Oregon Master Beekeeper Program

Beekeeping Resource Manual

Beekeeping Equipment

Session 3

Oregon State Beekeepers Association

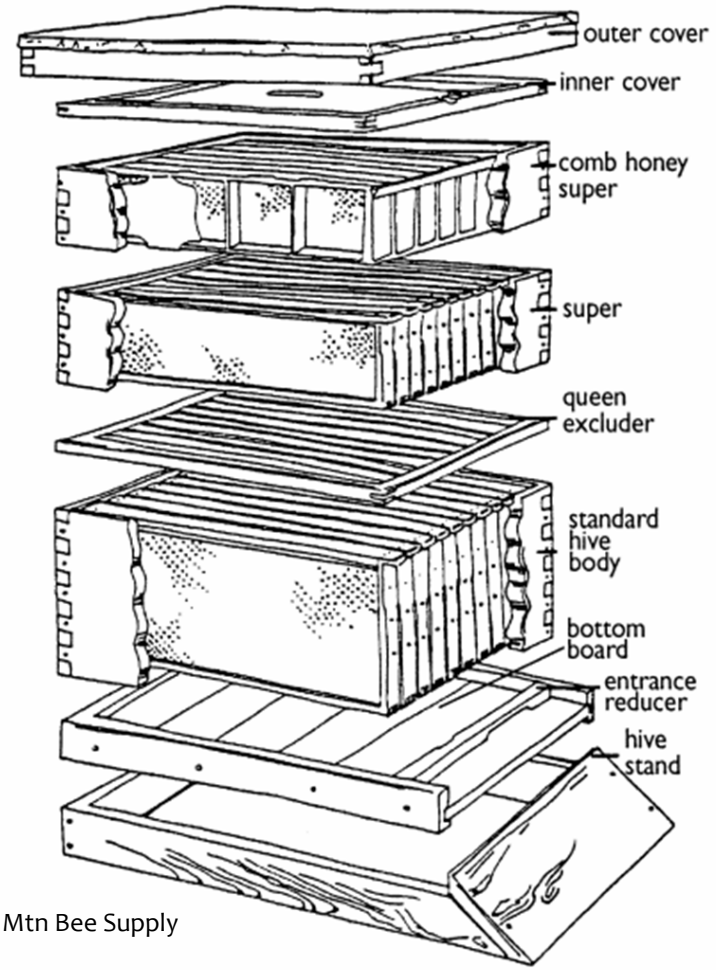
Oregon State University OSU Extension Service

Keys to Starting

- Knowledge of bee biology
- SCIENCE + ART - an artist's touch
- commitment of time and interest
- a bee hive
- personal protective equipment
- bees
- a location for bees - i.e. apiary

Basic Hive Equipment

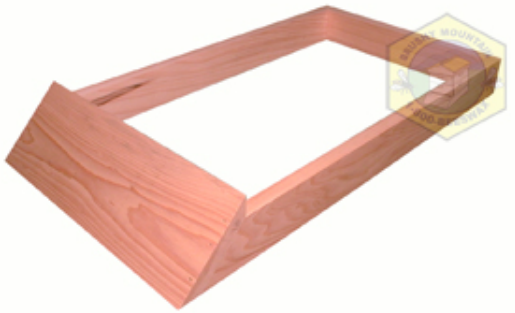
- Hive stand (optional)
- Bottom board
- Hive body (1 or 2)
- Frames (10 per hive body)
- Foundation
- Queen excluder
- Super (2 to 4 per colony)
- Inner cover
- Top cover



Courtesy Brushy Mtn Bee Supply

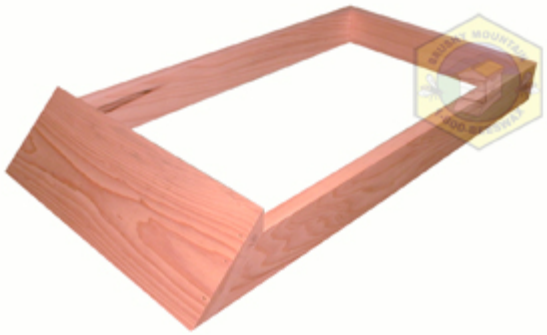
Hive Stand

- Provides stable/elevated base to hive
- Made of wood or other material (cinder blocks)
- Placed below bottom board – elevates hive, reduces pests, creates dead air space
- OPTIONAL (but very useful)



- Commercial - $11.50- $12
- Homemade

Hive stands



Cinder blocks + hive stand

Bottom Board

Wooden bottom board

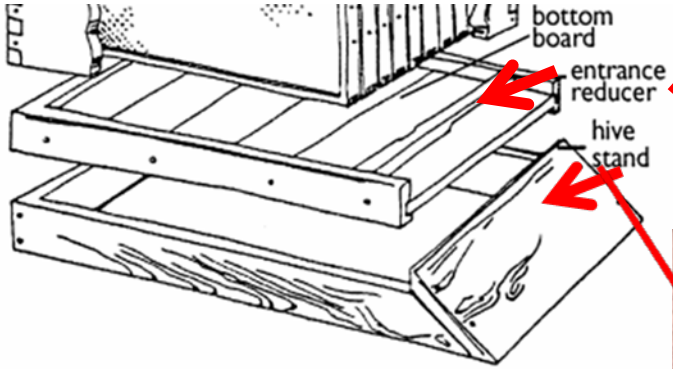
Bee hives on wooden pallets

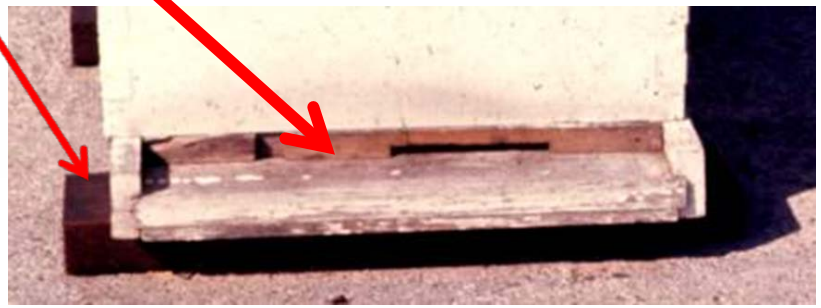
Screen Bottom Board

- Solid bottom replaced by 5 to 8 mesh screen with air space below for passive mite control – here mite counting board partially removed
- Some like to close during winter or for new hive installs

Entrance Reducers

- Considered beneficial to use entrance reducer during winter &/or/ to avoid robbing with small colonies





Brood Chamber Boxes

- Part of the hive for bees - 1 or more hive boxes (bodies) for brood rearing – in winter top box is for winter feed (food chamber).
- Serves as brood rearing home for bees
- Hive body holds 8 or 10 frames
- Usually made of wood but plastic OK

- Cost: $14.75 - $26

Brood Chamber boxes

- Hives have 1, 2 or more boxes for brood
- Boxes may be standard, medium or shallow

Hives commonly may be:
1 standard box w/ ½ depth (western) box
1 standard (in southern areas)
2 or 3 ½ depths (westerns)
other dimensions

10 frame standard w/ frames

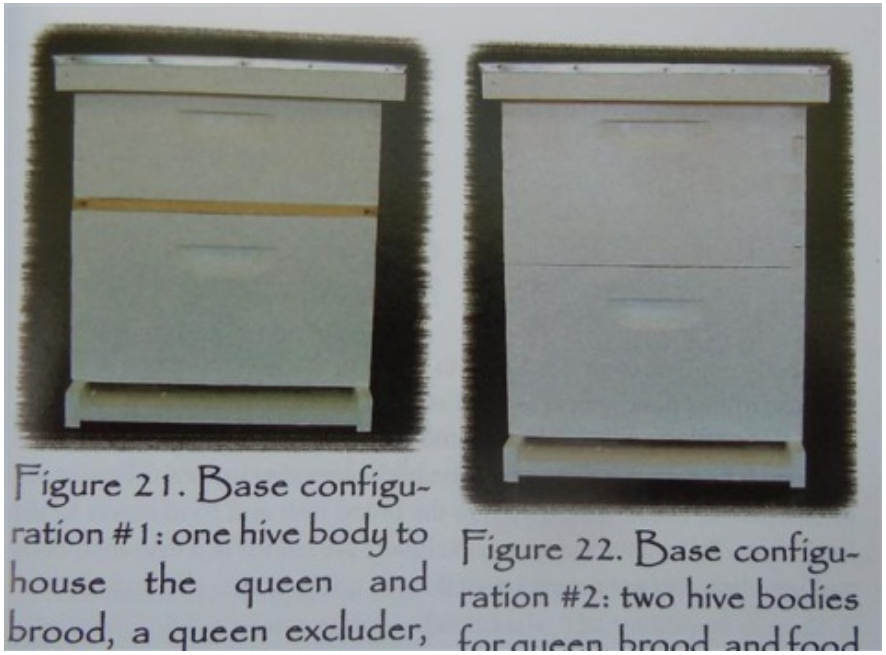
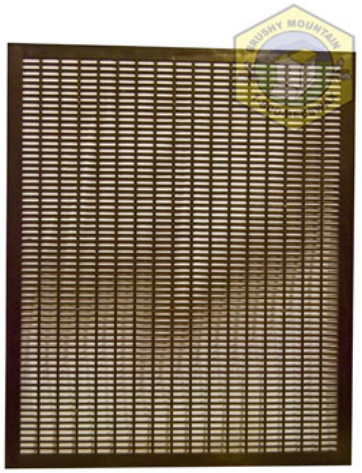


Figure 21. Base configuration #1: one hive body to house the queen and brood, a queen excluder,

Figure 22. Base configuration #2: two hive bodies for queen brood and food

Queen Excluder

- A slotted metal or plastic grid
- Allows worker bees to pass through
- Does not allow queen or drones through
- Prevents queen passing from brood area (below) to supers (above)



- Cost: $3.80- $15.50

Super

- Boxes placed over the brood chamber boxes for honey surplus storage
  - Half depth: 6-5/8 inches deep (western super)
  - Shallow: 5-11/16 inches deep
  - Standard: 9-5/8 inches deep
  - Specialty (section box or cut comb box 4 5/8 in)

Cost: $10.50- $19.50

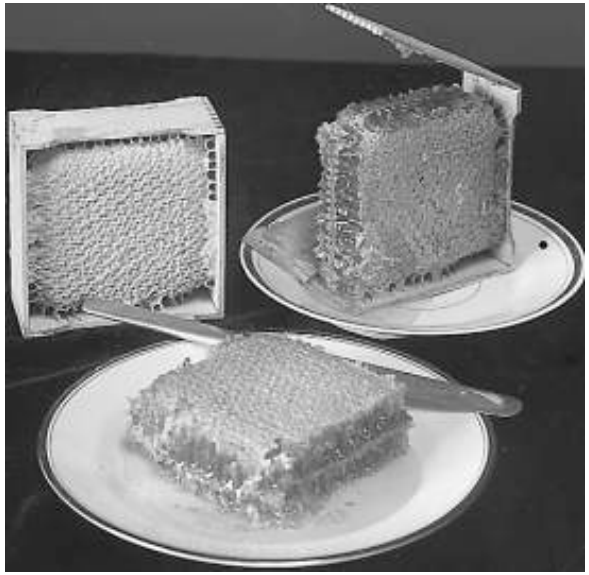
Supers

Decision… You will use different super to produce…

Liquid (extracted) honey

vs.

Honey in comb (section/cut comb)



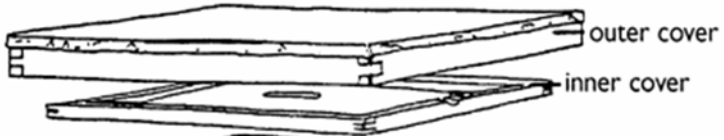
National Honey Board photo

Need supers specific to type of honey

Extracting super sizes…

Inner cover

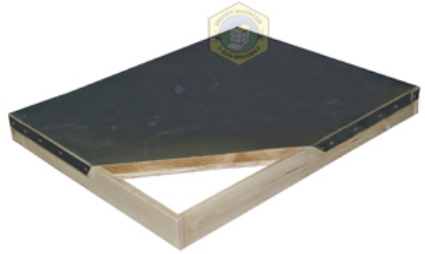
- A cover used under the top cover on a bee hive



- Cost: $9.50 - $12

Top cover

- Outermost cover enclosing a hive
- Telescoping covers close top and 2 inches on all 4 sides. Some peak roofed
- Most have metal covering
- Migratory (CA) cover common



- Cost: $18- $50

Alternative hive covers

- Western or migratory cover – used without inner cover

- Extra piece of wood, tin, plastic for additional hive shelter (shade/winter/ rain protection)

Assembly/preparation major items

- Most economical purchase is k-d (knocked-down) – you assemble equipment
- Alternative - purchase assembled
- You need only hammer (nails supplied) and glue (recommended to nail and glue)
- Major pieces should be painted on outside

Home made

- Bottom board, boxes and inner/outer cover are relatively easy to assemble
- If you have wood-working equipment you can make these major pieces

Can you save money making your own?

Alternatives to Langstroth hive

- 8 frame Langstroth hive (vs. 10 frame)
- Dadant jumbo (11 very deep frames)
- Observation hive (see next)
- Top bar hive
- Warre hive

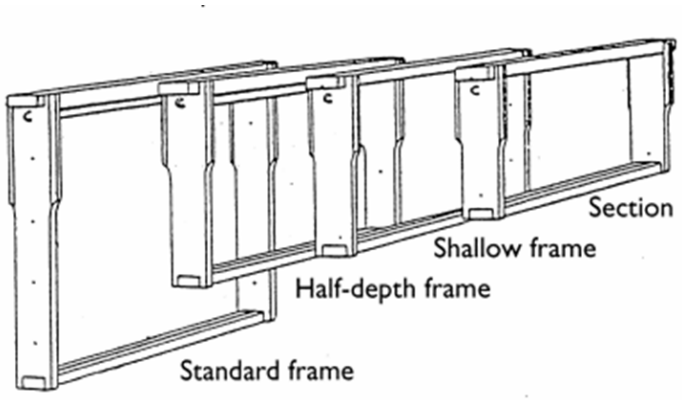
Observation/Observational hive

- Small hives – harder to manage

Ulster Observational Hive

Frames

- Four pieces of wood assembled as a rectangle
- Holds beeswax combs
- Modern Hoffman frames have a thick top bar (w/ wedge) for support and end bars with shoulders to provide bee space between adjacent combs and sides of the hive
- Can be purchased assembled or unassembled, and in bulk – also plastic
- Cost: **$0.95- $2.90 each**



Lowest/highest costs of hive

• Hive stand	• $11.50	• $12
• Bottom board	• $14	• $19
• Hive body	• $14.75	• $26
• 10 frames: $0.95 each	• $9.50	• $29
• Queen excluder	• $3.80	• $15.50
• Super	• $10.50	• $19.50
• Inner cover	• $9.50	• $12
• Top cover	• $18	• $50
• **Total**	• **$91.55**	• **$183**

Disclaimer

- It is not necessary to purchase all of the items included in the previous slide to have a functional hive at the lowest cost.
- A more basic hive can be purchased to include a top, inner cover, hive body, entrance reducer, bottom board, and 10 frames

- Cost: $61.75

Foundation

- Pure beeswax or plastic (with or without thin beeswax coating
- Need appropriate size for frame dimensions & to be securely attached
- Prices and needs vary
  - Standard crimp wired for brood
  - Basic foundation – need horiz wires
  - Foundation for supers for extracting – may or may not be wired
  - Foundation for honey in comb consumption

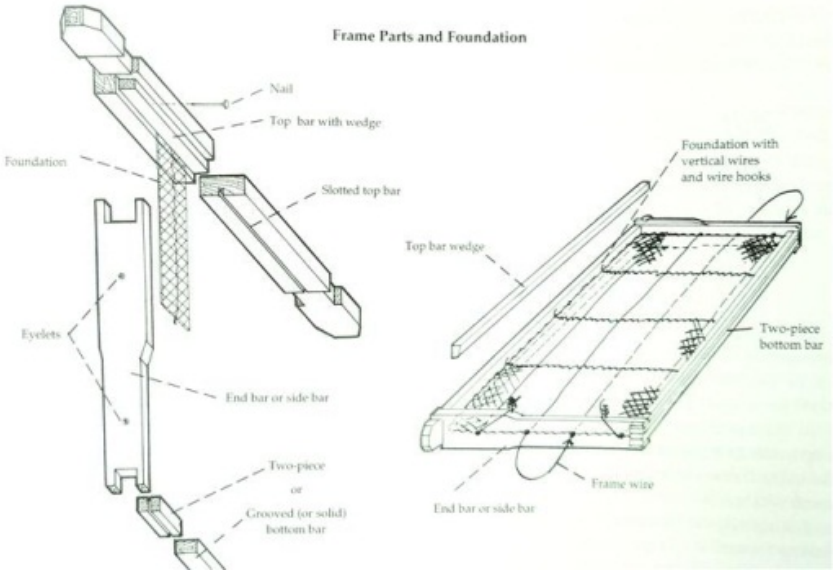
Installing foundation

Figure 36. The hooks from the vertical wires must rest in the top bar groove so that the wedge secures them when it is nailed back in place.

Figure 37. The wedge properly nailed in place, securing the wire hooks

Figure 38. Sink the horizontal wires into the foundation with a spur embedder; if you don't, bees may build the cells in a disorderly fashion along the wire.

Figure 39. The top bar on the left is grooved to accommodate rigid plastic foundation. The top bar on the right is a traditional wedge top bar. You can see how the wedge is only lightly attached, making it easy to remove with a knife (see Fig. 29).



Installing foundation - 2

Bees just beginning to draw foundation – note horizontal wires (added by beekeeper) - foundation lacking vertical wires

Protective Equipment

- Smoker & Hive tool
- Bee veil
- Coveralls
- Gloves
- Other products

Smoker

- Disperses bees from hands
- Causes bees to abandon guarding
- Masks odors like the alarm chemical

Smoker

- Use a fuel that burns slowly, generates smoke, has agreeable odor and is readily available
- Possible fuel sources: rotted wood, pine needles, wood shavings, dry plant material, baling twine, bark, cardboard, burlap
- Alternatives: sugar water, canned smoke

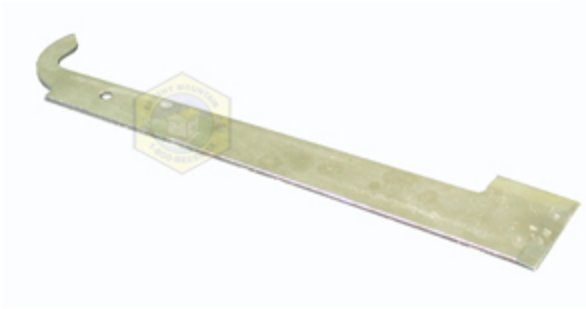
- Cost: $30- $40

Hive Tool [or Frame Lifter]

- Used when examining a hive
- Metal device used to break propolis seals to open hives and pry frames apart
- Hands do not come into contact with bees

- Cost: $6.50- $13

Frame grip



Bee veil

- Pliable wire, nylon, or cloth mesh worn over the face and head to avoid stings
- Black wire mesh allows for ease in seeing bees, but directs bees to face (use light color for Africanized bees)
- Should be bee-tight and designed so bees stay away from the skin

Cost of veil: $15- $30

Cost of helmet: $10- $16

Bee Coveralls

- Specialty coveralls can include a veil and zippers or Velcro that allows easy removal and attachment of the veil
- Cotton or fabric recommended

- Cost: $65-$150 upward

Alternative to coveralls

- ½ jackets
- Wear heavy pants (or two pair) and a windbreaker jacket with long sleeves
- Avoid dark colors, nylon, and rough textures
- Keep pant legs and sleeves bee-tight with elastic, Velcro ties, or tape

Latest in Bee Suits

- It is important to feel comfortable around bees and be able to concentrate on the inspection/ manipulation of the colony

- For different people this may mean different things

Gloves

- Use gloves sparingly
- Plastic, or vinyl close-fitting gloves recommended
- Latex or nitrile

"examination gloves"

- Cost: $<1- $20

Manipulating Cloth

- Placed over the portion of the hive body not being worked on
- Keeps bees quieter while being inspected
- Allows you to withdraw any frame while keeping the other frames covered
- The center can be flipped over to cover the hive completely
- Weighted edges keep the cloth down over hive edge

- Cost: $16

Tool Box and Stool

- Device used to keep tools organized and handy
- Also could be used as a stool to sit on while inspecting the bees

- Cost: $45

Note frame grip & smoker holder

Feeding Bees

Sugar syrup

- To avoid colony starvation (fall, early spring)
- To stimulate colony development (spring)
- To modify foraging population for more pollen collection
- Provide newly hived swarm/package/nuc bees w/ food
- Make queen rearing/requeening easier

Sugar syrup or powdered sugar

- To feed medications

Sugar syrup or protein

- Stimulate drone production/better queen quality

Dry sugar with protein

- To feed supplemental protein to colony

Feeding is never easy

Feeders

- Bees and bee feeders used
- Bees fed sugar syrup, dry sugar candy, powder sugar
- Feeders in common use
  - At entrance (boardman feeder) – not very useful
  - Division board feeder – replaces frame at edge of box
  - At top of colony
    - Top feeder (within empty box or on top of covers (with hole drilled in cover to allow bee access
    - Feeder with removable lid (empty peanut butter jars, coffee cans w/ removable plastic top, cans w/ removable lid
    - Ziploc baggies

Feeding sugar

♦ As sugar syrup

Division Board

boardman

♦ As dry sugar

Feeding honey
Never!

UNLESS you KNOW source & it is needed!

rob extracted supers

'junk' honey in frames

overwinter feed

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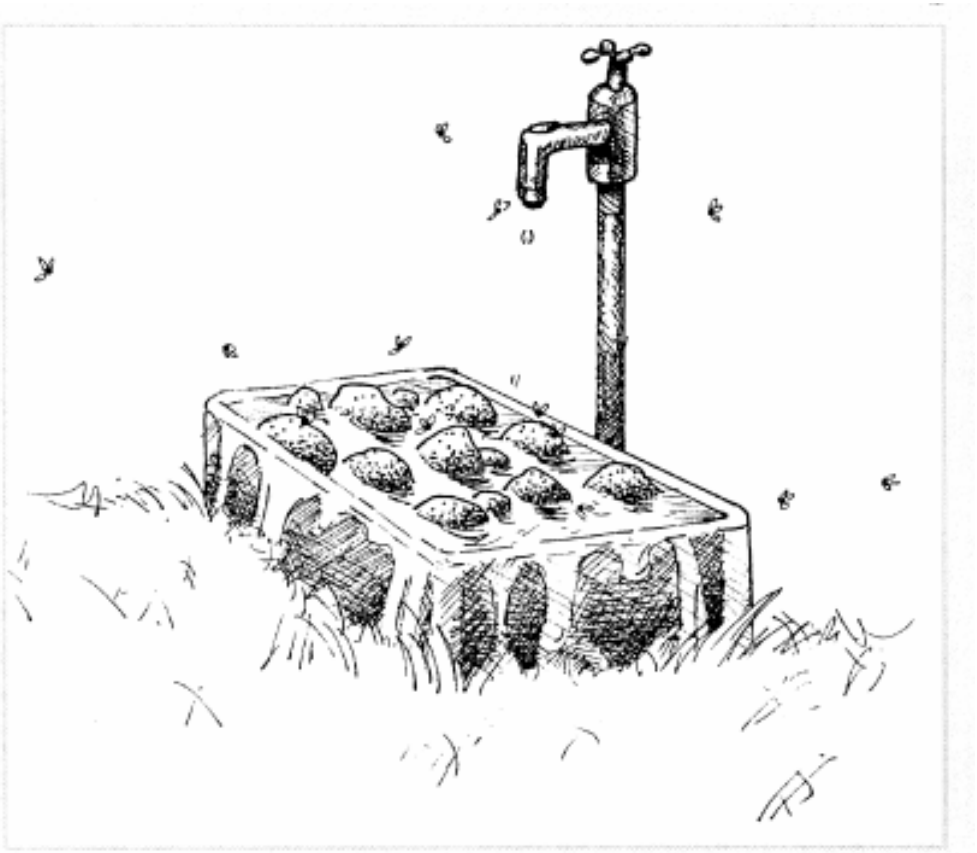
Feeding protein

Supplying water



Beginner's Kit

- Telescoping top
- Inner cover
- 10 frame hive body
- 10 wedge top divided bottom far frames
- Bottom board
- 10 sheets of 8 1/2 Crimp Wire foundation
- 40 supporting pins
- Entrance reducer
- Hatless veil
- Pair of large plastic coated gloves
- Smoker with smoker fuel
- Bee brush
- 10" hive tool,
- Plastic entrance feeder,
- Beginners book
- Beekeeping video
- Cost: $160

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Sources of Bee Equipment

- Several Major manufacturers have FREE catalogue – get one or more to compare
- Local dealers have supplies and useful advice
  - Glory Bee (Eugene)
  - Ruhl (Gladstone) & Portland Bee Center
  - Local sources of boxes/frames
- Advantages/disadvantages of making your own
- Good reasons to NEVER buy bees/used bee equipment

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Discussion Questions

1. What are the most important features of a frame? Why is the top bar thick? What is special about end bars? What is the purpose of the various types of bottom bars? Can the Hoffman self-spacing frame in use today be improved? How?

2. Bee supply catalogues demonstrate many additional pieces of equipment that can be used. Why is it best, other than the expense, to KESS - keep equipment simple, s-----?

3. What is the relationship of foundation to comb? How important are secure and sturdy combs? What problems will appear if comb is not kept confined within the frame?

4. What is the best paint to use for bee hives? Why paint exterior only of hive bodies? How should wooden hive stands/bottom boards be protected?

5. Why do your basic hive boxes come in 3 depths? Can you list advantages and disadvantages of each size (don't forget expense, bee acceptance or bee biology)? What is 8 frame advantage? Why do beekeepers reduce frame number in boxes to 9?

Discussion Questions - 2

6. What is the best size smoker and type of smoker fuel to use? What does smoke have to do with honey bees? What are alternatives to smoke?

7. Beekeepers need to feel comfortable and reasonably protected from stings. What would you consider reasonable for beekeeper protection?

8. What are the relative merits of plastic vs. wood for hive bodies? For frames? Are laminated woods (such as plywood) of use in constructing bee equipment?

9. Why is it so important to have standardized equipment? What are some of the best reasons to use the standard dimensions of the commercial firms selling bee supplies? Can the standard hive dimensions be improved?

10 What facilities are necessary for assembly of equipment? Can you think of gadgets for faster or easier assembly? Can you see areas where gadgets may be of help?

11. What factors need to be considered in buying used bee equipment? Or purchase of non-traditional Langstroth hive like 8 frame equipment, top-bar hives, etc.?

End of Session 3

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OR MB BEEKEEPING

RESOURCE

MANUAL

Dewey M. Caron

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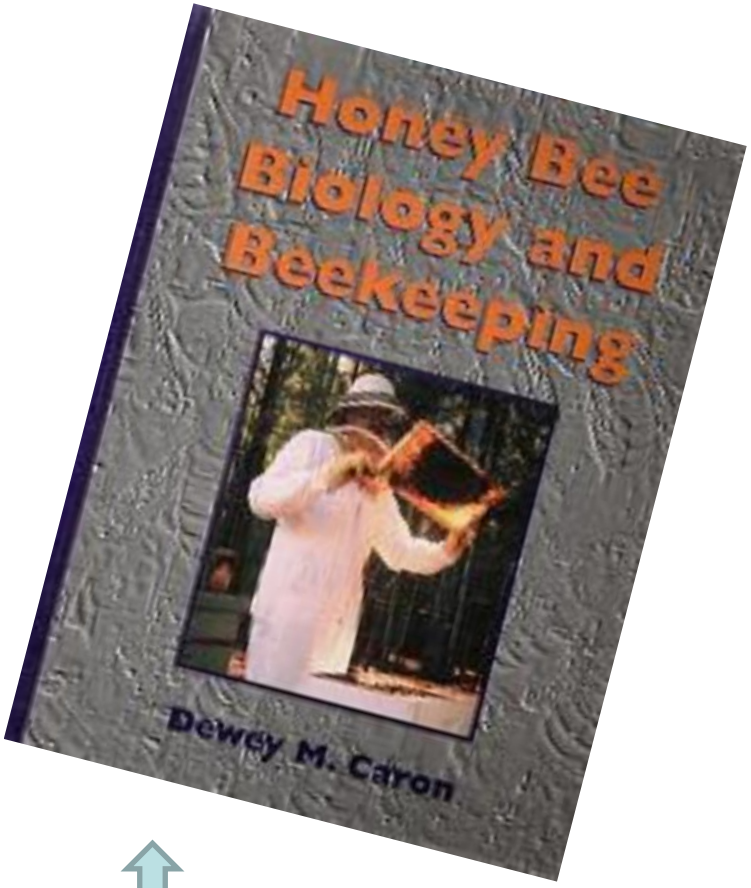

Photos and material courtesy & other sources as identified
Bee equipment from Brushy Mtn & Mann Lake Bee Supply Cos.

Presentation

- Use bee supply catalogues to calculate costs of essentials to start bees
- Assemble complete bee hive as class
- Do project on ways to obtain alternatives and economize on basics and ‘extras’
- Assemble bee equipment as class project – important to assemble frame and foundation & then demonstrate plastic pre-assembled frame
- Visit apiary to see and discuss bee equipment