
Beekeeping for Mortals

Keeping it practical, simple & cheap

— April 30, 2023 —
John Manchester
Shipmast Farm @ TipToe, LLC

Today

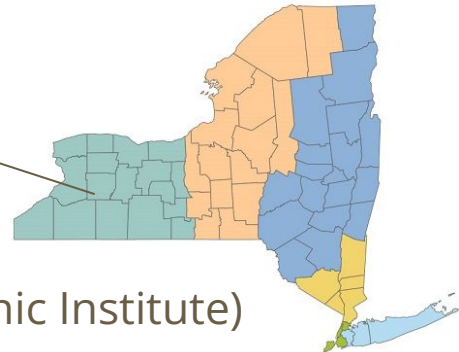
2:00 - 2:45 Interactive presentation

2:45 - 3:00 Honey & Biscuits

3:00 - 3:30 Q&A

About John

Wyoming County
Pop. 41,425
( 100,000+)



- 1991 BS Biology, Biomedical Engineering (Rensselaer Polytechnic Institute)
- 1993 DOE Fellowship, Enzyme engineering / bioremediation (Richland WA)
- 1996 PhD, Biophysics / theoretical chemistry, (SUNY Buffalo)
- 1997 Post-doctoral fellowship, U of Rochester, Drug metabolism
- 2001 Antibacterial comp. drug discovery, AstraZeneca (Waltham MA)
- 2015 Computer-aided drug discovery, Novartis (Cambridge MA)
- 2017 Started hobby beekeeping
- 2021 Transitioned to “side-line” beekeeping (25-50 hives, business & licensing)
- 2023 Still not a master beekeeper. Just here to share what’s worked for me.

Presentation Outline

- The 3 Secrets & 2 Laws to keeping bees
 - Disease
 - Nutrition
 - Queens
- Providing a home for your bees
 - Equipment
 - Where to put it
- Working with bees
- Surviving Winter
- Being a good neighbor
 - Swarming - what to do & how to prevent
 - Managing disease
 - Eliminating aggression
- Practical tips (where not to be a cheapskate)
- Some useful resources

The 3 Secrets

1. Manage disease
2. Provide adequate nutrition
3. Maximize colony's ability to replenish population

Mites

Food

Queens

Bee diseases

1. **Varroa mite** (*Varroa destructor*)
2. Tracheal mite
3. Nosema
4. American foulbrood
5. European foulbrood
6. *Others...*

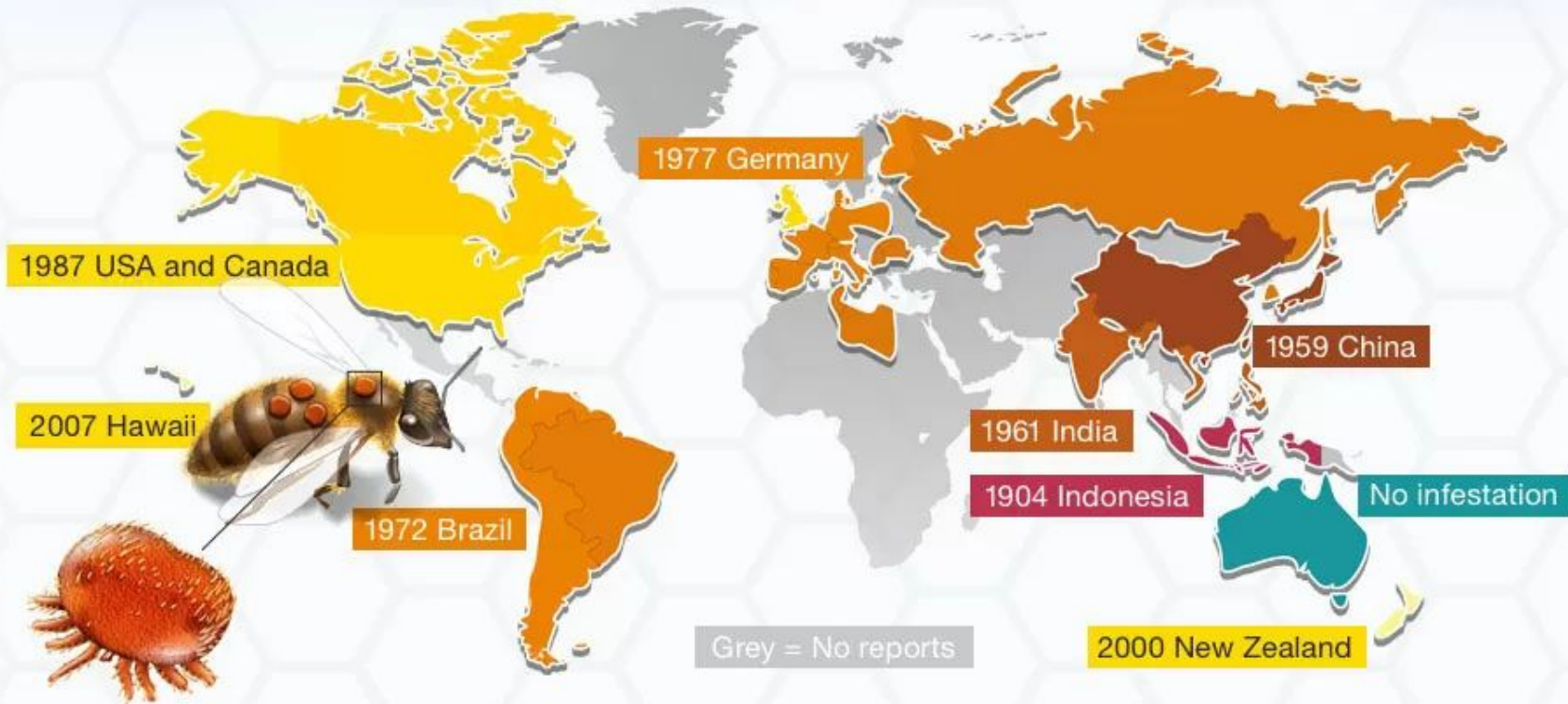
Varroa mite

- Related to ticks.
- Females lay eggs in unsealed brood cells (10x preference for drone brood).
- Mites feed on developing brood & inject viruses (e.g. deformed wing virus) which weakens colony.
- Adult mites attach to adult bees & spread to other bee colonies by detaching on flowers.
- Symptoms: K-wing, deformed wings, lethargy
- Most untreated colonies die after 1 year; ALL die by year 2.
- Variety of treatments (see IPM)



Where Does the Varroa Mite Come From?

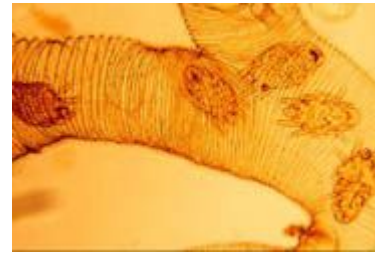
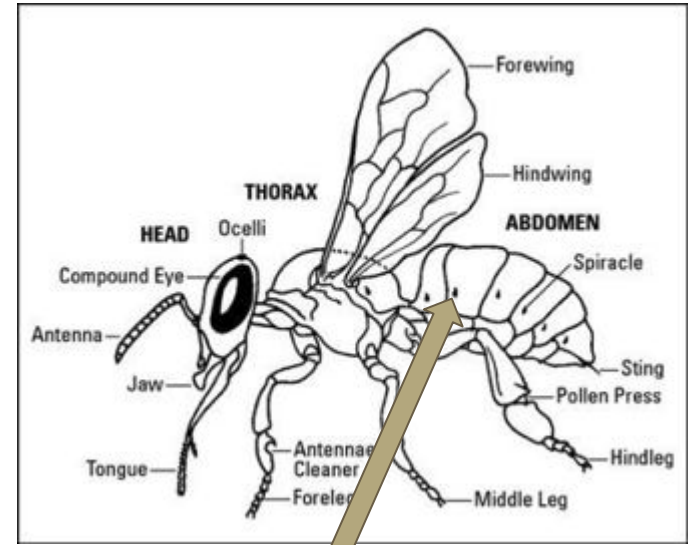
The Varroa mite originated in Asia, but has since spread towards the west and now threatens the western honey bee almost all over the planet. Only Australia has managed to keep the parasite at bay to date. The illustration shows when the mite first appeared and in which region.



Source: After Webster, Delaplane KS 2001, Mites of the Honey Bee

Tracheal mites (*Acarapsis woodi*)

- Parasitize honey bee trachea
- Believed to ingest parasites / viruses
- Dysfunction & death attributed to airway occlusion
- Symptoms: bees crawling in grass in front of hive
- Menthol & formic acid approved for treatment



Nosema (*Nosema apis*)

- Spore-forming fungus that infects gut
- Causes form of dysentery
- Symptoms: brown streaking on outside of hive
- Treatments: fumidil, spearmint etc. oil



Foulbrood

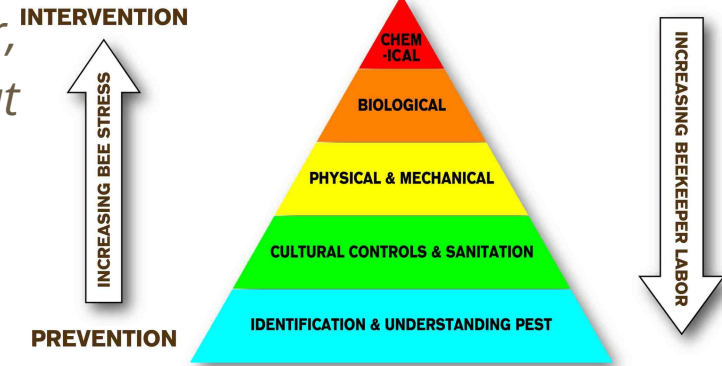
- Bacterial diseases infecting brood
- American foulbrood
 - Stringy (dead) brood
 - Fatal; treatment is burning the entire hive
 - Notify state apiarist and/or local beekeeping association if you suspect AFB in your apiary!
- European foulbrood
 - Yellow / brown brood
 - Highly contagious but not as serious as AFB; disease surfaces under conditions of stress



Integrated Pest Management (IPM)

Combining a variety of techniques to balance labor, cost and stress to bees while maintaining disease at acceptable levels. E.g.,

- Apivar (amitraz) in mid-March
- Apiguard (thymol) in September
- Oxalic acid in December
- Honey B Healthy whenever feeding syrup



When using ANY treatment: Do not prevaricate. Treat deliberately and FOLLOW THE INSTRUCTIONS!

Please don't contribute to drug resistance



What doesn't kill
us only makes us
STRONGER!

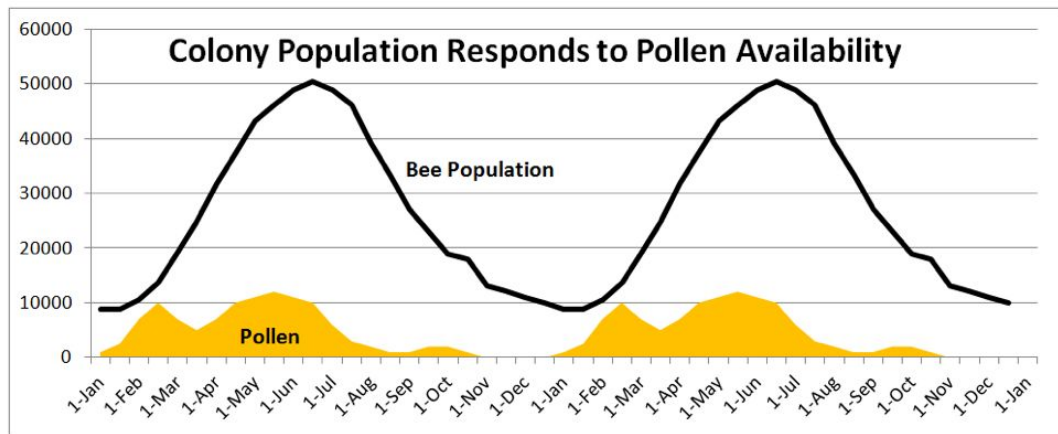
Fact: Chronic exposure to sublethal concentrations directly leads to resistance.

When using ANY treatment: Do not prevaricate. Treat deliberately and FOLLOW THE INSTRUCTIONS!

Nutrition - Protein

Bees are vegetarians!

All their protein comes from pollen!



- The overall size and health of a colony depends on the availability of protein, *especially* for winter population.
- To provide adequate protein for your bees:
 - Plant pollinator-friendly plants and trees (white pine is low in protein!)
 - Avoid over-populating your apiary
 - Provide supplemental pollen or pollen substitute in the spring and during the summer dearth (July - mid-Aug)



Nutrition - Carbs



- Bees rely on nectar for:
 - Fuel - foraging & maintaining the colony
 - Surviving winter and the long months without nectar
 - Building wax comb - the most precious resource in the hive
- In southern Maine, the main nectar flow is ~May 15 → July 4
 - Secondary “Fall” flow is mid-August → Sept 21
- When harvesting honey, 100+ lbs should be left on each colony to survive winter.
- Supplemental feeding may still be needed depending on severity of winter. (Warmer weather actually requires MORE honey!)
- Most colonies that starve, starve in late winter / early spring.
- **Be careful not to start a robbing frenzy when feeding!**



Queens

- A newly mated queen can lay 1500 eggs per day (or more!)
- A typical forager (worker) bee lives <6 weeks.
- (Winter bees (raised in August) live ~8 months)
- Queens can live 4+ years, but after year 2 most queens lay at a lower rate.
- A vigorously laying queen is essential to healthy turnover of hive population and continual supply of healthy worker bees.
- Involuntary retirement...



The First & Second Laws of Beekeeping

1st Law: For every beekeeping idea, there exists an equal but opposing idea.

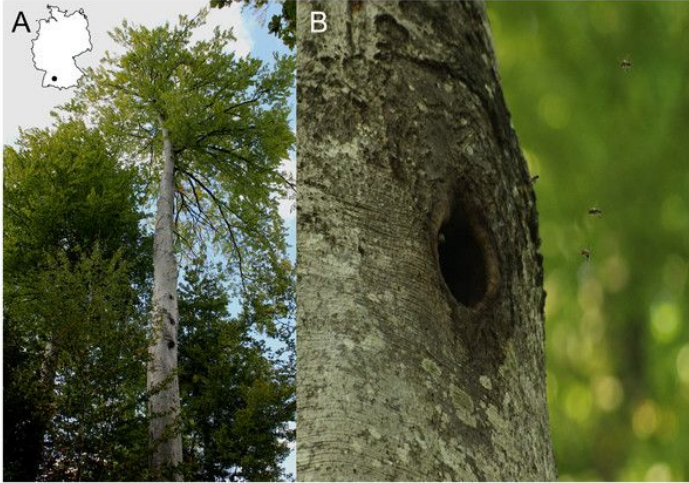
2nd Law: They're both wrong.

Colloquially: Ask 3 beekeepers, get 6 answers.

Moral:

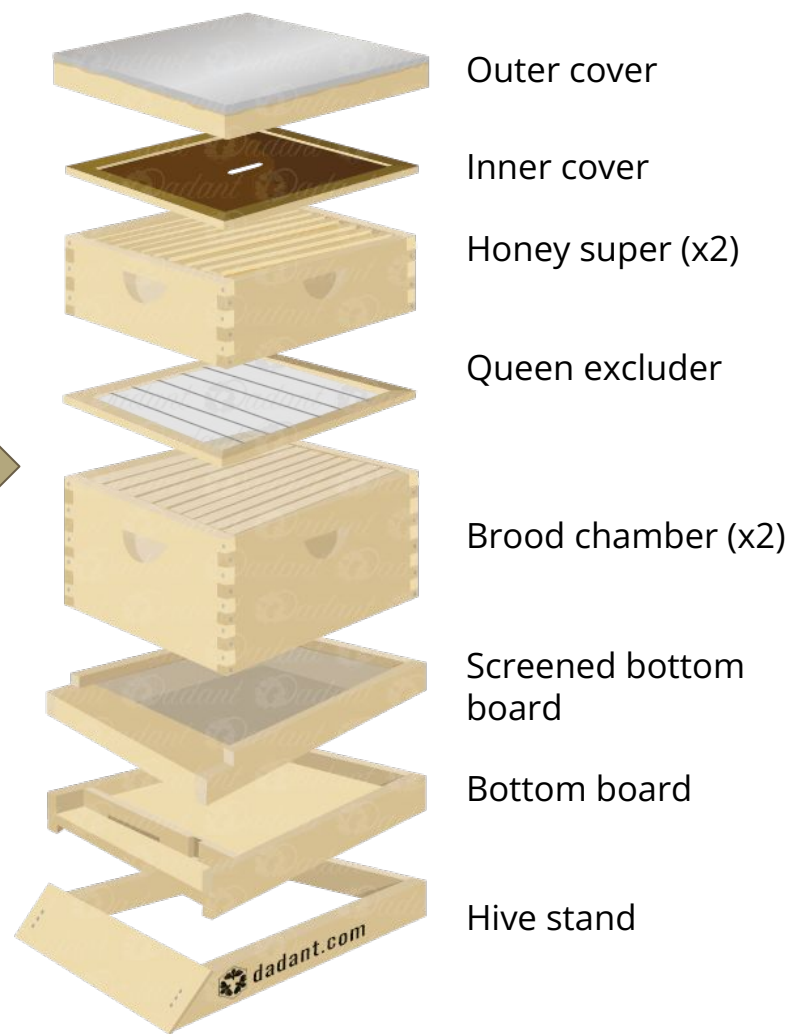
Learn as much as you can, and figure out what works for YOU & your BEES!

Providing a home

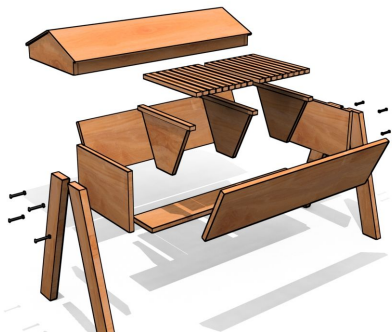


Bees prefer a dry cavity ~10 gals in volume, protected from predators (bears, skunks, mice, people, etc.)

L.L. Langstroth
(~1851)



Alternatives to conventional Langstroth hive



“Top bar hive” advantages:

- **No lifting**
- No extra parts (e.g. supers) to store
- Pretty easy to manage
- Cheap



“Long Langstroth” (“horizontal hive”) advantages:

- All the benefits of a top bar hive
- Uses standard frames - even easier to manage & integrates with conventional apiary (e.g. purchased nucs, frames, frame feeders, excluders, etc.)
- Flexible!

Surviving Winter

In June & July, manage for healthy, adequately nourished colony with low mite counts going into August (when the colony begins rearing winter bees).

Remove supers & treat for mites (Labor Day)

Feed heavy sugar syrup (2:1)

Install mouse guards, entrance reducers end Sept. (end goldenrod)

Block screened bottom board

Replace inner cover with quilt box (or replace outer cover with 2" foam board)

Wrap in tar paper (reduce draft)

Use mild days in Jan, Feb & March to check for adequate honey stores.



Where to put your hive(s)

Protected from wind

Protected from bears, skunks, people, etc.

Entrance faces South

Easy access to the rear/sides of the hive

Allow at least an acre per hive for forage

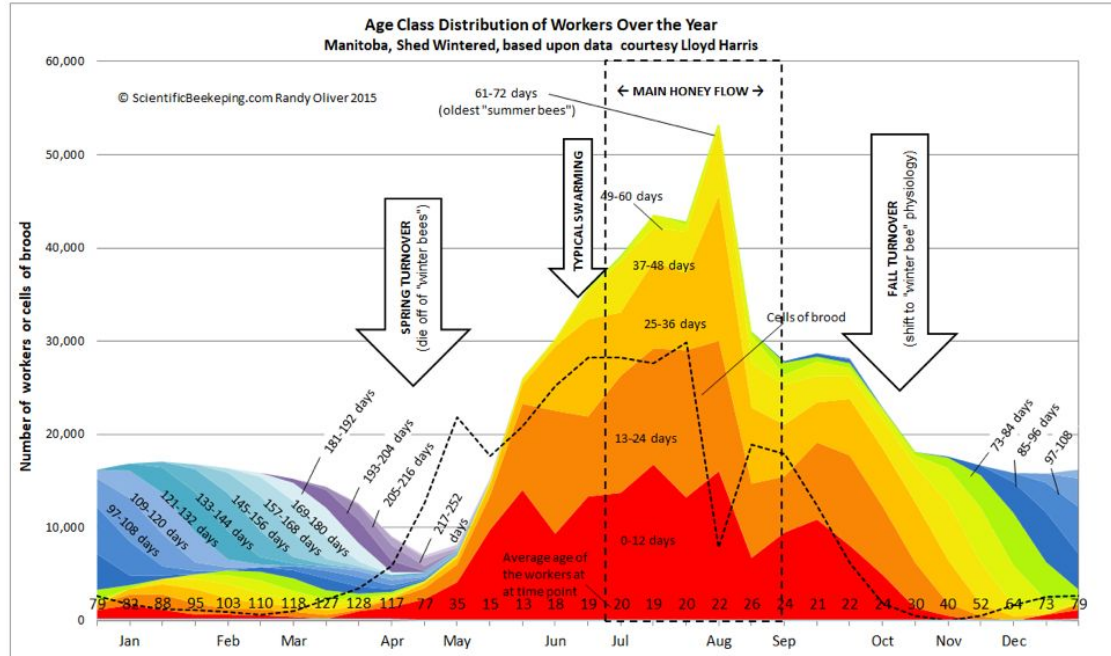
Check your town/city ordinances, home-owner's association, etc!

Working with Bees

- Think like a bee
 - When are you most likely to welcome an uninvited guest?
 - When is it time to look for a new home?
 - How (and what) do you communicate with other bees?
- Act like a bee
 - Not, for example, a bear
- Have a plan & stick to it
 - When opening the hive...
 - When planning the season
- You will get stung
 - But only when you deserve it
 - Most people get used to it anyway (reduced inflammatory response)

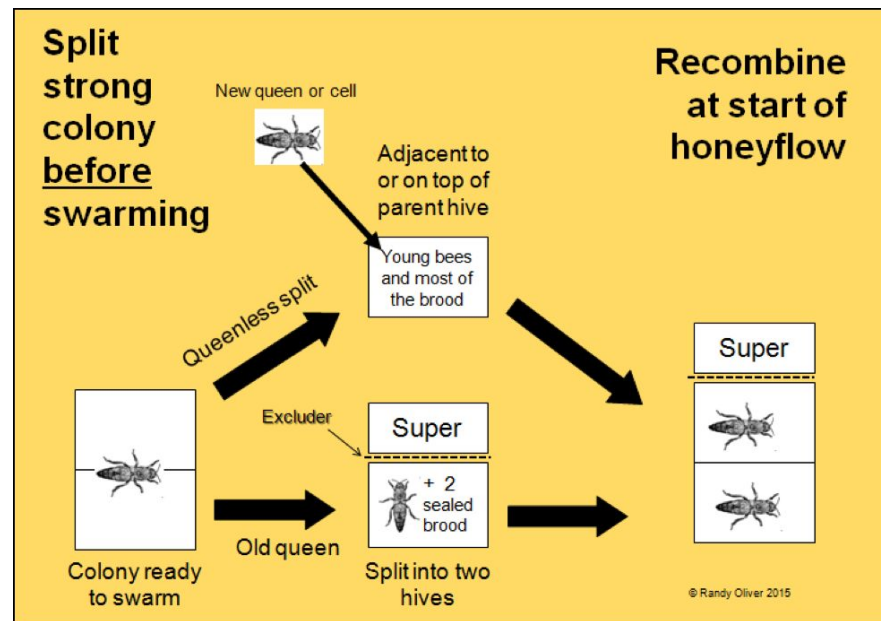
Being a good neighbor - Swarming

Congratulations! You are doing everything right, *except* managing for adequate space!



Preventing swarming

- Purchase or select for genetics less prone to swarming
- Provide space for the queen to lay during spring build-up (April & May)
 - Insert drawn comb (NOT foundation) into the brood nest a frame at a time, or...
 - Split the brood next into 2 hives if the weather is warm (or use a double screen ("Snellgrove") board), or...
 - Remove frames of brood from strong colonies and donate to weaker colonies
- Swarm cells make the best queens, but...
- Once the swarm impulse starts, it can only be stopped by separating all swarm cells and the queen.
- If you see capped swarm cells, your hive will swarm within hours unless you intervene drastically (e.g. shook/simulated swarm).



Being a good neighbor - Managing Disease

Bees fly up to 6 miles, giving you the opportunity to spread “the wealth” to any beekeepers within a 6 mile radius.

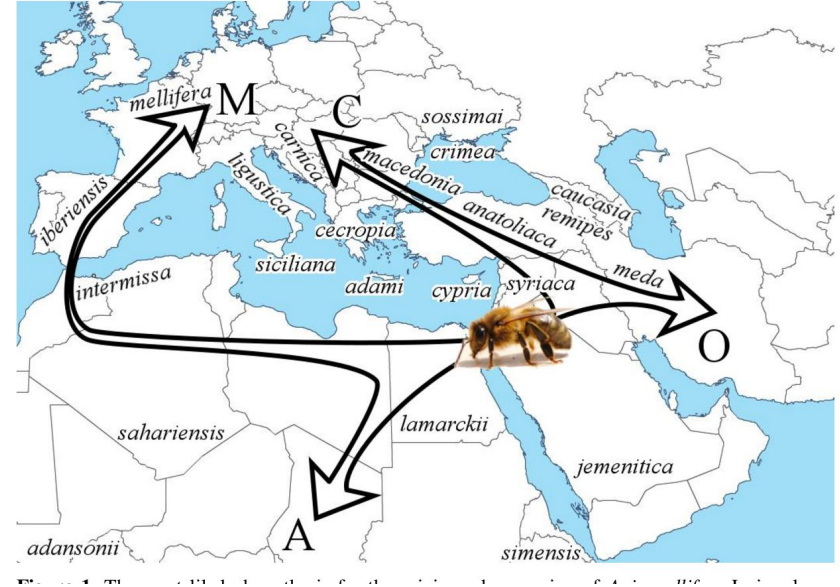
Please PLEASE **PLEASE** treat for mites!

Being a good neighbor - aggressive bees

Aggression, honey production & disease resistance are genetic traits actively manipulated in commercial breeding programs.

The queen carries the genetics and determines the overall characteristics of the colony.

If you have an aggressive hive, you can always buy a new queen. Just sayin'...



Practical tips

Where to SAVE money

- Specialized equipment (e.g. hive accessories, expensive suits, smoker fuel,...)
- Replacing your bees every year!

Where to SPEND money

- Good quality frames (Mann Lake, Dadant, BetterBee, ...)
- A good smoker (Dadant)
- Decent woodenware (Mann Lake)
- Spare woodenware (are you ready for a swarm / split? A strong flow?)
- Educating yourself

Some useful resources

- York County Beekeeper's Association
 - <https://yorkcountybeekeepers.mainebeekeepers.org/>
- Bee Culture & American Bee Journal
- Honey Bee Research Center, University of Guelph (<https://hbrc.ca/>)
 - Comprehensive set of short videos, Northern climate
- ScientificBeekeeping.com, Randy Oliver
- Rusty Burlew, Honey Bee Suite (<https://www.honeybeesuite.com/>)
- Kamon Reynolds, Tennessee's Bees, YouTube channel
 - Great alternative to NetFlix, super informative
- Michael Bush, "The Practical Beekeeper", <https://www.bushfarms.com/bees.htm>
- Tom Seeley, Cornell University
 - *The Lives of Bees*, *Honeybee Democracy*
- *Honey Bee Biology and Beekeeping*, Dewey Caron

