

# **An Introduction to Beekeeping**

## **A Very Broad Overview of Beekeeping**

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# The Agenda

Overview of Beekeeping  
Understanding Bees  
Diseases and Pests  
Overview of Your First Year of Beekeeping  
Q & A  
Beekeeping Equipment  
Decisions – Decisions...  
Summary  
Resources

# What is a Beekeeper or Beekeeping?



“The modern beekeeper has not changed his methods to  
manipulate them for profitability and pleasure.”

Honey Bees Biology and Beekeeping, Dewey M Caron, 2nd Edition, 2008

Stewardship





# Why Keep Bees?

Pollination

Honey

Apitherapy

Interested in Bees

Keeping Bees is Cool

Save the World from a Food

Sell Brood and Larvae to the



# Basic Terminology

BEE: Honey Bee \**Apis mellifera* (European Honey Bee)

COLONY: A super organism composed of the queen, worker and drone bees with developing bees living together as a single unit.

HIVE: A structure where bees live (tree, skep, walls, box)

SWARM: A natural method of colony propagation where about half of the bees and a queen leave the parent colony to start a new colony

# Basic Terminology

**CELLS:** The hexagonal compartment of comb.

**COMB (Drawn Comb):** The wax structure composed of cells within a colony in which eggs are laid and honey and pollen are stored

**BROOD:** Immature bees that have not emerged from their cells.

Includes eggs, larvae and pupae

**LARVA:** The stage of the developing bee between the egg and developed young adult bee

**BEE SPACE:** A space about  $\frac{3}{8}$ " that the bees use for passage between combs



# Basic Terminology

**PROPOLIS:** A sticky substance that bees use to encapsulate and plug cracks

**FORAGE:** The food source of bees usually flowers or the act of gathering food.

**PERMONE:** A substance secreted by various glands that act as a chemical signal that triggers behavioral responses or other activities

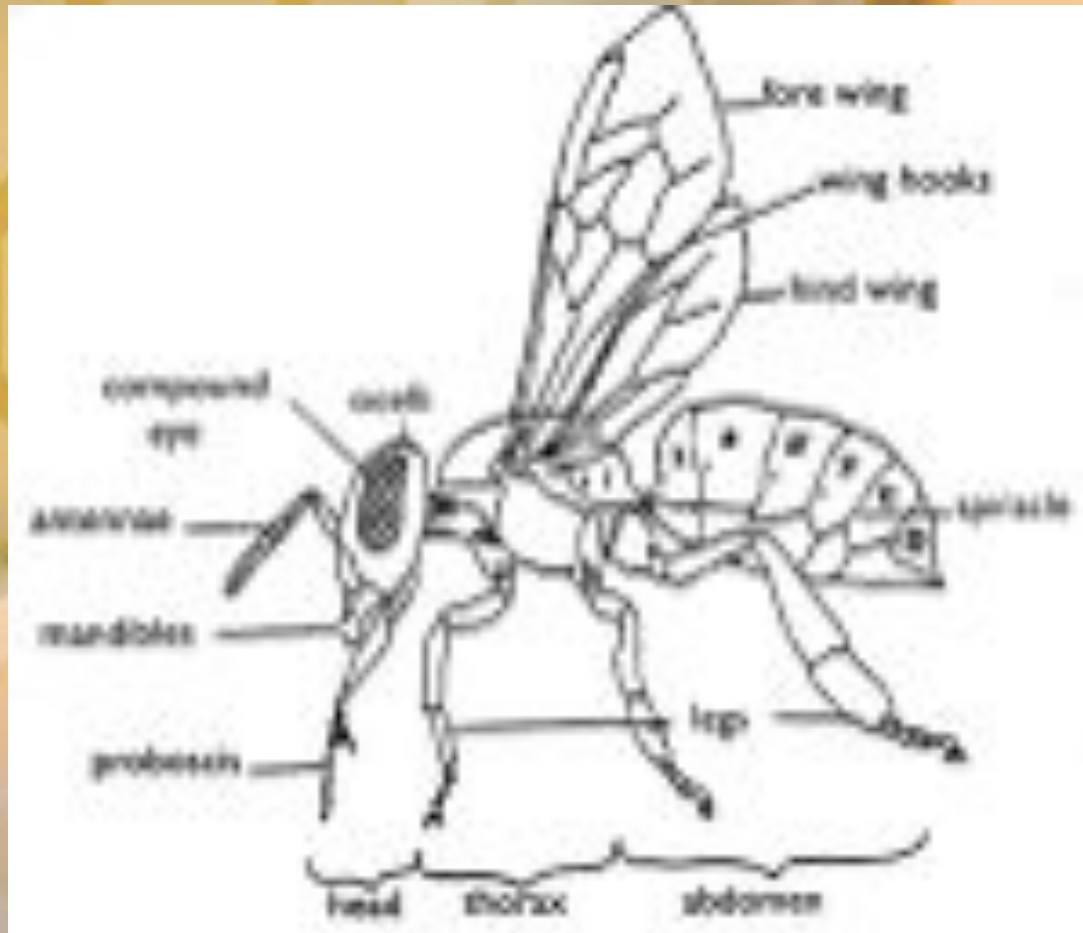
**NUCLEUS COLONIES (Nucs or Nooks):** A 4 or 5 frame starter colony with a queen, bees and brood.

For more definitions and acronyms see:

<http://www.bushfarms.com/beesterms.htm>

# Understanding Bees

## External Anatomy of a Worker Bee





# Understanding Bees

Races of Bees (our honey bees are *Apis mellifera*)

German or Black (*Apis mellifera mellifera*) (1622 in US)

Italian (*Apis mellifera lingustica*) (1859)

Originated in the “boot” in Italy

Carniolan (*Apis mellifera carnica*) (1883)

Originated Yugoslavia/Austria

Caucasian (*Apis mellifera caucasica*) (1905)

Originated valleys of central Caucasus near the Black Sea

Africanized (“Killer bees”) *Apis mellifera scutellata*)

Originated in Africa to Brazil (1950’s) and migrated to the USA (1990)

Hybrid Lines

Russian (1995 in US)

From northeastern Russia (*Varroa* tolerant)

Buckfast

A hybrid from Brother Adam, Buckfast Abby, UK

# Understanding Bees

## Other Races of Bees





# Understanding Bees

Worker  
Drone  
Queen



Worker Drone Queen



Queen



Drone



Workers



# Understanding Bees

## Characteristics of the Worker Bees

Infertile diploid females

Largest population in the colony (40,000-60,000 or more during the summer)

Possesses a stinger

Work performed is age specific

- Cleaning Cells

- Building comb and wax production

- Caring for the brood

- Capping brood

- Tending and feeding the queen

- Receiving, storing nectar and converting to honey

- Cleaning the hive and removing dead bees

- Guarding the hive

- Forging for pollen, nectar, water and propolis

- Lives about 45 days in the summer

- Initiates production of new queens



# Understanding Bees

## Characteristics of the Queen Bee

Fertile diploid female

Inseminated by 10 or more drones during the mating flight

Lays up to 2000 eggs per day

Can live up to 3 years or more

Must be fed by workers in her retinue of workers

Feed a special diet of royal jelly

Responsible for the genetic traits of the colony





# Understanding Bees

## Characteristics of Drone Bees

Fertile haploid male

Large eyes and flight muscles

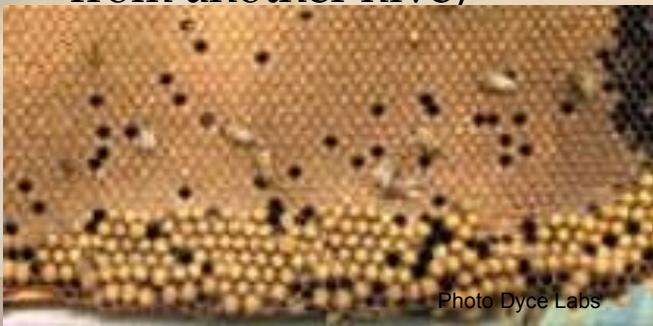
Several hundred to a few thousand in a colony - about 15%

Do not possess a stinger

Do not collect pollen, nectar

Do not feed the young bees

The only confirmed function is to mate with a new queen (usually from another hive)



from the hi





# Understanding Bees

Organizational Summary of the Hive



# Diseases and Pests

## Diseases

American Foul Brood (AFB)

European Foul Brood (EFB)

Nosema (N. apis 1909 & N. ceranae 1995? 2006)

Various Viruses (post 1987)

## Pests

Varroa Mite (Varroa destructor) (1987)

Tracheal Mite (1984)

Small Hive Beetle (1996)

Wax Moths (1806)

Bears

Mice and Skunks and others

## Insecticides



# Diseases and Pests

Diseases

AFB

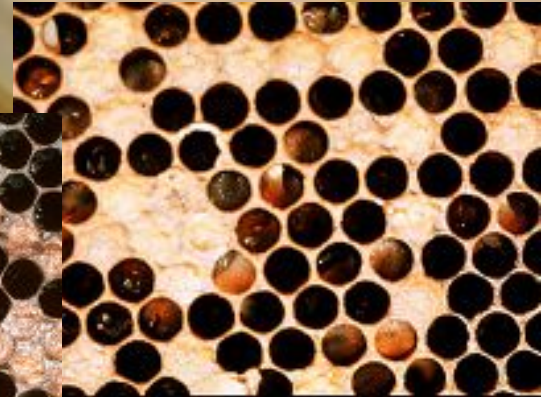
EFB

Nosema

Various Viruses



American Foul Brood (AFB)



European Foul Brood (EFB)



Nosema

Varroa destructor)

Small Hive Beetle

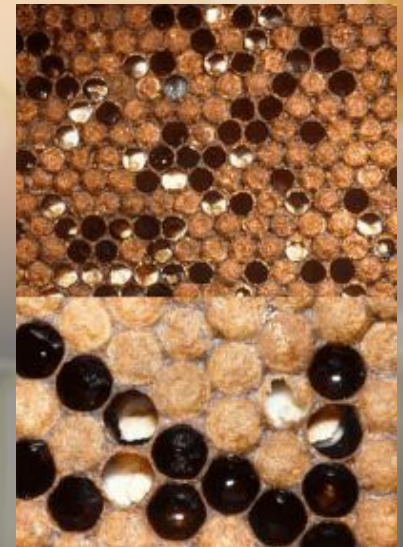
Wax Moths



Nosema Apis



Deformed Wing Virus (DWV)



Chalk Brood (CB)



# Diseases and Pests

## Diseases

AFB

EFB

Nosema

Various

## Pests

Varroa Mite (*Varroa destructor*)(1987)

Tracheal Mite (1983)

Small Hive Beetle (1997)

Wax Moths

Bears

Mice

Skunks

## Insecticides





# Diseases and Pests

Bears





# Diseases and Pests

Consider an Electric Bear Fence if in bear country

At least 8kv (8,000 volts) – (10,000 volts is better)

At least 1 Joule

<http://www.tc.umn.edu/~reute001/pdf-files/bear%20fence.pdf>

<http://www.premier1supplies.com>



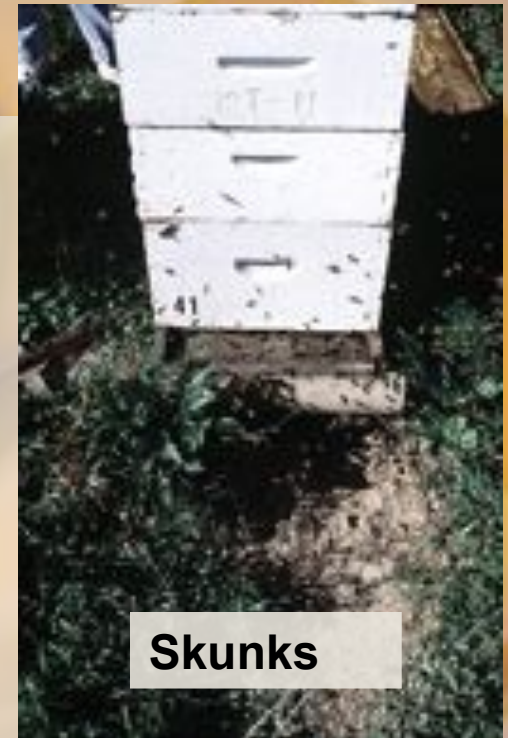


# Diseases and Pests

Mice  
Skunks  
Ants



**Mice Damage**



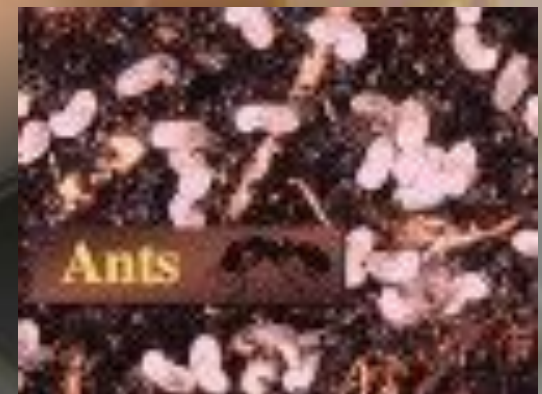
**Skunks**



**Mice**



**Mouse Guard**



**Ants**

# Diseases and Pests

## Insecticides

Insecticides Kill Insects and Bees are an Insect

Agricultural Insecticides

Home Garden Insecticides

Lawn Care Insecticides

Use all only as per the label directions

Do not use when plants are in flower



Source: Google Images



# Diseases and Pests

## Varroa (Revisited)

Noted in the US in 1986-1987

Essentially everywhere in the US and most of the world

A vector of multiple diseases and viruses!!!!

Transmits viruses and causes weakening of colony and eventually dwindling and colony failure

Reproduces in brood and feeds on the larvae and adult bees

Colony must be managed for Varroa



# Overview of Your First Year of Beekeeping

January (that's today...)

- Plan for the next season (this year)

- Order Bees (if from southern suppliers they sell out early)

- Order equipment and supplies / feed

- Subscribe to a Bee Journal

February

- Assemble Equipment

- Research and read about bees

- Access and select a location for your apiary

March

- Complete getting equipment ready

- Confirm hive location



# Overview of Your First Year of Beekeeping

## April

Set up new equipment

Install bees in new hives

and feed, feed, feed...(1:1; sugar : water) and pollen patty

Check on Queen acceptance and release

and feed, feed, feed...(1:1; sugar : water) and pollen patty

## May

Feed

Check for brood

Ascertain if adding a second hive body is necessary

# Overview of Your First Year of Beekeeping

## June

- Check brood health

- Monitor for Varroa Mite load

- Check brood hives and assess if a honey super is necessary

## July

- Super if necessary

- Check for brood and overall colony health

- Pull honey supers and extract

## August

- Check for Varroa mite load

- Treat for mites if necessary

- Feed if there is not a honey flow (1:1; sugar : water)



# Overview of Your First Year of Beekeeping

## September

Super for fall flow

Pull supers and extract

Final fall mite/nosema, etc. treatment

Install mouse guards

Feed for winter stores (2:1; sugar : water) (no pollen patty)

Terminate dinks ( combine with other colonies)

## October

Feed for winter stores (2:1 sugar : water)

Pull feeders

Winterize/wrap colonies

# Overview of Your First Year of Beekeeping

## November

Check hives (knock on side and listen)

De-energize bear fence (at end of month)

## December

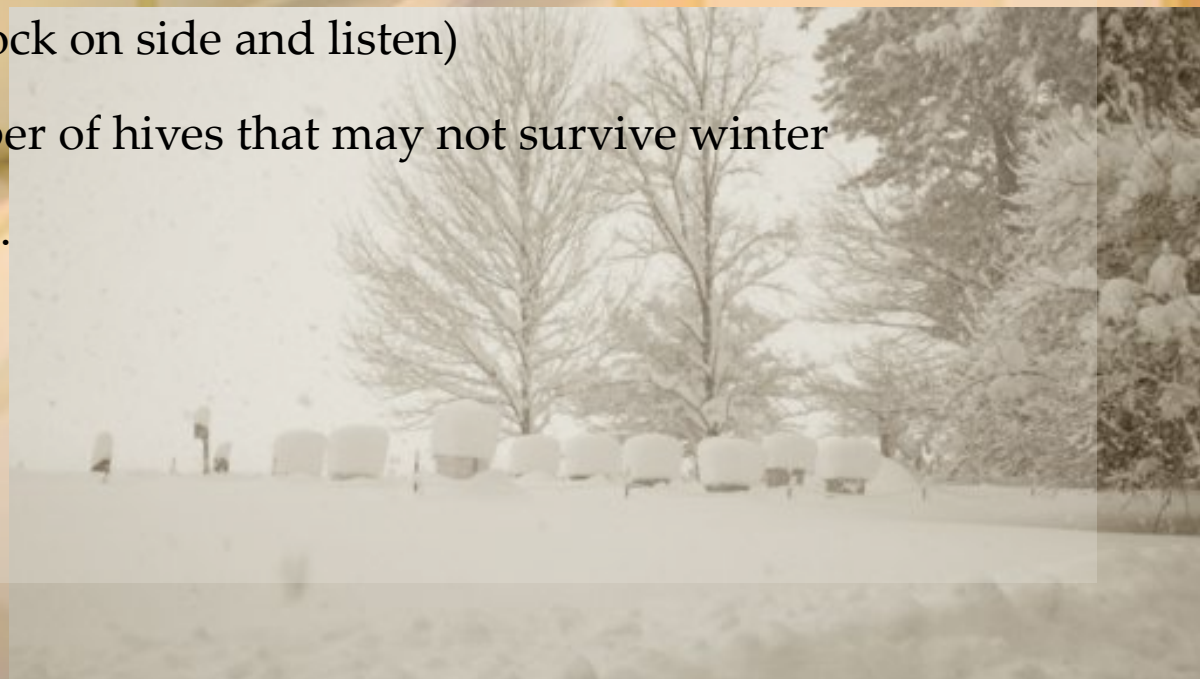
Check hives (knock on side and listen)

Access the number of hives that may not survive winter

Hope and Wait...

## January

A new year....





# Deep Breath

Q & A



# Beekeeping Equipment

## Bee Hives

Skep  
Log Gum  
Warré  
(Kenya) Top Bar  
Langstroth



Only removable frame  
hives are legal in NYS





# Beekeeping Equipment

## Bee Hives

- Contemporary Beehive

Click to edit Master text styles

Second level

Third level

Fourth level

Fifth level



# Bee Keeping Equipment Hive Components

1. Telescoping Cover
2. Inner Cover
3. Shallow Super
4. Medium (Illinois) Super
5. Queen Excluder
6. Hive Body (Deep Super)
7. Frames (w/o foundation)
8. Bottom Board (screened)
9. Landing Board or Hive Stand



Source: Brush Mountain Bee Farm



# Beekeeping Equipment Feeders

Types of Feeders  
Entrance Feeders

Boardman Type Feeders

Internal Feeders

Division Board Feeders

Top Feeders



# Beekeeping Equipment

## Protective Clothing

Veil / Helmets

Coveralls / Bee suits / Jackets

Gloves

## Important Tools

Smoker and Fuel

Hive Tool

Bee Brush

## Other Useful Tools

Frame Grip

Capping Scratcher



# Beekeeping Equipment

Protective Clothing  
Veil / Helmets



Coveralls / Bee Suits / Jackets

Gloves

Important Tools  
Smoker

Hive

Bee

Other Us  
Fram

Capping Scratcher



# Beekeeping Equipment

Protective Clothing  
Veil / Helmets

Coveralls / Bee suits

Gloves



Important Tools  
Smoker and Fuel

Hive Tool

Bee Brush



Other Useful Tools  
Frame Grip

Capping Scratcher





# Beekeeping Equipment

Protective Clothing  
The Full Bee Suit



# Decisions / Decisions

Type of Hive

8 Frame or 10 Frame Equipment

Deep Brood Chambers or Medium Brood Chambers

Type or Frame and Foundation

Type of Feeder

Package Bees or Nucs

Apiary Location

One Colony or Two or more



# Decisions / Decisions

Type of Hive

Only removable frame hives in NYS

Warré

Top Bar

Langstroth



# Decisions / Decisions

## 8 Frame v. 10 Frame Equipment

### Comparison of the Weight of Equipment

8 frame equipment is about 20% lighter than 10 frame equipment

8 Frame	Item	10 Frame
64-72#	9-5/8" Deep (full)	80-90#
48-55#	6-5/8" Medium (full)	60-70#
40-48#	5-3/4" Shallow (full)	50-60#
Bees seem to draw and use the outside frames better in 8 frame equipment		





# Decisions / Decisions

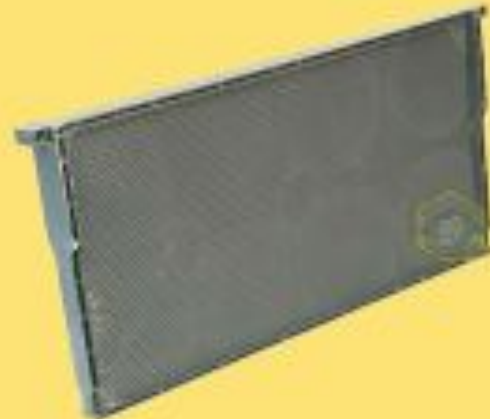
Deeps v. Mediums for Brood Chambers

<b>9-5/8" Deep</b>	<b>6-5/8" Medium (are kids helping)</b>
Each box is heavier both empty and full than 8 frame	Lighter, easier to handle, easier on your back
2 Deeps for brood chamber and winter stores	3 Mediums for brood chamber and winter stores
Larger continuous surface area on frame but less opportunity to move laterally	Smaller continuous surface area on frame but more opportunity to move laterally
Different brood box and frames and honey super and frames size. Cannot interchange brood box/frames with honey box/frames	One size brood box and frame and honey super and frame. Interchangeable between brood box/frames and honey supers/frames
Cost is less for brood area (2 boxes with frames v 3) (\$81+/-)	Cost (slightly) more for brood area (2 boxes with frames v 3) (\$100+/-)

# Decisions / Decisions

Wood Frames v. Plastic Frame/Foundation

Wood Frames	Plastic Frames / Foundation
<p>Traditional</p> <p>Bees draw comb on wood frames with wax or plastic foundation better than plastic frames/plastic foundation</p> <p>Some assembly needed (maybe)</p>	<p>Bees draw comb slowest of any other combination</p> <p>One piece take out of box and install</p> <p>More expensive that wood frames and other foundation</p>





# Decisions / Decisions




Plastic Foundation v. Wax Foundation

Plastic Foundation	Wax Foundation
Durable	Not (as) durable as plastic
Easy and quick to install	More difficult and more time to install
Easily cleaned to reuse	Requires additional wiring for reinforcement
Bees are slow to draw comb compared to wax but faster than 1 piece plastic	Bee draw comb faster than plastic



# Decisions / Decisions

Package v. Nucs

Package	Nucleus Colony (Nucs)
Cost \$80 – \$100 +/- ?	Cost \$100 -\$130+/-?
Queen is not laying and cannot lay until bees draw out comb on foundation (unless you have drawn comb available).	Queen already laying with capped brood and 5 frames of comb.
	
	



# Decisions / Decisions

Apiary Location

Good location

Wind break

Full sun

Good access

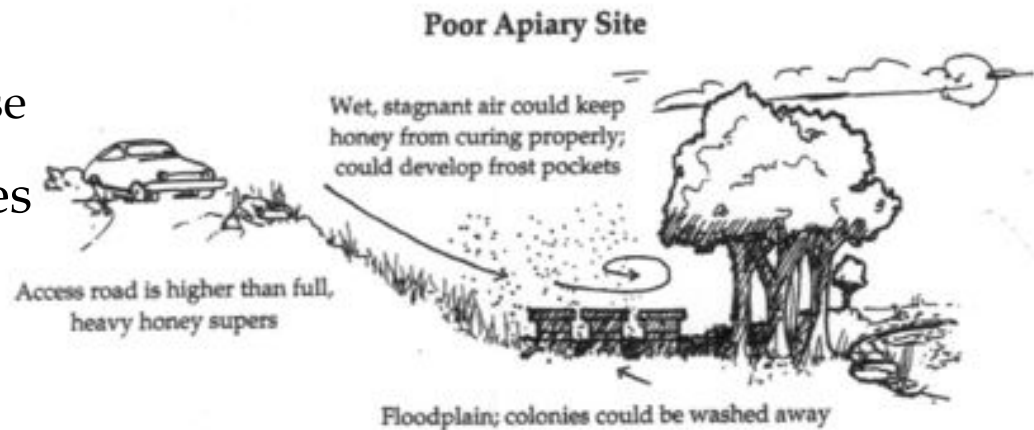
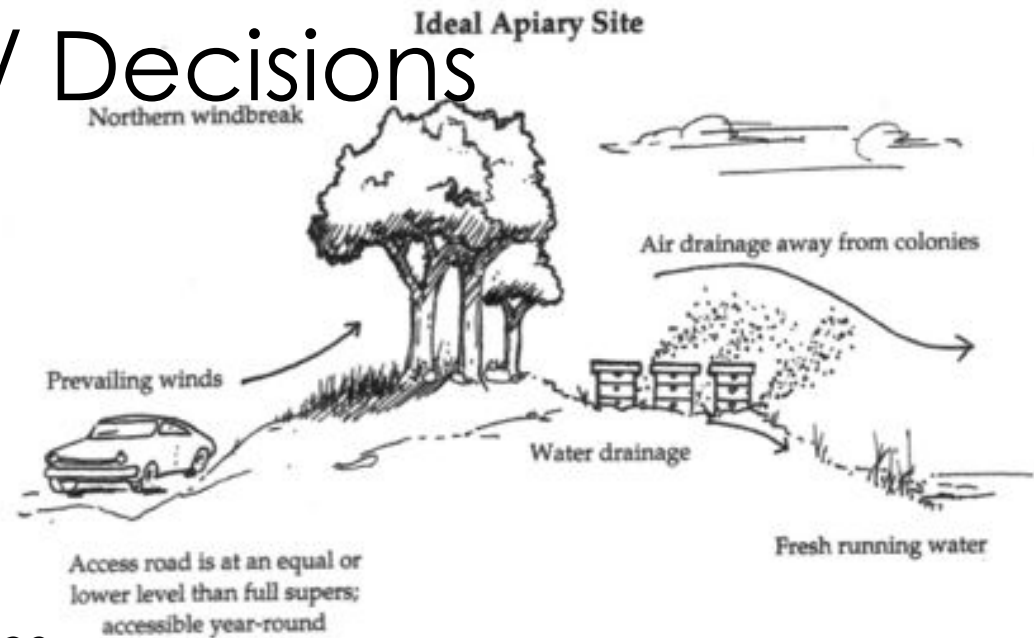
Good air drainage

Good Water drainage

Good forage

Note insecticide use

within 3 miles



Drawing by J. Propst

Source: The Beekeeper's Handbook by Sammataro and Avitabile

# Decisions / Decisions

Good Location

Sunny Location

Adequate wind break

Good air drainage

Good water drainage

Access road near and not uphill





# Decisions / Decisions

Bad Location  
Too much shade  
for too long



# Decisions / Decisions

One Hive  
or Two (recommended)  
Or....



PHOTO BEE CULTURE MAGAZINE



# Decisions / Decisions

One Hive or Two



# Costs

**Hive Setup Complete** – \$195 - \$270

**Protective Clothing** – \$90 - \$125

Bee Suit / Jacket / Veil – \$70 - \$100

Gloves – \$20 - \$25

**Tools** – \$45 - \$60

Smoker – \$35

Hive Tool – \$4 - \$7

Bee Brush – \$5

**Bees**

Package – \$80 - \$100 +/-

Nuc - \$120 +/-

**Do NOT buy used wooden ware**

**\$360 +/- unpainted and unassembled \***

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Second level Click to edit Master text styles

Third level Second level

Fourth level Third level

Fifth level Fourth level

Fifth level



Source: Mann Lake Catalog



# The Rewards

Interacting with Nature  
Bonding and Sharing  
Expanding your Horizon





# The Rewards

and Sweet Success





# Take-Away Messages

There are Two Type of People Keeping Bees  
BeeHavers

- Own Bees and usually watch them dwindle

- Do not take the time to manage their colonies

- Replace most or all of the bees every year

BeeKeepers

- Periodic inspection of the colonies

- Manage hives

- Use various techniques to keep bees healthy

Keeping Bees as a Beekeeper requires Commitments:  
Monetary (at least initially)

Time

- Time to Feed

- Time to Monitor

- Time to Manage

- Time to Reap the Rewards

# Take-Away Messages

## Rewards

Ongoing learning (a new adventure Bilbo)

Sharing

Maybe some income

Honey and other Products from the Hive

## Plan Ahead

If you are going to become a beekeeper in 2013, you need to order your bees early in January. Most suppliers are in the south and also sell to southern beekeepers. They are about 2 months ahead of us here. They will be sold out early.

Order your equipment then and don't procrastinate in getting it ready

The hives must be ready for the bees BEFORE they arrive. Arrange for a mid April or very early May delivery



# Equipment Suppliers

Brushy Mountain Bee Farm

<http://www.brushymountainbeefarm.com/>

Dadant and Son

<https://www.dadant.com/>

Mann Lake Ltd

<http://www.mannlakeltd.com/>

Walter T Kelly

<https://kelleybees.com/>

Blue Sky Bee Supply

<http://blueskybeesupply.com/>

There are others...Check the Bee Magazines

# Bee Suppliers

**Local** (probably will not be available until mid/late May. Contact supplier for availability)

Jim Walker, Forestville, NY (not local bees)

Package Bees (usually southern Italians)

Nucs (usually southern Italians)

Available about April 16, 2013 at Walker's Fruit Farm, Rt. 39

716.673.5260

Bob Brachman, Little Valley, NY

Russian Bees (Queens, Nucs)

716.699.4145

<http://www.coldcountryqueens.com/>

Kale Luce, Allegany Mountain Bee Farm, Cattaraugus, NY

Queens, Nucs

716.969.1046

[kale275@yahoo.com](mailto:kale275@yahoo.com)



# Bee Suppliers

Mail Order (may be available in mid-late April)

Draper Super Bee Apiaries

<http://www.draperbee.com/>

Rossman Apiaries

<http://www.gabees.com/>

R Weaver Apiaries

<http://www.rweaver.com/>

**\*\*Check out the ads in American Bee Journal Magazine, Bee Culture Magazine or in any of the Bee Supply Catalogs for other package suppliers**

# Resources

## Books

The Beekeeper's Handbook

by Dianne Sammataro / Alphonse Avitabile

The Backyard Beekeeper by Kim Flottum

First Lesson in Beekeeping by Keith S. Delaplane

Hive and the Honey Bee by Dadant and Son

ABC & XYZ of Bee Culture by A. I. Root Publications

## Periodicals

*Bee Culture Magazine* published by A.I. Root Co.

*American Bee Journal* published by Dadant and Son



# Resources

## Web Sites (Webinars and Instruction)

Ohio State Beekeepers Association

[http://www.ohiostatebeekeepers.org/beekeeping\\_class/](http://www.ohiostatebeekeepers.org/beekeeping_class/)

This is GREAT tutorial in Beekeeping in small bites

Ohio State University

<http://beelab.osu.edu/>

Very good Webinars (subscribe for notifications)

Brushy Mountain Bee Farm

<http://www.brushymountainbeefarm.com/Resources/Videos.asp>

Very good Webinars (can subscribe for notifications)

University of Minnesota

<http://www.beelab.umn.edu/index.htm>

# Resources

## Web Sites

**NY Bee Wellness Workshops** (Empire State Honey Producers Assoc.)

<http://nybeewellness.com/>

**Scientific Beekeeping** – Randy Oliver

<http://scientificbeekeeping.com/>

**Bee-L** ( an informed discussion of Beekeeping)

<http://community.lsoft.com/scripts/wa->

[LSOFTDONATIONS.exe?A0=BEE-L](http://community.lsoft.com/scripts/wa-LSOFTDONATIONS.exe?A0=BEE-L)

**Bush Farms** - Michael Bush (Practical Beekeeping)

<http://www.bushfarms.com/bees.htm>

**Bee Lab** (Ohio State University)

<http://beelab.osu.edu/>

**Bee Source** (use with some skepticism)

<http://www.beesource.com/>



# Resources

## Organizations

Chautauqua County Beekeepers Association

Frank Bratt Ag Center, Jamestown NY

Laura LaMonica   lauralwells56@gmail.com (contact person)

WNY Honey Producers Association

East Aurora, NY

<http://www.wnyhpa.org/>

Empire State Honey Producers Association

<http://www.eshpa.org/>

# Fun Facts

Bees fly at 9-15 MPH

Bees must visit about 2 million flowers to make 1- pound of honey

In her lifetime, a bee produces about 1/12th of a teaspoon of honey

A worker bee lives about 30-40 days in the summer

In a normal hive at the height of the season:

- 300-1000 Drones

- 25,000 Older Forager Bees

- 25,000 Young House Bees

- 9000 Uncapped Larvae

- 6000 Eggs

- 20,000 Capped Brood

- 1 Queen

Source: The Beekeeper's Handbook by Sammataro and Avitabile



# Questions and Comments

Next Time

## **Beginning Beekeeping**

A First Course in Keeping Bees

the end

