

# BEEKEEPING EQUIPMENT

Apprentice Level Training  
Texas Master Beekeeper Program



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## Introduction

- In beekeeping, like any other industry, there are many specialized pieces of equipment used.
- As you might imagine, this means that the industry is full of jargon.



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## The Hive

- The modern US design is based on Langstroth's original hive
  - Developed in the 1800's by Rev. L. L. Langstroth
- The hives have removable frames
- Provides bee space between frames and other parts of the hive of  $\frac{3}{8}$  inch.
- The design allows a comb to be unharmed when frames are removed.



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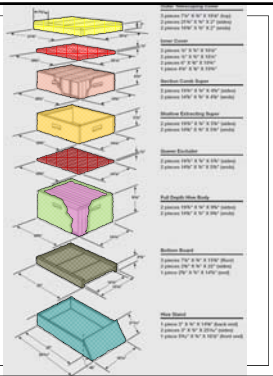
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## The Hive

- Modern hives have standardized dimensions to allow equipment to be interchangeable.
- Usually constructed from wood.
- Other materials used include Styrofoam and plastic
- The basic hive components are:
  - "boxes"
  - A bottom board
  - Foundation and removable frames
  - Some type of cover




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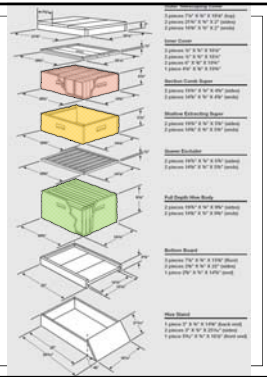
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## The "Boxes"

- The boxes have many names. They most commonly are called "supers" though some beekeepers call them "boxes".
- There are 3 depths (heights) of supers:
  1. Shallow super
  2. Medium (or Illinois) super (not shown)
  3. Deep super
- Supers may be called by what they contain:
  1. Honey super (super used to collect honey)
  2. Brood super or brood "chamber" (super where queen lays eggs and where young are reared)




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## The Hive



Wooden Hive  
Styrofoam Hive

Plastic bee colonies also are available!

Medium Super →  
Deep Super →




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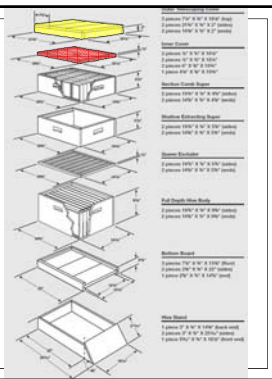
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## Hive Covers

- Covers (or lids) sit on top of the hive.
- They are removed easily to allow access to the frames.
- Hive covers provide protection from the elements.
- There are 2 main types (with variations of both):
  1. Telescoping outer cover with inner cover
  2. Migratory cover




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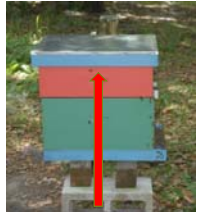
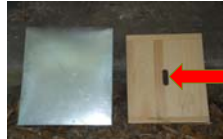
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## Telescoping outer cover with inner cover

- A two piece cover consisting of a metal cover which fits over the box and a wooden inner cover.
- Inner covers have holes in the middle to accommodate a Porter bee escape.



The outer cover has a lip which 'telescopes' over the box

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## Migratory Covers

- Flat lid with flush sides.
- Used when moving bees to accommodate more hives on pallets.
- Can have a hole in the center to accommodate a feeder jar.




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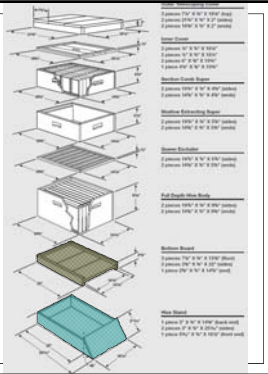
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## Bottom Board

- Sits below the hive bodies. It is the foundation on which the colony rests.
- There are two types:
  1. Standard bottom board
    - Solid bottom helps temperature control in colder climates.
  2. Screen bottom board
    - Wood frame with screen center (8 mesh hardware screen).
    - Recommended for Varroa control and to increase air flow.




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## Bottom Boards



standard bottom board



screened bottom board

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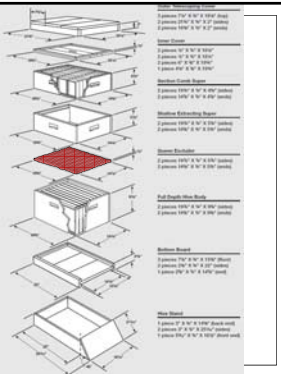
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## Queen Excluder

- Queen excluders are used to isolate the queen from the honey supers.
- They prevent the queen from laying eggs in honey cells.
- There are 3 types
  1. Metal bound
  2. Wood bound
  3. Plastic




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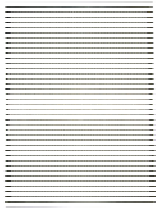
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## Queen Excluders



Metal Bound



Wood Bound



Plastic

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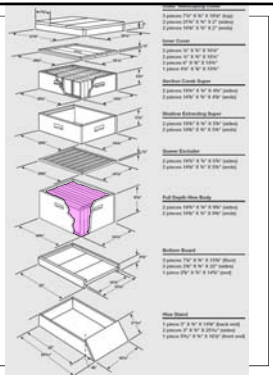
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## Frames

- Frames are the structures that hold the comb.
- They usually are made of wood, though plastic frames are increasingly common.
- There are three depths, made to fit the three sizes of supers:
  1. Deep
  2. Medium (or Illinois)
  3. Shallow




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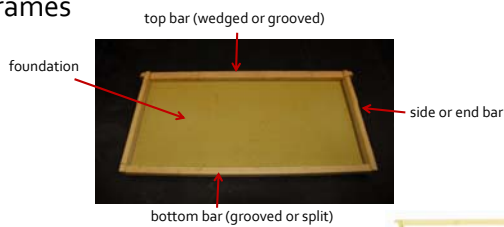
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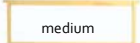
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## Frames



shallow



medium



deep

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## Frames

### Wedge Top Bar

- Has a wedge in the top bar that is nailed into place.
- Used primarily for wax foundation.

### Grooved Top Bar

- Has a groove in the center of the top bar.
- Used primarily for plastic foundation.



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## Foundation

- Foundation is the material provided to bees on which they will build their comb.
- Two basic types: Plastic and Wax
  1. Wax foundation is pure beeswax formed into sheets
  2. Plastic foundation has a plastic core which is usually coated by a thin layer of beeswax.
- Foundation is made for all three sizes of frames.



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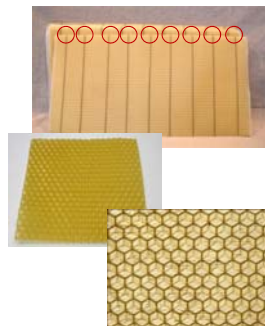
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## Foundation

### Wax Foundation

- Crimped wire
  - Sheet of beeswax with vertical wires embedded to add strength.
  - Hooks at the top fit under the wedge cleat in a frame's top bar.
- Pure beeswax
  - Thick sheet of beeswax.
- Thin surplus
  - Thin sheet of beeswax used to make comb honey.



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## Foundation

### Plastic Foundation

- Plasticell
  - Molded plastic, with or without beeswax coating.
- Duragilt
  - Smooth plastic core coated with beeswax
- Plastic frames and foundation.



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## Types of Hives

- Hive supers are designed to accommodate either 8 or 10 frames (both are considered "full" size colonies).
- Nuc colonies (for "nucleus" colony)
  - Can accommodate 3, 4, or 5 frames
  - Are used to start new colonies or house weak colonies
- Mating nucs are
  - Small colonies
  - Used to mate queens
  - Use specialized frames



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## Hive Feeders

- Feeders are used to deliver sugar solutions to colonies to supplement the bees' diet.
- They are used during low nectar flow or to stimulate colony growth in the spring.
- Three main types:
  1. Hive top feeders
  2. Entrance feeders (boardman)
  3. In-hive feeders (division board)



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## Protective Equipment – Bee Suits

- A bee suit allows you to work around honey bees with minimal stings.
- Bee suits can be made of cotton, polyester, or canvas-type material.
- Today, you can purchase suits that have veils attached to them.
- You can also purchase "half-suits" or jackets that protect the upper half of your body.



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## Protective Equipment – Bee Veils

- Bee veils protect the head and neck area from stings.
- The older veils tie around the body and have helmets.
- More modern veils zip to a suit and have built-in cloth hats.
- Veil types:
  - Round veils
  - Square veils
  - Alexander veils
  - "Sheriff" veils



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## Protective Equipment – Gloves

- Bee gloves protect the hand and forearm area.
- Can be made of leather or rubber.
- Most gloves have ventilation mesh.
- Some people use work gloves.



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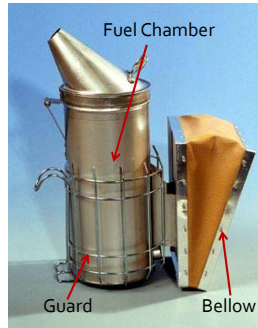
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## Smokers

- Smokers are used to "calm" bees while working colonies.
- Smokers likely work by masking alarm pheromones.
- They consist of a bellow, fuel chamber, and a guard.
- Fuel used in smokers is commonly pine straw, wood pellets, dried grass, etc.



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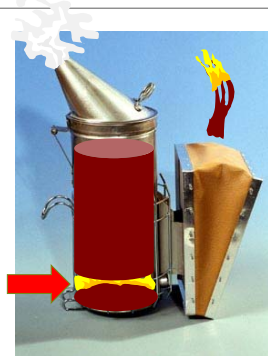
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## Lighting a Smoker

1. Place a small amount of fuel in the bottom of the smoker.
2. Pick up a small amount of fuel and light it.
3. Put the fuel into the smoker and PUFF THE BELLOW!
4. Once fire comes out of the top (watch your hands), lightly pack more fuel into the smoker. PUFF THE BELLOW!
5. Repeat step 4 two times.
6. Once going well, you can pack fuel into the smoker tightly. PUFF THE BELLOW!



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## Hive Tool

- The most used piece of beekeeping equipment.
- Used to separate boxes, remove frames, scraping propolis, and for many other things.



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## Pollen Traps

- Returning foragers pass through a screen which scrapes pollen from their legs.
- Pollen can be collected for:
  - Sale as a dietary supplement
  - Storage for food supplement for bees
  - Research
  - Etc.
- They should not be placed on colonies for long periods of time.



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## Entrance Reducers

- Used to limit the size of the entrance.
- Beneficial for transporting colonies or reducing the entrance on weak colonies (less of an entrance to guard).
- Commonly used in colder climates to minimize drafts of air into the hive during winter.



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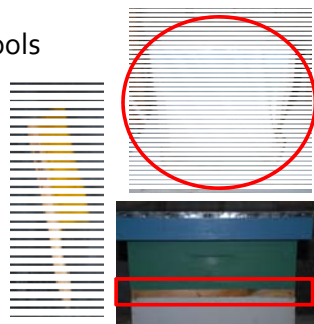
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## Other Beekeeping Tools

- Hive net:
  - Net used to cover hives during transport.
- Bee brush:
  - Brush used to remove bees from frames and other equipment.
- Super spacer:
  - Placed between the brood and honey supers to allow space for pollen patties.



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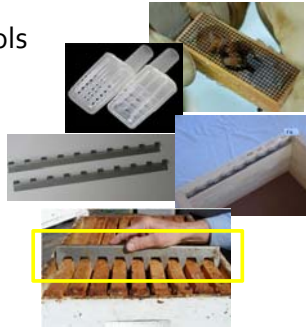
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## Other Beekeeping Tools

- Queen cages:
  - Used to hold queens temporarily or for the transportation of queens.
- Frame spacer:
  - Fit in supers and space frames evenly.
- Comb spacer:
  - Hand-held spacer. Usually made for 9 frames.



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## Other Beekeeping Tools

- Frame grip:
  - Used to remove frames from colonies
- Frame holder:
  - Hold frames outside of the hive while you work with the other frames in the hive.
- Hive lifter:
  - Allows 2 people to carry a colony easily.



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## Other Beekeeping Tools

- Solar Wax Melter:
  - Melts wax. These are helpful when processing old comb, or removing wax off of hard-to-clean equipment (such as queen excluders).
- Ratchet strap:
  - Holds the colony together so that it can be transported.



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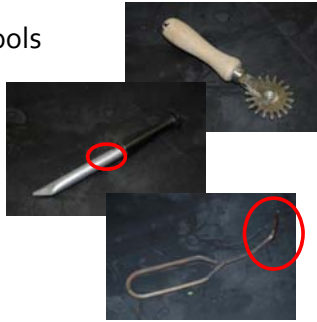
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## Other Beekeeping Tools

- **Spur Wire Embedder:**
  - Used to embed wire into wax foundation.
- **Wax Tube Fastener:**
  - Hollow tube used to dispense wax for fastening wax foundation to frames.
- **Frame Cleaner:**
  - Used to clean the frame grooves when installing new foundation.



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## Entrance Reducers

- **Porter bee escape:**
  - Allows bees to exit hive top with no re-entry
  - Used to remove bees from supers to collect honey.
- **Drone escape:**
  - Allows drones to exit supers



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## Honey Extraction

- **Uncapping knife:**
  - Used to remove cappings from honey comb
  - Some models have heated blades, others use hot water.
- **Capping scratcher:**
  - Used to remove cappings before extracting.
- **Comb section cutter:**
  - Used to cut comb for packaging.



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## Honey Extraction

- **Uncapping tub:**
  - Area where comb is uncapped.
  - Tank collects any honey spilled during uncapping.
- **Extractor:**
  - Machine for removing honey from frames.
  - Uses centrifugal force.
- **Settling tanks:**
  - Tanks used to store honey and allow debris to be removed from honey once extracted.



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## Queen Marking/Clipping Equipment

- **Queen marking cage with sponge plunger:**
  - Cage in which to put the queen for easy marking.
  - Plunger allows you to immobilize queen for marking.
- **Marking paint:**
  - To identify and facilitate finding the queen.
  - Can use small nail head to mark queen.



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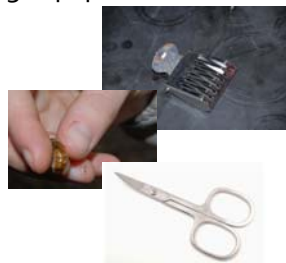
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## Queen Marking/Clipping Equipment

- **Queen capture cage:**
  - Metal or plastic portable cage to hold the queen while you are working frames.
  - Prevents accidental damage to the queen.
- **Scissors**
  - To clip queen wings to prevent her from flying.



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