

# **Backyard Beekeeping, Our Approach & Experiences**

**by Gretchen & Russ  
Killingsworth**

**Honey Bee on Indian Hawthorne  
in our backyard**



# About Us

- **Beekeepers since 2012**
- **1 to 4 hives in neighborhood backyard (sometimes zero)**
- **Harvested >800 lbs honey, propolis, wax**
- **Metro Beekeepers Association**
  - **Members since 2012**
  - **On Board since 2020**
- **Gretchen**
  - **MBA class teacher 2020, '21, '22, '23, '24**
  - **MBA youth scholarship mentor**
  - **Honey sales at Saginaw Farmers Market**



# Why Keep Bees?

- **Fascination**
- **Honey, wax, propolis**
- **Bees pollinate flowers & gardens**
- **Help bees counter threats**
- **Pollen can reduce symptoms of allergies**
- **Improve arthritis**
- **Ag exemption (tax savings, rural property)**



**North wind break,  
incl skirt on shed**

**Workspace in back  
& sides**

# **Our Backyard Apiary**

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



**Langstroth  
10 frame**



**Dry,  
Level**

**Entrance reducers**



**Top Bar**

**Stand &  
Bug barrier**

**Facing south or east**

**Away from  
foot traffic**

**Mulch, Grass deterrent**

**Nearby sources of water, nectar, & pollen**

# Sample Starter Kit

Suit with Veil		\$80 to \$240
Gloves		\$25 to \$30
Hive Tool		\$13
Bee Brush		\$15
Smoker		\$43
Bottom Board, Reducer		\$44
Inner Cover		\$18
Telescoping Cover		\$37
Deep Hive Box	• Shop around	\$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)

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



# How We Became Beekeepers

<b>Learn</b>	<b>Class, Club, Webinars, Books, Laws, Bee yard</b>
<b>Location</b>	<b>Laws, Sun, Dry, Level, Stand, Neighbors, Water, Mosquito Dunks, Wind-protection</b>
<b>Get Stuff</b>	<b>Veil, Gloves, Suit, Hive tool, Smoker, Bottom board, Deep box w/ frames, 2 med boxes w/ frames, inner cover, top cover, queen excluder, entrance reducer. 2 or more hives? Epi-pen?</b>
<b>Get Bees</b>	<b>Nuc, swarm, package, hive</b>
<b>Inspect</b>	<b>Queenright, nutrition, pests, disease, housing</b>
<b>Act (one step at a time)</b>	<b>Feed syrup? Feed pollen? Treatments? Supers? Rotate? Reducer? Excluder? Split? Combine? Requeen? Harvest? Remove boxes? Sell? Store frames? Order? Maintain? Insurance? Records? Plant &amp; water bee-friendly plants? Taxes, Ag?</b>
<b>Keep Learning</b>	<b>We encountered new situations for years, even still. Stay connected w/ MBA &amp; good resources.</b>
<b>Resources</b>	<b><a href="#">MBA</a>, <a href="#">thebeesupply.com</a>, <a href="#">scientificbeekeeping.com/</a>, <a href="#">beeinformed.org/</a>, <a href="#">honeybeehealthcoalition.org/</a>, <a href="#">www.dadant.com/learn</a></b>

**• Don't give up. You can do this! MBA can help!**

# Fort Worth is Bee-Friendly

## Urban agriculture uses in Fort Worth Adapted from the Fort Worth Zoning Ordinance

Allowed\*

Zoning district	Community garden	Urban farm	Aquaponics, within a structure	General signage	Temporary sales	Farmers' market	Sale signage	Honeybees	Self-pick sales	Warehousing/distribution
Residential	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Commercial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Industrial	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\* See zoning ordinance for conditions.

- **Know your local laws**
- **Laws vary by city, county, & state**
- **HOA considerations**

<https://www.fortworthtexas.gov/departments/development-services/zoning/ordinance>

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

# Fort Worth Ordinance 21653

- **# Hives**
- **6' fence**
- **Water**
- **Robbing**
- **Aggressive**

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

- a. The responsible parties, who are beekeepers, must adhere to all applicable state laws concerning the care and handling of bees;
- b. Honeybee colonies are kept in hives with removable frames or top bars with dividers, which shall be maintained in sound working condition;
- c. 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.
- d. 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
- e. 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.
- f. **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.
- g. 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
< $\frac{1}{4}$ acre	2
$\frac{1}{4}$ to $\frac{1}{2}$	4
$\frac{1}{2}$ to 1	6
> 1 acre	No limit

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



# **We Have Good Neighbors**

- **In addition to obeying the law (fence, etc),**
- **Talk with neighbors before they talk to you**
  - **Wild bees were here when we had no bees**
  - **Explain our considerations to be friendly to them**
  - **Ask how they feel. All were supportive, ...**
- **Reward neighbors with honey**
- **We are fortunate to have Good Neighbors who care about bees**

# Hawaiian Beekeeping



# Clothing

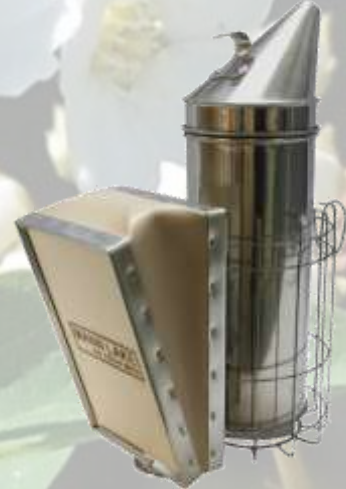


- **Protect face & eyes, as a minimum**



- **Texas bees can be aggressive**
- **We have encountered bad surprises**

# Essential Tools



# Inspections

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

- Think ahead
- Do we need to do anything to help the bees?
- MBA resources
- <https://metrobeekeepers.net/this-month-in-the-hive-inspection-checklist/>

## 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.)

### 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 (clean?)
- Cell Level
  - 1 egg at bottom of cell
  - 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?

# Threats to Bees, Warrant Inspections

## Diseases

### Viruses

Foulbrood  
Nosema  
etc

## Animals

Small Mammals (skunks, mice)  
Large Mammals (livestock, bears)  
Birds  
People

## Parasities & 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 their bees**



# Inspection

Propolis

Capped honey

Burr comb



Capped brood

Pollen

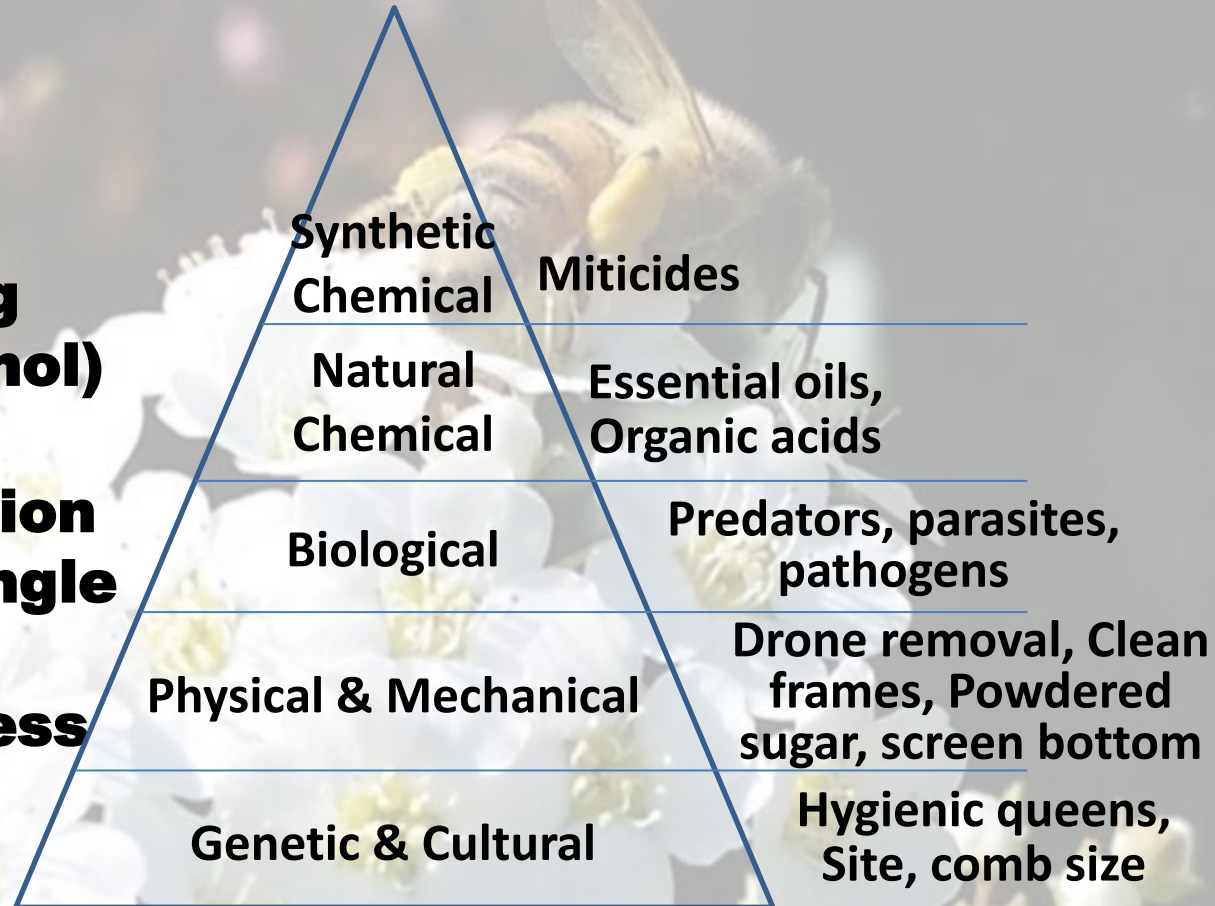
Drone comb

Burr comb

# Integrated Pest Management (IPM)

## • Principles:

- **Monitor by testing (CO<sub>2</sub>, sugar, alcohol)**
- **Treat as Needed**
- **Minimal intervention (move up the triangle with caution)**
- **Check effectiveness by re-testing**
- **Adapt & adjust**



**Rotate treatment methods to reduce resistance**



# When Mite Count is Below Threshold

- **Continue sustainable Integrated Pest Management to try to keep mite count low**

Treatment	Ess Oil	Org Acid	Synth Chem	Non-Chem	Mite kill	Losses	Improved	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

- **Combine powder sugar dust + drone brood removal**
- **Sanitation: cull old brood comb, space out colonies, sunny area w good drainage, clean tools btn colonies, freeze frames**

# When Mite Count is Above Threshold

- **Move up the IPM triangle**

Treatment	Ess Oil	Org Acid	Synth Chem	Non-Chem	Mite kill	Improved Losses	Residues	Temp, °F	With supers				No Brood				With Brood			
													No supers				No supers			
									Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm	Incr	Peak	Decr	Dorm
Formic acid (MAQS, Formic Pro)		Y			80%	24%	No	50°-85°	H	H	H	M	H	H	H	M	H	H	H	M
Oxalic dribble		Y			90%	39%	No	Any					Y	M	M	Y	Y	M	M	Y
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	
Oxalic acid fume		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
Fluvalinate (Apistan)			Y		97%*	7%	Yes						Y		L		Y		L	
Coumaphos (Checkmite)			Y		92%*	6%	Yes						Y		L		Y		L	

\* For non-resistant mites

- **Brood & broodless are same except for Oxalic Acid (but OA is ok to use w/ no brood at any season)**
- **Effectiveness changes (resistance, advancements)**
- **Rotate treatment methods to reduce resistance**
- **Powerful info about effectiveness, pros & cons**
- **Read the directions & choose your options**

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

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

# Where Did We Get Bees?

- **Local beekeeper**
  - **Nucs**
  - **Queens**
  - **Complete hive**
- **Through the mail**
  - **Queens**
  - **Packages**
- **Catch a swarm**
- **Rescue unwanted established hive**
- **Splits**



**• 200 bees flying free (Everything leaks) We are fully suited**



# Catching a Swarm

- **Be Prepared**
  - **Clothing**
  - **Nuc box w/ frame(s)**
  - **Ladder?**
  - **Brush**
  - **Syrup spray**
- **Mist cluster with syrup**
- **Brush bees into nuc box**
- **Make sure queen is there**
- **Time for bees to gather**
- **Close up**



Swarm →

Nuc box →

Brush →

Syrup spray →

10 ft ladder →



# Swarm vs Hive

Swarm 21



Hive

- **Swarm**
  - **Bees looking for a new home**
  - **No wax, brood, or stores**
  - **Very calm**
- **Hive**
  - **Bees have built a home here, wax comb**
  - **Brood & stores to protect**
  - **Varying temperament**

# Harvesting



Bin(s) with lid  
& empty boxes



Buckets  
w/ Lids



# Harvesting, Inside

- Clean all equipment
- Remove bees
- Put box on tray
- Uncap 2 frames
- Spin frames in extractor
- Drain into bucket
- Have fun





**Extractor**

**Open gate  
over filter**

**Filter on Food  
Grade Storage  
Bucket**



- **At least 1 day later**
- **Weigh filled jar to know the right level**



# HONEY



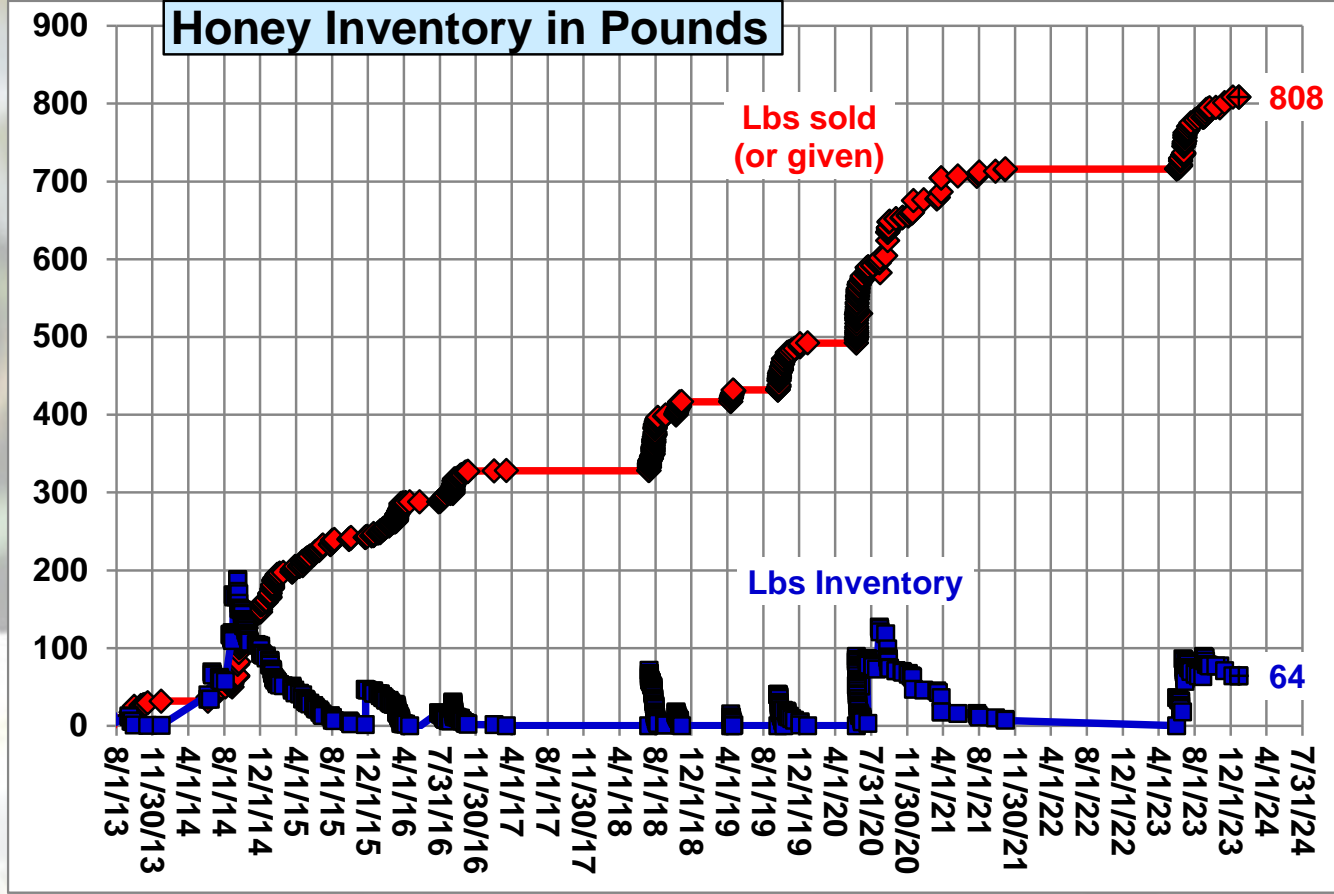
## FOR SALE



Add labels

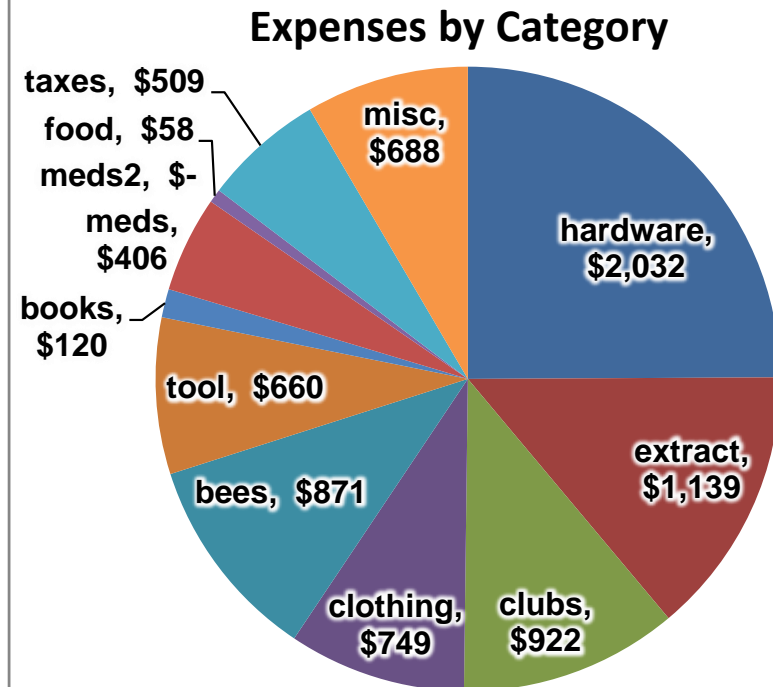
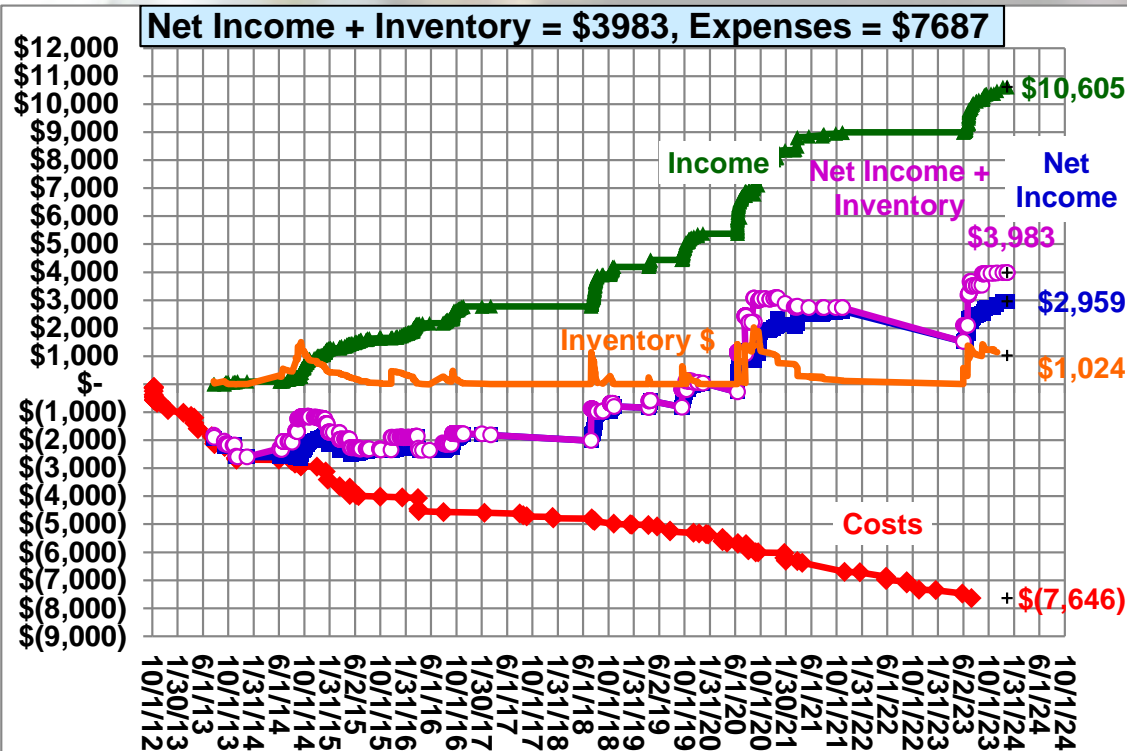
Oh, & clean all the equipment again

# Honey Harvest, Sweet Rewards



- **Some years were better than others**
- **Affected by weather, # of colonies we kept, the time/work we put into it**

# Expenses & Income



- **So far, spent \$7.6k & received \$10.6k**
  - We didn't need all the stuff we bought
- **For us, it's not about the money, but it was nice when we broke even**

# Consider Encouraging Beekeeping<sup>29</sup>

- **Inspire & educate others**
- **Be a mentor**
- **Many want to learn about bees**
  - **Friends, Family, Schools, Nature Centers, Garden Clubs, Youth Org, Beekeeper Clubs**
- **Volunteer to serve on MBA Board**
- **Say nice things about bees at parties**
- **Whatever is a good fit for you**





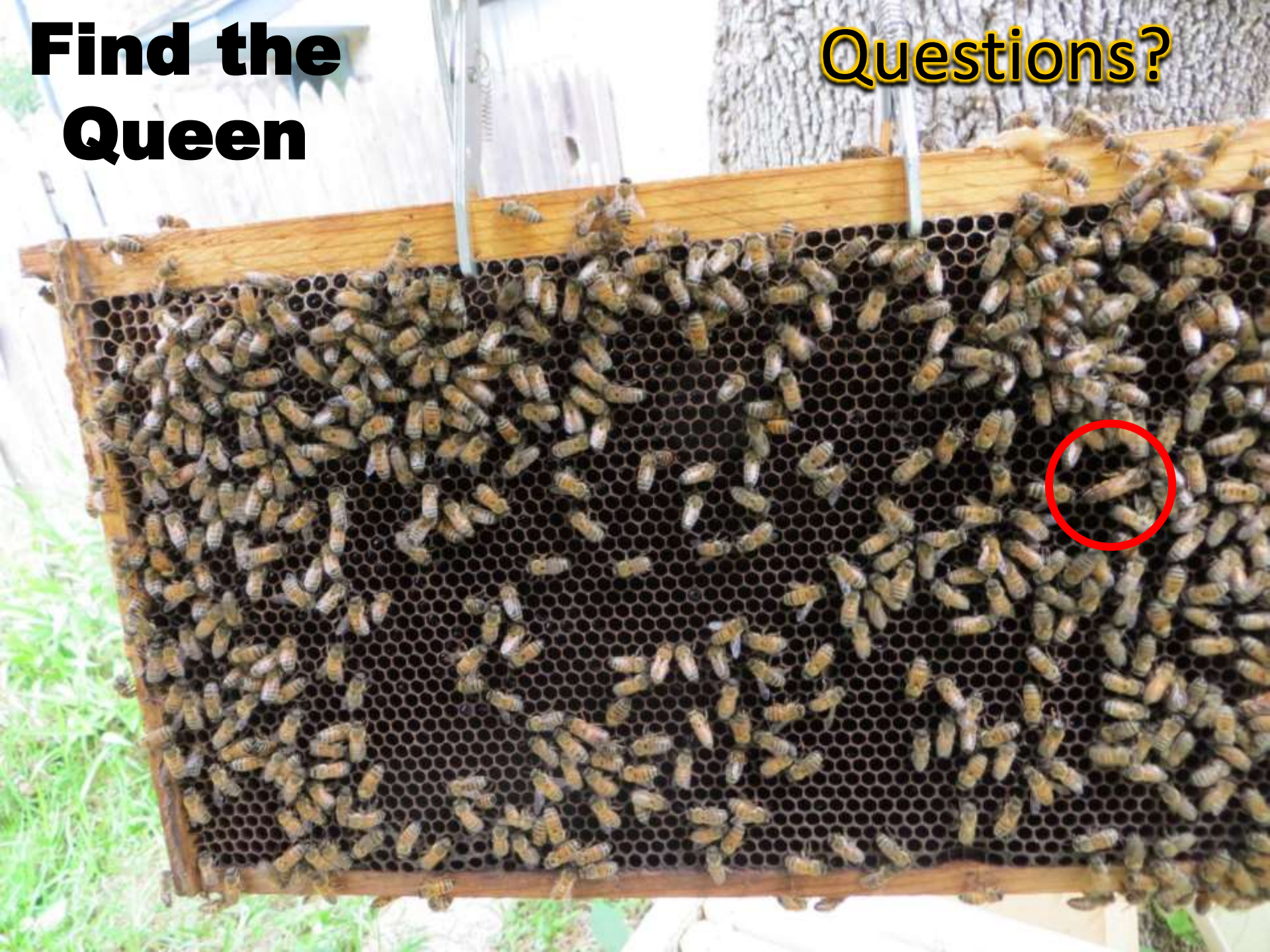
**Kindergarten Classes**

# What We Didn't Have Time to Talk About

- **Deal with specific warnings in inspections (pests, diseases)**
- **How to do a mite count**
- **Treatment options**
- **Find the queen**
- **Re-queening**
- **Install nucs, packages, new queens**
- **Reducing swarming pressure**
- **Laws about selling honey & products**
- **What to do after a sting. Variety of reactions, even when not allergic.**
- **Colony Losses, Disappointment, Rebuild**
- **Cutouts, Trap-outs**
- **Ventilation**
- **Using Queen excluders**
- **Feeding by season**
- **Dealing with hot bees**
- **Where could we get more information**

**Find the Queen**

Questions?







**Find the  
Queen**

**Did we  
mention to  
not give up  
after losses**