



**Beekeeping Basics - Certificate II**  
**Participants Learning Guide**

**RTE2157A Open and reassemble a beehive**



**Australian Government**  
**Department of Agriculture,  
Fisheries and Forestry**



**Australian Honey Bee  
Industry Council**

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Judith Nettleingham and Bruce White assert their moral rights to be identified as the authors of this publication.

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## Resources you will need for this unit

For this unit of competency, you should have:

- Participants Learning Guide (this booklet)
- Participants Assessment Worksheets
- Bee Agskills: A Practical Guide to Farm Skills, NSW Department of Primary Industries 2007 available from <http://www.tocal.nsw.edu.au/reader/tocal-publications/bee-agskills>
- a beehive with active bees
- an experienced beekeeper
- tools and equipment:
  - protective clothing
    - bee veil
    - bee-proof overalls and gloves
    - ear protection
    - steel capped boots/shoes/gaiters
    - sunhat
    - unperfumed sunscreen lotion
  - bee smoker, with
    - box for smoker
    - smoker fuel
    - box of matches
  - hive brush
  - hive tool
  - empty bee box and or clean lid
  - bucket of water and soap with towel
  - bee blower and or bee escape boards if removing honey.

- super cracker
- loaders
- queen excluder
- vehicles
- apiary barrow.

**The Participants Learning Guide** is designed to introduce the topics and to provide you with some practical and written activities which will allow you to develop both your knowledge and skills in each area.

**The Participant Assessment Worksheets** include activities that you will be completing as part of your formal assessment for this unit.

Please record as much detail as you can as your responses to these activities will form part of your assessment.

You will need to send the Participants Assessment Worksheets to your assessor. Check with your assessor to find out if they need you to submit this Participants Learning Guide as well.

### **Important safety notes**

If this is the first time you are opening a hive, ask an experienced beekeeper to show you what to do and be on hand to help you in case you get into trouble.

If your work requires the use of load-shifting equipment, you must have the appropriate licensing/training/certification required in your state or territory.

## Introduction

**In this unit, you will learn about:**

- preparing to open a beehive
- opening the beehive
- reassembling the beehive.

**Before you start this training you should be confident about your skills to:**

- work safely around bees comply with OHS requirements, including manual lifting
- follow work instructions and standard operating procedures
- select and use appropriate personal protective equipment and beekeeping tools, including a bee smoker.

**You should know about:**

- bee behaviour, particularly when beehive is disturbed
- components of a beehive.

**Why this task is important**

This is a very exciting time for all beekeepers as every time a hive with a colony of bees is opened you can see the condition of the colony.

Bee hives are opened for many reasons, such as:

- checking the health of the colony – pests and diseases of brood and adult bees
- checking on the queen
- looking to see how much honey is stored
- removing a honey crop
- requeening the colony
- making up a new colony
- culling combs

- adding comb foundation
- deciding if it should be moved to a new site
- just looking at how the colony is progressing.
-

## 1. Prepare to open a bee hive

### When to open the beehive

Its best to open a hive mid-morning on a bright sunny day. This is when the field bees will be away from the hive in the field and so you will have less bees to deal with.

You can now work through the following sections. These will help you practice a standard procedure for opening bee hives to inspect them.

You will also find a useful illustrated explanation of this process in the Bee Agskills book.

The most important parts of a bee hive that you will need to know about are:

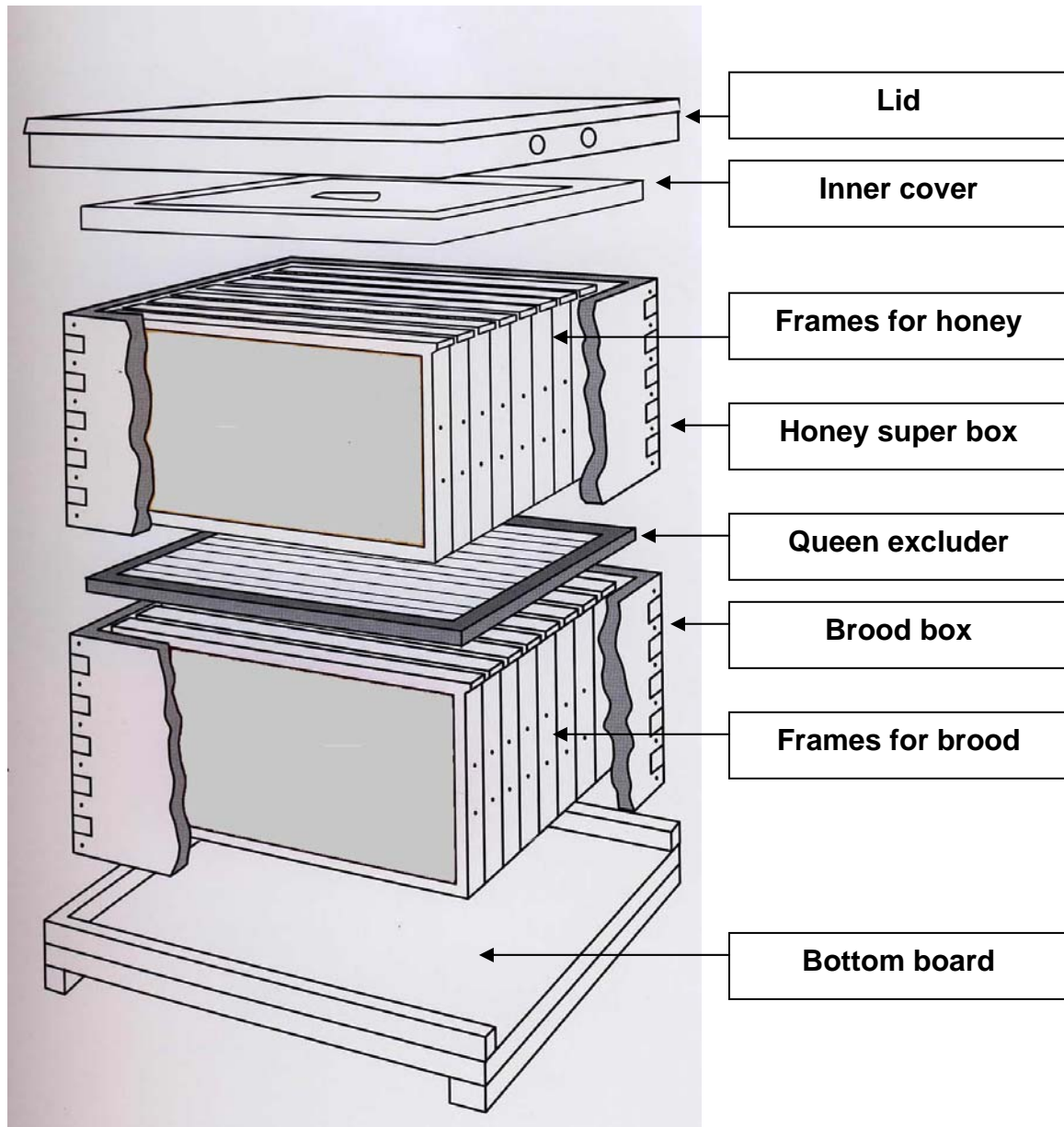
- brood box
- super
- lid
- frames
- queen excluder.



*Beehives are opened for many purposes, such as manipulating brood or inspecting to see if honey is ripe.*

*Source: Bruce White*

## Parts of a bee hive



*(diagram adapted from Bee AgSkills)* N.B. The front cleat on the bottom board should jut out about 30mm to provide a landing for the bees.

## Tools and equipment

### **Activity**

Check with your supervisor or advisor – what special tools and equipment do they use to open a hive for inspection?

List these tools and equipment items here:

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Always check that the tools and equipment you need are available and in good working order. If any items look worn or damaged, or if any are missing, you need to deal with this before going any further.

### **Timing**

Plan to open the hives at the most suitable time.

### **Activity**

Ask your supervisor or advisor when they usually open hives and why. Note what they say in the space below.

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Most beekeepers will prefer to open hives on a warm sunny day when the field bees are active in the field and when nectar and pollen is available to the hive. This reduces the risk of bees from other hives robbing the open hive (robber bees) and is less stressful to the colony.

**Activity**

Ask your supervisor or advisor about any special precautions they would take if they have to open and check hives under conditions that are less than ideal.

Note what they say in the space below.

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**Occupational health and safety**

Check for any occupational health and safety hazards. This needs to become a habit before you start work on any task and while you are doing the task.

The best way to identify common hazards is to observe other people doing the tasks and to ask others, such as fellow workers, your supervisor or advisor. Some workplaces have detailed written OHS policies or checklists that include:

- information about the common OHS risks for each task
- what actions must be taken to reduce or minimise the likelihood of that hazard happening
- how to report any hazards and who you must report to.

If there is a written OHS policy or checklist that covers the task of opening a hive, obtain a copy and, using a highlighter pen, mark the things that you are responsible for.

**Activity**

What do you think are the likely OHS hazards that might occur while you are opening and inspecting a bee hive?

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**Activity**

How did you identify these hazards?

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Common hazards will depend on where you are carrying out the task and may include:

- branches or limbs falling from nearby trees
- snakes near or under the hive box
- bushfire or other weather related hazards.

**Biosecurity**

In some cases, for example where a disease or pest has been discovered, you may not be able to travel to a specific area to open and inspect hives. In other cases, you may be able to open and inspect hives but will need to comply with the site quarantine or biosecurity orders, for example, by decontaminating your clothing, equipment and vehicle before leaving the apiary site to opening another hive.

**Activity**

Is the hive or apiary under any site quarantine or biosecurity orders?

Ask your supervisor or advisor how you would know if there were site quarantine or biosecurity orders in effect. Note what they say in the space below.

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## 2. Open the beehive

**Note:** You will find the photos on pages 30 – 36 of the Bee AgSkills book are very helpful in showing you how to open and reassemble a bee hive.

### Put on protective clothing

- Double check that it is snug with no gaps where bees can crawl in.

### Light the smoker

- Beekeepers smoke bees because the smoke masks the bees' alarm pheromones and this makes the hive easier to work.
- Do this out of the wind, a little distance from the hive, taking care to avoid all fire risks.
- It is very important to make sure the smoker continues to stay alight even after you let it sit for a few minutes.
- Always have fuel and matches handy at all times.
- Just before approaching the hive, give the smoker a few puffs to ensure it produces large volumes of smoke.

### Smoke the bees

- Stand at the side of the hive and aim the smoke at the hive entrance guard bees. It is very important to aim the smoke at the bees.
- You only need to use five or six puffs. Over-smoking or under-smoking can result in the bees being difficult to control.

### Open the hive

- After smoking the entrance, wait 10 to 20 seconds.
- Then carefully push the back of the hive tool under one back corner of the lid, pushing down and lifting the lid upwards with your other hand.
- Once the seal of wax and propolis is broken, with one hand lift the lid, with the other hand, put the hive tool down, pick up the smoker and apply smoke to the bees on the top of the exposed frames.

- Place the removed lid on the ground with the outside surface on the ground. You can place the lid on either side of the hive or at the back.
- Smoke the tops of the exposed frames with two or three gentle puffs to keep the bees under control.

### **What to do if there is more than one box - handling 'supers'**

- Hives can be one or more boxes high.
- In this case, to remove the super boxes above the bottom brood box, push the flat blade of the hive tool between the two boxes similar to the way you removed the lid.
- Smoke between the two boxes. Put the smoker down and with one hand in the hand holes at either end of the super and with knees bent, lift the super and place it on the up-turned lid so it is a neat fit. If there are other supers, they can be placed on top of this up-turned lid.
- Supers can also be placed vertical with one end on the ground to keep the frames clean and place on the lid of another adjoining hive.
- Once the super has been removed, puff smoke onto the top bars of the frames in the hive to control the bees.
- A specially-made super cracker can also be used to remove lids and super or supers. This two-piece metal device is very useful at breaking the wax and propolis (the 'seal') that bees place between lids and supers. It is placed on the lid or super to be removed and one arm pulled.



*A 'super cracker' will help release the super from the brood box where the bees have glued them together.*

*Source: Bruce White*

### **Working with a queen excluder**

- A queen excluder is commonly used on hives between the brood chamber (bottom box) and first super. Avoid damage to the queen excluder when removing the super by pushing down on the hive tool. Never push the hive tool onto the excluder as this will damage the excluder.
- Once the super has been removed, use smoke on the top bars of the frames in the brood chamber. Then remove the queen excluder using your hive tool and hands.
- Check the queen excluder for the presence of the queen. If she is on the queen excluder pick her up by the thorax and place her in the brood box or drop her into the brood chamber or at the hive entrance. Make sure you observe that she is now in the brood box.
- Place the queen excluder on top of the super or lean it against the super.

### **Taking out the frames**

- Place an empty bee box with a bottom or empty super on a lid in a convenient position.
- Kneel beside the hive and gently puff smoke over the frames to control the bees.
- Loosen the second frame from the box wall with the hive tool held in the horizontal position.
- Using the blade end of the hive tool, move the hive tool sideways between the top bars of the frames. This will break any burr comb that is built between frames making them difficult to remove.
- The second frame from the wall is the easiest to remove using this method. It is not likely to have the queen on it so there is less chance of squashing her.

- Gently re-smoke the top bars of the frames and the space made between the frame you are removing.
- Using the hook end of the hive tool under one end of the top bar near the frame end, lift the frame up a couple of centimetres.
- Hold the other end of the frame with your fingers and slowly remove the frame. Avoid any sideways movement so no bees are squashed.
- Always hold the frame vertically with both hands so bees don't fall off.
- Holding the frame at eye level, examine the frame and bees.
- Turn the frame while holding it vertically and examine the other side.
- Once the frame has been examined, it can be placed into the empty super or spare box.
- Other frames can then be removed and examined the same way and placed into the spare box or super or replace into the brood chamber.
- Continue to use smoke to control the bees during the frame manipulation.

#### **What to do if inspecting for brood disease**

- If you are carrying out a disease inspection of the brood, you need to remove all the bees from the frames being inspected.
- To do this, remove the first frame holding it by the lugs at both ends, and with the tips of your fingers, flick the frame upwards so the frame jolts against the palm of your hand and dislodge most of the bees at the hive entrance. You can then examine both sides of the frames for any disease symptoms.
- For other frames in the hive, use the same method as above to shake the bees into the brood box.

#### **Using a bee brush**

- You can also use a bee brush to brush the bees from the frames. For the first frame removed, brush the bees at the hive entrance. For the other frames in the hive, brush the bees back into the brood box.

- You can examine the frames in the super or supers using these methods.
- If you are removing honey from the supers, you can use a bee blower escape board or bee brush. to remove the bees.

### **Bee behaviour**

During the process of opening the hive and removing the frames, you will have many opportunities to observe bee behaviour.

By using the bee smoker correctly, the beekeeper can control bee behaviour, for example:

- when you aim your smoke at the guard bees at the hive entrance, you will observe them going back into the hive and incoming field bees will not land until the smoke clears
- smoke applied under the lid or between supers results in the bees running down between the frames making them less likely to want to sting you.

Once you can see the top bars of the frames, you will observe the 'bee space'. If it is correct, you will see very little burr comb. If incorrect, excessive amounts of burr comb will be built between the combs.

By examining the frame and bees, you may observe bees with pollen on their hind legs, pollen stored in the cells.

Brood at various stages of development indicates the hive has a laying queen.

You may also see bees dancing to indicate to other bees sources of nectar, water, pollen or propolis.

Sealed and unsealed cells of nectar, with new white wax on the tips of open cells of nectar will indicate the bees are on a honey flow.

Observing how much hair is present on the thorax will indicate the various ages of bees - the more hair the younger the worker bees.

If drone brood and adult drones are present it indicates prosperity in the colony.

**Activity**

Working with your supervisor or advisor and using the correct personal protective equipment and the right tools, open a bee hive and take out and examine a number of frames.

### 3. Reassemble the bee hive

- If the bees appear to be becoming aggressive, continually apply light puffs of smoke aimed at the bees.
- Replace the frames in the same position they were in when you opened the hive unless you have some reason to do otherwise e.g. if removing honey or culling combs.
- When you come to put back the last frame, shake or brush the bees off to avoid squashing the bees as only a narrow space is left for this last frame.
- If a queen excluder was on the hive replace it the same way it was when you removed it.
- When putting on the super, be careful not to squash any bees. Smoke the edges of the super and brood box or brush the bees away.
- Slide the lid on so as to not squash the bees. Sliding will push the bees out of the way.
- When moving to the next hive, check the fuel. Remember keep up a good supply of fuel in the smoker so the smoke remain cool.

#### Finishing the job

- Extinguish the smoker correctly and make sure that the fuel is completely put out.
- Clean your hive tool and smoker bellows.
- Wash your gloves with soapy water to remove any wax or honey.
- If inspecting for signs of disease or pests, especially where there are site quarantine or biosecurity orders in place, you may need to decontaminate yourself, your equipment and tools.

#### Activity

Working with your supervisor or advisor and using the correct personal protective equipment and the right tools, reassemble the beehive.

## Some reminders about working safely

- Avoid using hair spray, after shave, perfume or deodorants, especially those that are perfumed. The smell upsets bees and increases the risk of bee stings.
- Make sure there is nothing likely to fall on you if the hives are under or near trees.
- If possible, have someone with you who has opened a hive before.
- Make sure your smoker is producing plenty of smoke before starting and light the smoker in a safe area.
- When putting down the smoker, ensure that it is in a safe area so as to prevent fire the lid of an a joining hive is an ideal spot.
- Ensure your protective clothing is 100% bee proof with no gaps for bees to crawl onto your skin.
- If you feel you are losing control of the hive, increase the smoke onto the bees and yourself, reassemble the hive and walk away.
- It is difficult to open and reassemble a hive without squashing some bees, but with care you can reduce this to a minimum.
- If stung, always scratch the sting out.
- Don't stand at the hive entrance. From time to time give the entrance a puff of smoke.
- If in a backyard situation, consider your neighbours and try and open your hives when the neighbours are not at home. It can take several hours for the hive to settle down after being opened.
- Supers full of honey can weigh up to 30kgs. If you have trouble lifting them, remove some of the frames to make the super lighter.

## Important points to remember!

- Do everything carefully and quickly.
- Don't leave the hive open and exposed for extended periods of time.

- Always aim smoke from the smoker at the bees as the smoke minimises the defensive behaviour of the colony.
- Never stand in front of the hive entrance.
- Always work the hive from the side as the incoming field bees can become aggressive and sting you.

## Final activities and assessment

Now that you have completed all the activities in this Learning Guide, take some time to practice opening and reassembling bee hives under a variety of commonly encountered working conditions.

When you are ready, you can complete the assessment tasks that are listed in the Participants Assessment Workbook for this unit of competency.

## Useful references

*Bee Agskills: A Practical Guide to Farm Skills*, NSW Department of Primary Industries 2007

*The Bee Book: Beekeeping in Australia*, Peter Warhurst and Roger Goebel  
2nd edition Queensland Department of Primary Industries and Fisheries