to black



[https://beeinformed.org/wp-content/uploads/2013/04/SDEFBALLSTAGESIMG\\_3317-1280x1018.jpg](https://beeinformed.org/wp-content/uploads/2013/04/SDEFBALLSTAGESIMG_3317-1280x1018.jpg)

2005-2018 Greg Snyder

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

# What Diseases Are Threats?

## Deformed Wing Virus, DWV



## Varroa Mites

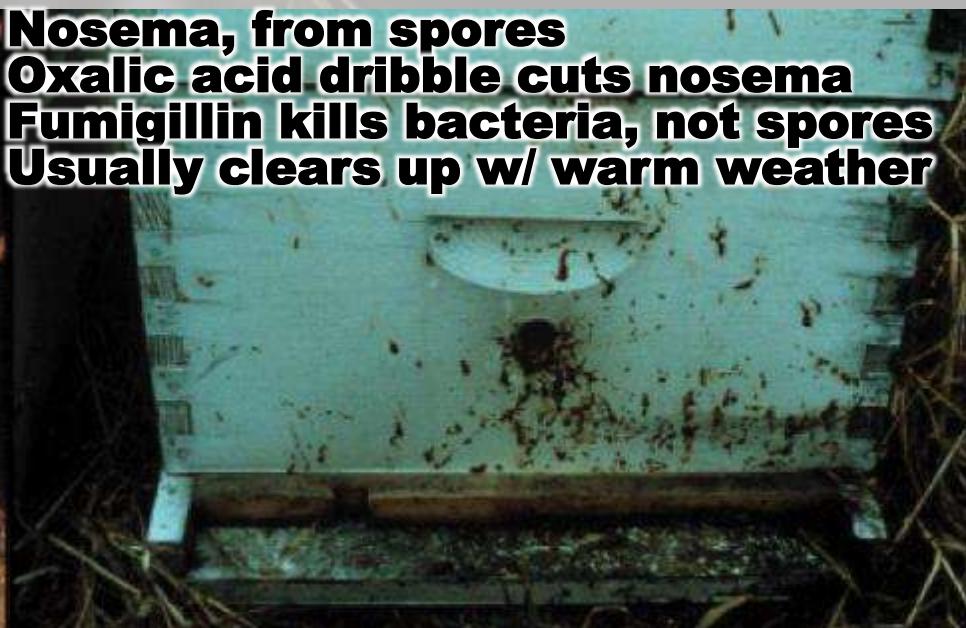
© MATT BEARUP

[https://c2.staticflickr.com/6/5280/5910390281\\_4b19af7deb\\_b.jpg](https://c2.staticflickr.com/6/5280/5910390281_4b19af7deb_b.jpg)

## American Foulbrood, Bacteria, very rare, catastrophic



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

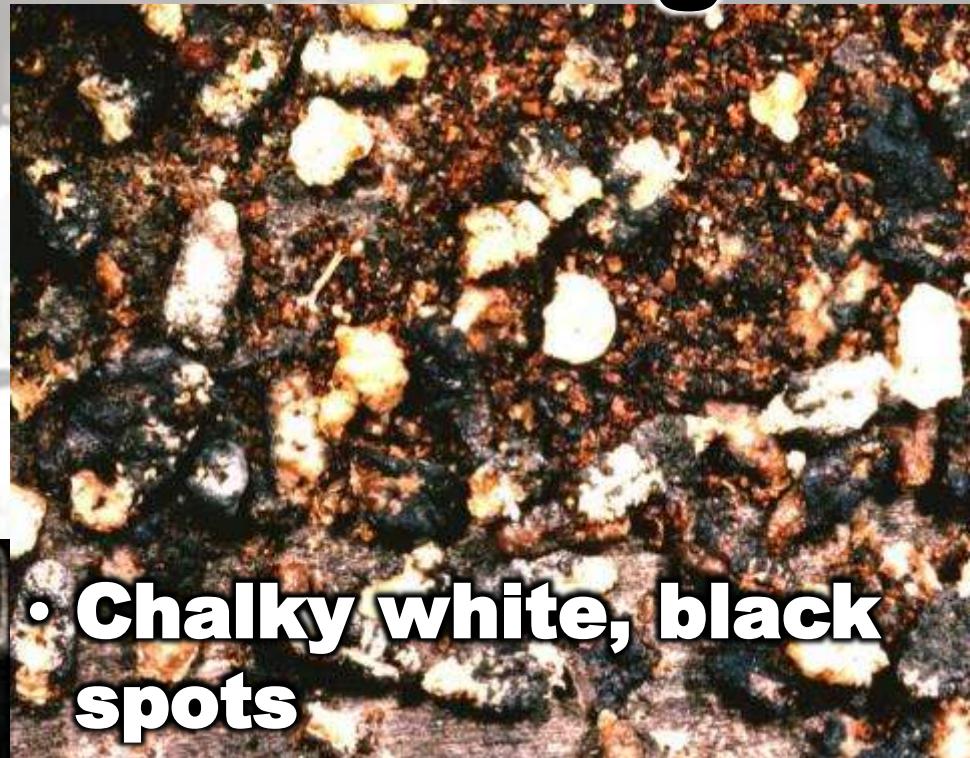


# Sacbrood from Virus



- **Dull white to brown to black**

# 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



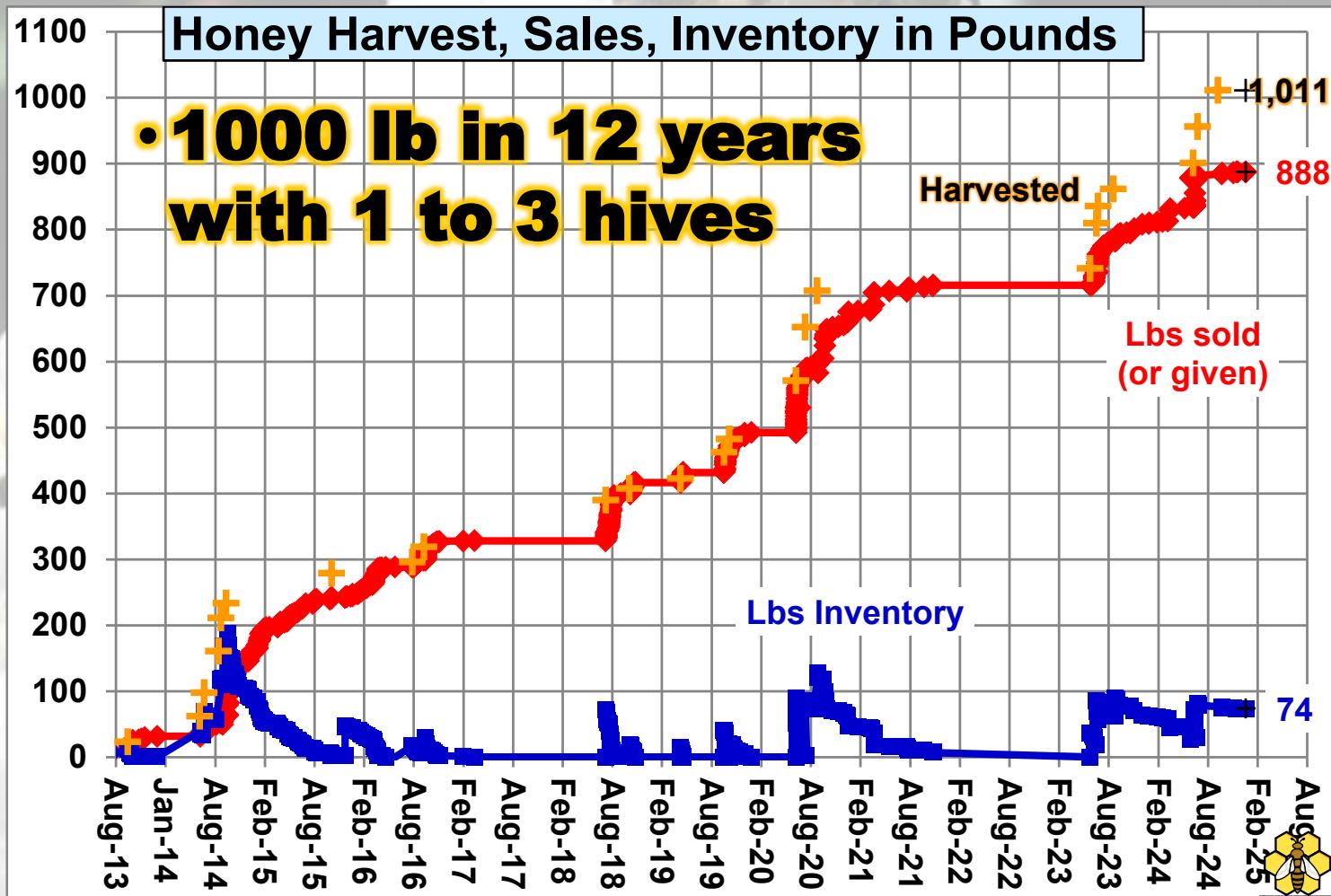
Ft Worth, Jan 2025



# 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		
Label	Product: Honey, Pure Honey, Raw Honey, etc. Name & place of business Net weight in both English & metric units <b>(No longer requires label about inspections.)</b>	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	<b>"Do not feed honey to infants under one year of age."</b>		
Employees?	<b>Anyone associated with the farm/apiary</b>	Employees may produce & sell	Any
Sales limits	In TX. <b>No sales limit.</b>	In TX. < \$50,000 / year.	No limit
Customers	<b>Can sell to consumers &amp; re-sellers in TX.</b>	Sell only directly to consumers in TX.	Any
Location of sale & delivery	<b>In person, phone, mail, online, can mail.</b>	If sold online, must deliver in person. If sold in-person, can be mailed.	Any
Advertising	No restrictions (internet advertising allowed)		
Licenses	<b>None reqd, but Food Handler recom.</b>	Food Handler's Card (\$7 online)	Biz, Food
Local govt	<b>May not regulate or inspect without a warrant. Must record complaints.</b>		
Taxes	<b>No Texas sales tax on honey (food item). Federal income tax per IRS code.</b>		

\* 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

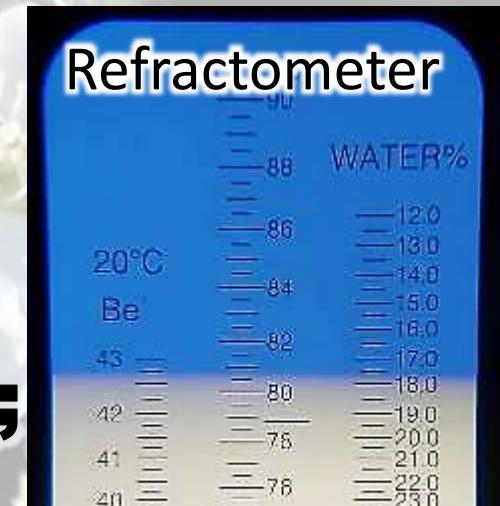
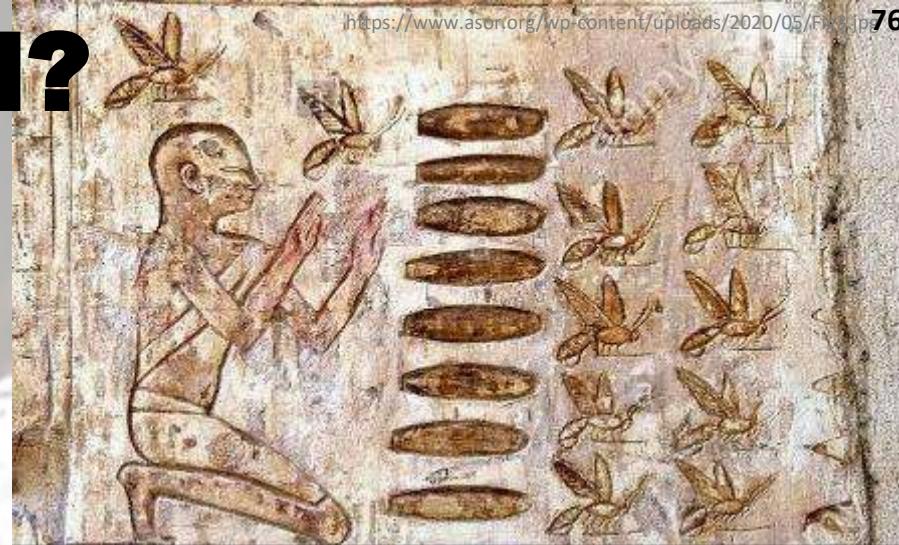


# Types of Honey

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



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=c1rS7eAmhvM](https://www.youtube.com/watch?v=c1rS7eAmhvM)

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?



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

Provide a Box  
for Shelter

I have  
a cat

I have  
bees



A cat  
has me!

Provide Food, H<sub>2</sub>O,  
Meds, & Post Pics



I'm a beekeeper



<https://www.farmandfleet.com/blog/when-to-feed-your-backyard-bees/>

# Some of Our Favorite Resources

Group	Notes	Link
Metro Beekeepers	Take <a href="#">MBA Class</a> . Attend monthly mtgs, Q&A. Read online <a href="#">Resources</a>	<a href="#">metrobeekeepers.net</a>
The Bee Supply	Monthly webinar, magazine, training, equip, bees	<a href="#">thebeesupply.com/</a>
Honey Bee Suite	Rusty Burlew	<a href="#">www.honeybeesuite.com</a>
Carolina Honeybees	Charlotte Anderson	<a href="#">carolinahoneybees.com</a>
Scientific Beekeeping	Randy Oliver, biologist, does experiments & publishes data, observations, lessons	<a href="#">scientificbeekeeping.com</a> <a href="#">scientificbeekeeping.com/first-year-care-for-your-nuc/</a>
Honey Bee Health Coalition	Developed guide for varroa management & other resources	<a href="#">honeybeehealthcoalition.org</a>
Dadant	Learning center, equipment, bees	<a href="https://www.dadant.com">https://www.dadant.com</a>
Texas Beekeeping Assoc	Beekeeper news, Club locations & contacts, clinics, convention, journal (past issues free)	<a href="#">texasbeekeepers.org</a>
Bee Culture	Monthly magazine (subscription)	<a href="#">www.beeculture.com</a>
American Bee Journal	Monthly magazine (subscription)	<a href="#">www.dadant.com</a>
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
<b>Register</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Keep bees</b>	<b>1 year</b>	<b>+1 year</b>	<b>+1 year</b>
<b>Online training</b>		<b>6 modules</b>	<b>Expert in 3 credits in major + 5 credits outside major</b>
<b>Written exam</b>	<b>&gt; 70%</b>	<b>&gt; 70%</b>	<b>&gt; 70%</b>
<b>Practical exam</b>	<b>&gt; 70%</b>	<b>&gt; 70%</b>	
<b>Public service</b>		<b>5 credits</b>	<b>+10 credits</b>

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

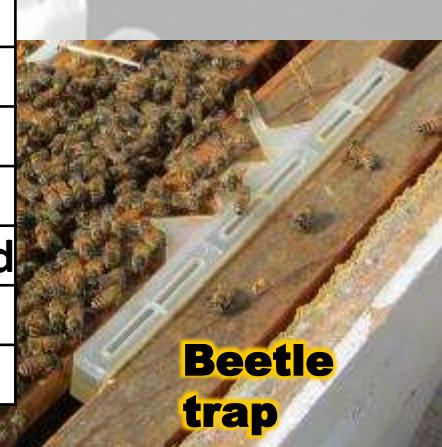
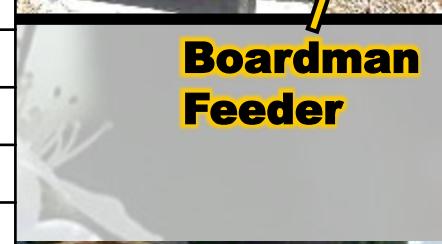


# Terms

83



Abscond	All bees leave, boxes empty
Apiary	Bee yard
<a href="#">Apivar</a>	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.
<a href="#">Burr comb</a>	Bees built inconvenient comb
CCD	Colony Collapse Disorder
Cell	Wax comb hexagon shape
<a href="#">Chalkbrood</a>	Brood disease from fungus
Checkerboard	Alternate honey frames, not brood
<a href="#">Combine</a>	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

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

**Wood frame  
No foundation**

**Wood frame  
Plastic foundation**



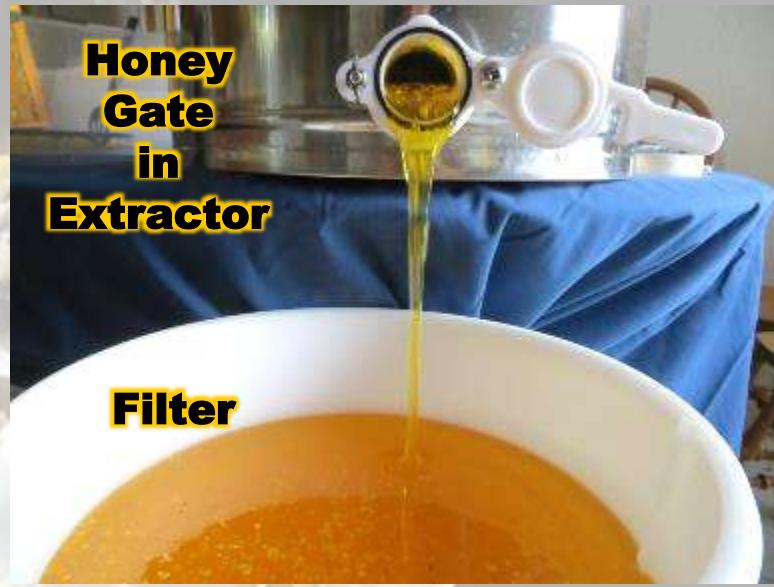
# Terms

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
<u>MBA</u>	<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
<u>Nuc (Nucleus)</u>	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"

Mouse  
guard

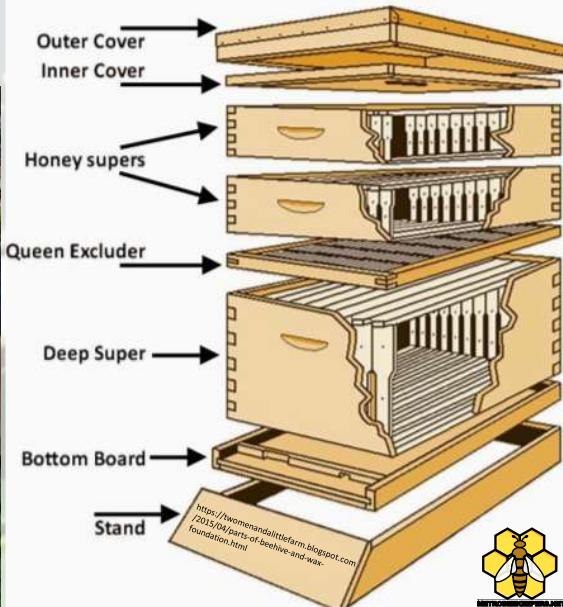
Hive Tool



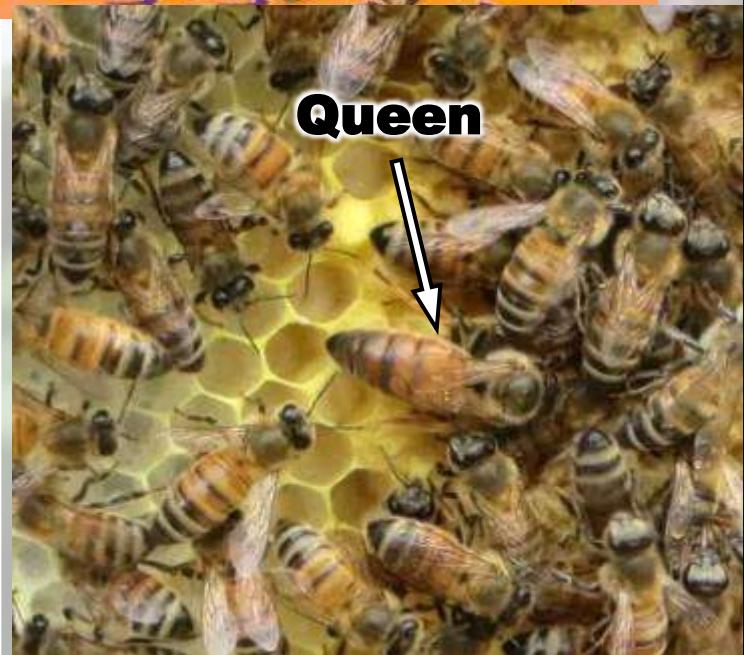
Filter



Langstroth Hive



# Terms



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

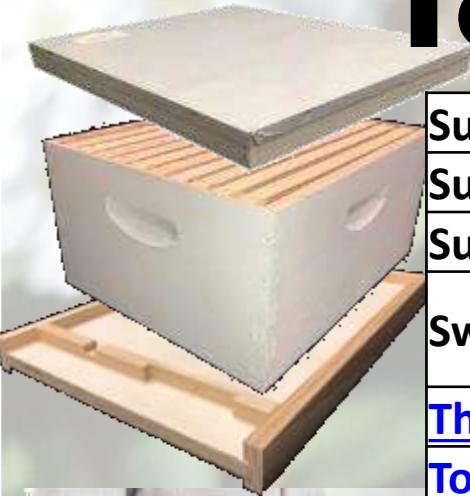


**Top Cover**

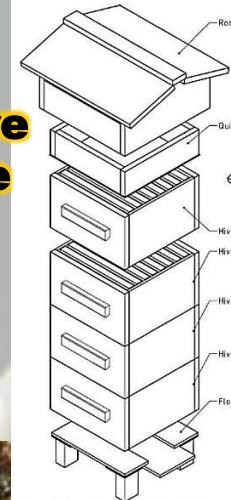
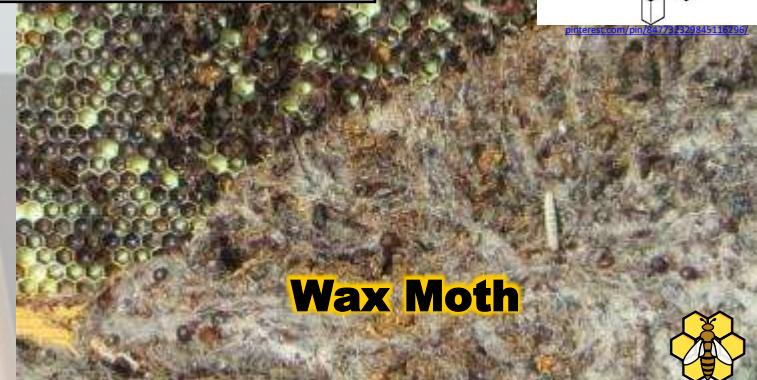
# Terms

**Uncapping Tools**

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**Top Bar Hive**

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

**Warre Hive****Worker****Wax Moth**

# Happy Beekeeping



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

