

MODULE 7: REAR HONEY BEE QUEENS

Module purpose: At the end of this module, the trainee will be able to produce quality queens and populate bee hives for improved productivity.

Approximate training duration of this module: 20 days (4 weeks)

[It is understood that the average training duration is contact time (training under trainer's guidance)]

Practical Exercises:

Graft queens

Rear queens using the cup kit method

Rear queens using locally made queen cells

Practical Exercise 1 : Graft queens

Steps involved

1. Identify a colony with desired traits e.g. productive and strong
2. Prepare the nuclei boxes/breeding boxes
3. Prepare the queen cell holder frames
4. Wear protective gear
5. Light the bee smoker
6. Calm the bees by gently smoking
7. Open the bee hive
8. Identify sealed brood combs and place them in a breeding box
9. Identify pollen combs and honey
10. Place pollen combs and honey in the breeding box
11. Graft the eggs from the desired colony into the queen cells (e.g. those made manually using beeswax)
12. Place the eggs in the cells on the frame in the middle of the queen rearing box
13. Check after 2 days to confirm acceptance of eggs
14. Cage the queen cells after 12 days of grafting
15. Monitor the emergence of queens into cages until the 17th day
16. Collect the emerged queens in their cages and place them in prepared nuclei boxes

Performance standards (observable and measurable criteria):

- Quality queens produced

Related knowledge:

- Explain bee biology, anatomy and physiology
- Explain honey bee behavior
- Describe honey bee castes and their roles
- Describe the techniques of queen rearing
- Explain why breed/rear queens

Required tools, equipment and materials:

Nuclei boxes, grafting tools, protective gear, smoker, smoking materials, fire source, queen cages, hive tools, sugar syrup and feeder boxes, queen cells, queen cell holder frame

Safety concerns:

- Put on protective wear
- Handle queens carefully
- Warn neighbours of the on-going work to minimize bee stings and complaints

Errors (what may result if incorrect decisions are made):

- Failure to raise queens
- Death of many bees
- Abscondment
- Bee stings

Practical Exercise 2: Rear queens using the cup kit method

Steps involved

1. Identify honey bee colony with desired traits e.g. a productive and strong honey bee colony
2. Prepare nuclei boxes
3. Prepare queen cell holder frames
4. Naturalize/make the cup kit acceptable to the bees by placing it in the bee hive for 3 days
5. Wear protective gear
6. Light the bee smoker
7. Calm down the bees by gently smoking
8. Open the identified bee hive
9. Identify and remove an empty comb in the middle
10. Cut the identified comb in the middle and fix the cup kit
11. Place the comb back in the middle of the bee hive
12. Check the cup kit after 36 hours for eggs
13. Remove the cups with eggs and fix in the queen cell holder frames in the nuclei boxes and monitor progress
14. Cage the queen cells after 12 days
15. Monitor and collect emerged queens in their cages and place them in prepared nuclei boxes

Performance standards (observable and measurable criteria):

Quality queens produced

Related knowledge:

- Explain the honey bee biology, anatomy and physiology
- Explain honey bee behavior
- Describe honey bee castes and their roles
- Describe the techniques of queen rearing
- Explain why queens are reared
- Discuss the floral and bee calendar
- Explain the importance of food supply during queen rearing

Required tools, equipment and materials:

Strong honey bee colonies, nuclei boxes, cup kits, protective gear, smoker, smoking materials, fire sources, queen cages, hive tools, sugar syrup, feeder boxes, queen cell holder frames

Safety concerns:

- Put on protective wear
- Inform neighbours to avoid accidents

- Handle the queen with care

Errors (what may result if incorrect decisions are made):

- Failure to raise queens
- Bee stings
- Abscondment
- Death of many bees

Practical Exercise 3: Rear queens using locally made queen cells

Steps involved

1. Identify a honey bee colony with desired traits e.g. a strong colony
2. Naturalize the queen rearing frame (make it acceptable to bees by placing it in the bee hive for about 3 days)
3. Make the queen cells using beeswax and fix on the queen rearing frame
4. Prepare the nuclei boxes
5. Wear protective gear
6. Light the bee smoker
7. Calm down the bees by gently smoking
8. Open the bee hive
9. Identify brood frames and place them in the queen rearing box (about 2 sealed brood combs)
10. Identify pollen and honey combs and fix them in the queen rearing box (place the pollen next to the brood and honey at the end)
11. Place the frame with locally made queen cells in the desired mother colony for the queen to lay eggs
12. Transfer the frame with the eggs (in queen cells made locally) into the queen rearing box (nuc)
13. Monitor acceptance of the eggs and cage accepted cells after 12 days
14. Collect emerged queens in their cages and place them in prepared nuclei boxes

Performance standards (observable and measurable criteria):

- Quality queens produced

Related knowledge:

- Explain honey bee biology, anatomy and physiology
- Explain honey bee behavior
- Describe honey bee castes and their roles
- Describe the techniques of queen rearing
- Explain why queens are reared
- Discuss the floral and bee calendar
- Explain the importance of having abundant food during queen rearing

Required tools, equipment and materials:

Strong honey bee colonies, nuclei boxes, protective gear, smoker, smoking materials, fire source, queen cages, hive tools, sugar syrup, feeds boxes, queen cell holder frame, beeswax, pen/sticks, pan

Safety concerns:

- Put on protective wear
- Inform neighbours to avoid accidents and complaints due to bee stings
- Handle the queens with care

Errors (what may result if incorrect decisions are made):

- Failure to raise queens
- Bee stings
- Abscondment
- Death of many bees

MODULE 8: MAKE FRAME BEE HIVE

Module purpose: At the end of this module, the participants will be able to make frame bee hives. S/he will also be able to prepare and install these bee hives

Approximate training duration of this module: 20 days (4 weeks)

[It is understood that the average training duration is contact time (training under trainer's guidance)]

Practical Exercise 1: Make frame bee hive

Steps involved

1. Prepare materials e.g. acquire seasoned timber
2. Plane timber to uniform thickness of 2cm
3. Measure and cut timber according to dimensions
4. Split the cut timber to the standard dimensions
5. Rivet timber for joining
6. Join pieces of timber to form the brood box
7. Join pieces of timber to form the super box
8. Cut wire mesh and frame with wood to make the queen excluder
9. Assemble top cover
10. Drill entrance holes on the brood box
11. Measure and cut timber for making frames
12. Assemble pieces of timber to make frames
13. Fix wires into frames (see fig 1)
14. Prepare wax foundation sheets
15. Measure and cut out space bars to separate frames
16. Fix space bars on brood and super boxes
17. Measure, cut and join timber pieces following the dimensions to make the base
18. Assemble the bee hive in the following sequence: brood chamber, queen excluder, super chamber and top cover
19. Paint outside the bee hive with light colours
20. Fix/engrave a label

Langstroth bee hive plan:

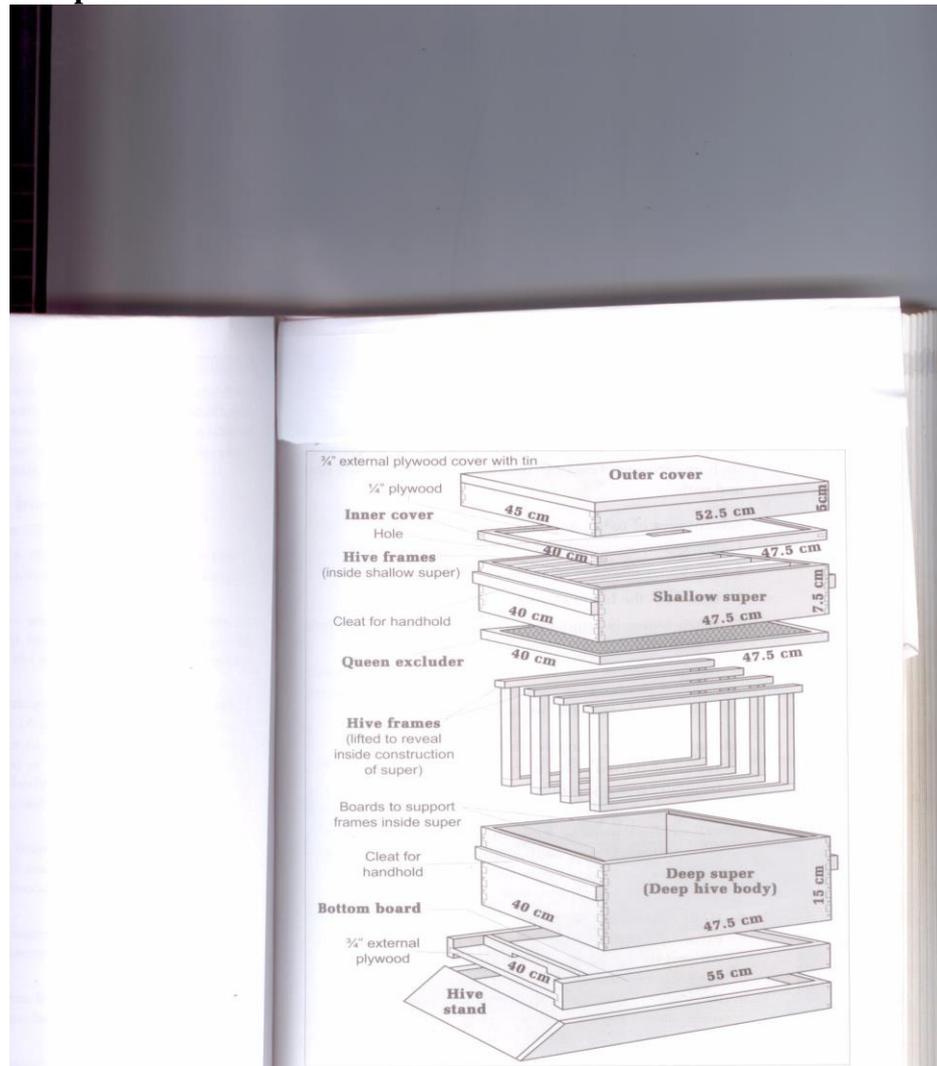


Fig. 1: Langstroth hive dimensions

LANGSTROTHS HIVE

All wood used should be of 2cm thickness.

(1) Cover

- Frame 57cm x 50cm of width 4cm and thickness 2cm
- Fitted with plywood top of size 57x50
- Then covered with plain iron sheet gauge 32.

(2) Inner cover

- Plywood cut to size 48cm x 48.5cm

(3) Supper / Honey box

- Size 42.5cm x 50.5cm and height of 14cm
- It has a top rebate inside on the sides of 42.5cm. The rebate size is 2cm in depth and 1cm in length.
- Fitted with frame spacer to accommodate 11 frames

(4) Queen excluder

- Coffee tray wire cut to size 42cm x 50cm
- Framed with bindings at the edges. The size of the bindings is 2.5cm width and 2mm thickness

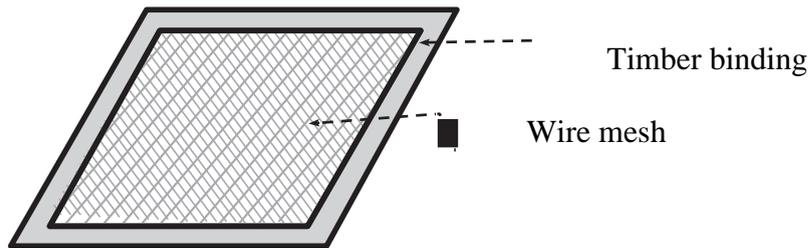


Fig.2: Queen excluder

(5) Brood box (Please check figure 3)

- Size 42.4cm x 50.5 cm x 28cm
- Fitted with bottom board which leave 1cm gap from bottom line
- It has a top rebate inside on the sides of 42.5cm. The rebate size is 2cm in depth and 1cm in length.

(6) Supper frame (Please check figure 3)

(7) Brooder frame(Please check figure 3)

All other dimensions are the same as of supper frame except the sides

- Top pieces are made of sizes 2cm x 2.5 cm
- Side and bottom pieces are made of sizes 1cm x 2.5 cm

(8) Stainless wire

- Super frame is fitted with 2 stainless wires of gauge 0.47mm
- Brooder framer is fitted with 3 stainless wires of gauge 0.47mm

(9) Wax foundation sheet

- Super frame is fitted with comb foundation sheet
- Brood frame is fitted at least ½ of the comb foundation sheet

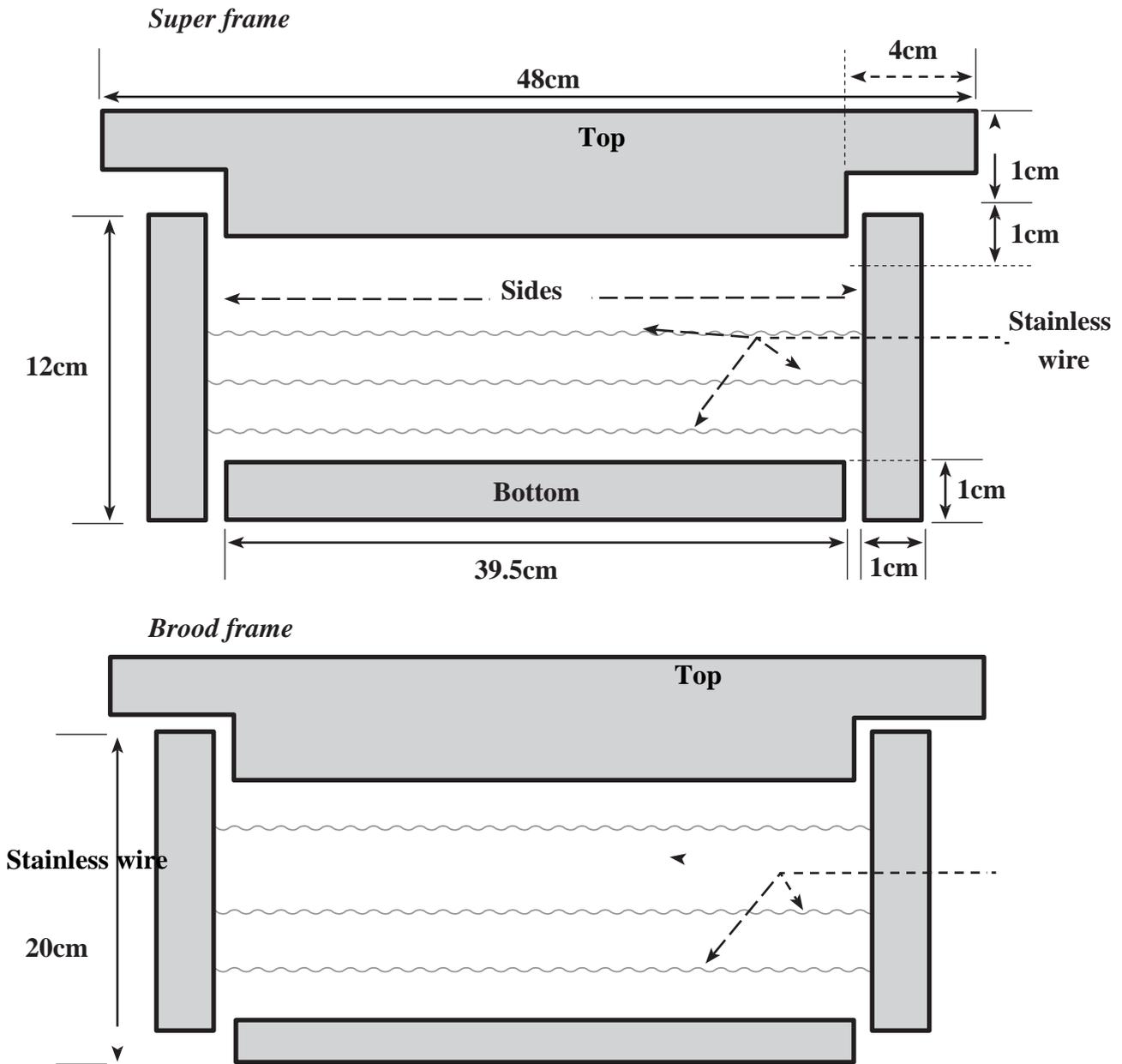


Fig. 3: Dimensions of frame

Performance standards (observable and measurable criteria):

- Seasoned timber
- Accurate measurements
- Fresh foundation sheets used
- Stainless wires gauge 0.48mm

Related knowledge

- Discuss honey bee nesting ecology
- Explain the bee hive types used and advantages for each type
- Discuss the advantages of using frame bee hives
- Discuss the disadvantages of using frame bee hives
- Explain the quality and species of timber for bee hive making
- Explain how bees are managed in frame bee hives
- Discuss how baiting can be done in frame bee hives
- List materials used for bee hive baiting

Required tools, equipment and materials:

Wood/timber, nails, plane metal sheet, wire mesh, tack nails, scissors, drill bits, hammer, hand brace, work bench, tape measure, pencil, planing machine, chisel, circular saw/electric, sand paper, paint, gloves, apron, labels/engraving machine

Safety concerns:

- Wear safety gear
- Clean the site and store the materials properly after bee hive construction to avoid injuries

Errors (what may result if incorrect decisions are made):

- Loss of resources e.g. human resource and materials
- Loss of finances
- Poor quality bee hives that may not be colonized

MODULE 9: PERFORM ADVANCED ENTREPRENEURSHIP TASKS

The above modules must have an Advance Entrepreneurship task to ensure that the participants do everything as a business.

Module purpose: At the end of this module, the trainee will be able to perform advanced salesmanship and customer care tasks as well as marketing of bee hive equipment.

Approximate training duration of this module: 20 days (4 weeks)

[It is understood that the average training duration is contact time (training under trainer's guidance)]

Practical Exercises:

- 1: Perform advanced salesmanship tasks
- .2: Perform marketing tasks
- 3: Provide customer care

Practical Exercise 1: Perform advanced salesmanship tasks

Steps involved

1. Develop a business plan
2. Develop sales proposals
3. Apply communication skills
4. Maintain sales records
5. Update financial records
6. Update administrative records (colony and operational records)
7. Supervise subordinates
8. Prepare work schedules

Performance standards (observable and measurable criteria):

- High sales of bee hive equipment
- Successful beekeeping business

Related knowledge:

- Discuss business laws
- Describe principles of budgeting
- Discuss constituents of financial statements
- Explain key considerations for starting up a beekeeping business
- Discuss challenges in running a beekeeping business
- Explain the purpose of developing a business plan

- List components of a business plan
- Discuss the sources of funding
- List the components of a sales proposal
- Discuss hiring and managing people
- Describe the procedure of updating financial records
- Discuss types and channels of communication
- List the types of financial and administrative records used in beekeeping
- Describe the key components of colony records
- Describe the key components of operational records

Required tools, equipment and materials:

Paper, pens, computer and printer, trained personnel

Safety concerns:

Observe safety and environmental precautions

Errors (what may result if incorrect decisions are made):

- Low sales
- Losses in business
- No or few customers attracted to the business

Practical Exercise 2: Perform marketing tasks

Steps involved

1. Advertise bee products
2. Conduct market research
3. Develop a market proposal

Performance standards (observable and measurable criteria):

Increased sales

Related knowledge:

- Discuss challenges in running a beekeeping business
- Explain the importance of conducting a market plan
- List components of a market plan
- List components of a sales proposal
- Describe the procedure of conducting a market research
- Discuss types and channels of communication

Required tools, equipment and materials:

Paper, pens, telephone, computer and printer, trained personnel

Safety concerns:

Observe safety and environmental precautions

Errors (what may result if incorrect decisions are made):

- Financial losses in business
- Low sales of bee products

Practical Exercise 3: Provide customer care**Steps involved**

1. Advise clients
2. Promote client relations
3. Provide after sales services
4. Conduct service evaluation
5. Exercise information and communication techniques

Performance standards (observable and measurable criteria):

- Satisfied customers
- Growing business

Related knowledge:

- Describe how to retain customers
- Describe how to manage a beekeeping business
- State factors that influence success of a beekeeping business
- Define customer relations
- Explain factors leading to a successful beekeeping enterprise
- Discuss the importance of customer care
- Describe how to measure customer satisfaction
- Discuss how to evaluate a beekeeping business
- List the methods of handling customer complaints

Required tools, equipment and materials:

Paper, pens, computer and printer, telephone, trained personnel

Safety concerns:

Observe safety and environmental precautions

Errors (what may result if incorrect decisions are made):

- Low sales
- Losses in business
- Low customer retention