



Beekeeping Basics - Certificate II
Participants Learning Guide

RTE2305A Use a bee smoker



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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What this learning guide covers

This learning guide will help you meet the requirements of the unit of competency:

- *RTE2305A Use a bee smoker.*

As this is a fundamental skill for all beekeeping work, you will be able to demonstrate your practical skills for this unit at the same time that you are assessed for other units of competency, such as:

- *RTE2157A Open and reassemble a beehive*
- *RTE3155A Manipulate honeybee brood.*

Resources you will need for this unit

For this unit of competency, you should have:

- Participants Learning Guide (this booklet)
- Participants Assessment Worksheets for this unit
- 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 bees
- an experienced beekeeper
- tools and equipment:
 - protective clothing
 - bee-proof overalls
 - socks and gloves
 - steel capped boots/shoes
 - sunhats
 - bee veils
 - sunscreen lotion
 - bee smoker (lid, barrel, bellows and a heat guard)

- smoker fuel (such as pine needles, clean Hessian bag or sack)
- newspaper (to start the smoker)
- box of matches or cigarette lighter
- hive brush
- hive tool to open and close the smoker lid
- empty bee box and or clean lid
- bucket of water and soap with towel
- fire proof box for smoker
- bee blower and or bee escape boards if removing honey
- super cracker
- loaders
- queen excluder
- vehicles
- wheelbarrow
- minimum of one knapsack spray pump with tank:
 - capacity of not less than nine litres
 - fully charged with water
 - complies with Australian Standard 1687–1991
- one rake hoe or similar implement capable of removing grass, shrubs, vegetation and other flammable material from fire area.
- soapy water to clean the smoker bellows and hive tool after use.

Note: you may need other tools and equipment depending on the other bee husbandry tasks you are going to be doing.

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 note

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

Introduction to this unit

In this unit, you will learn about:

- using a bee smoker to manage bees.

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

- interpret the impact of weather, nectar flow and strain of bee on defensive behaviour of colony
- 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.

You should know about:

- effects of smoke on bees and hive products
- legislation and regulations relating to use of bee smokers, especially in relation to fire protection and bushfires
- suitable fuel for bee smokers
- when and why to use a bee smoker.

Why this task is important

The bee smoker is used to control the bees. The smoke from the smoker minimises the defensive behaviour of the colony allowing you to control the bees with the minimum risk of being stung. It is a very important safety piece of equipment when you work the bees.

A bee smoker can be dangerous you can burn yourself or start a fire.

It is very important to light the smoker correctly and extinguish it safely after use.

A note on buying a bee smoker

Bee smokers vary in size and shape. Some are made by local manufacturers and others are imported.

The barrel is usually made of stainless steel for holding the smouldering fuel. Choose the largest barrel you can afford as it will stay alight longer. Pick the bellows shape that suits you. It is worth while testing a number of smokers to find the one with the most powerful bellows.

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.
- Avoid using hair spray, after shave, perfume or deodorant s, especially those that are perfumed as the smell upset bees and increase the risk of bee stings.

You can now work through the following sections. These will help you practice a standard procedure for using a bee smoker.

1. Why do beekeepers use smoke?

Bees communicate in two main ways - by scent or smell (also called pheromones) and by movement (for example, the waggle dance to show the location of a food source in relation to the hive and the sun).

Smoke puffed onto a colony of bees will hide other smells, such as the alarm pheromone emitted by guard bees at the hive entrance. The other bees are confused by the smoke and some bee researchers suggest that the 'chain of command' in the colony breaks down. With the right amount of smoke, bees just do not know what to do for a short time, and this gives the beekeeper an opportunity to carry out their work without too much difficulty or risk of being stung.

Different types of bees in the colony may react in different ways to smoke:

- Guard bees at the hive entrance emit an alarm pheromone (but this is masked by the smoke)
- Young bees that are too young to fly will move to the part of the hive that is furthest from the smoke
- Other bees head for the honey and begin to eat as much as they can. Scientists suggest this is because they are preparing to abandon the hive in the event of a fire.

2. Preparing the smoker for use

Note: You will find the photos on pages 26 – 28 of the Bee AgSkills book very useful.

Weather conditions

The first step is to confirm the climatic conditions. You should check the weather details and any warning or fire bans on the radio, web or contact the weather bureau or fire service in your state.

The bee smoker should not be used in strong windy conditions as a stray spark could start a serious fire.

Beware of fire regulations in your state. Some states permit the use of bee hive smokers in times of total fire ban when the registered beekeeper has a written permit.

Total fire bans

The Bureau of Meteorology doesn't have the power to declare a Total Fire Ban. This responsibility resides with designated fire agencies in each State and Territory.

However in South Australia, the Northern Territory and Victoria the Bureau does issue fire ban advices to assist in publicising them. They also include the existence of fire bans, when they are current, in our weather forecasts and warnings.

Bureau of Meteorology: Sample Fire Ban Advice

AUSTRALIAN GOVERNMENT - BUREAU OF METEOROLOGY SOUTH
AUSTRALIA REGIONAL OFFICE

FIRE BAN ADVICE FOR SOUTH AUSTRALIA

Issued at 6:30 am on Friday, 26 November 2004

Friday, 26 November 2004 is forecast to be a day of extreme fire danger and the Country Fire Service has imposed Total Fire Bans in the following districts:

West Coast

Eastern Eyre Peninsula

Yorke Peninsula

Kangaroo Island

Murraylands

You are reminded that fire restrictions apply throughout the fire season. For information on these restrictions, phone the CFS Hotline on 1300 362 361 or go to <http://www.cfs.org.au>

For more information about total fire bans and warnings, see the references section of this learning guide.



Activity

What are the regulations covering using bee smokers in your state or territory AND in any state and territory in which you might be working bees? Appendix 2 has some extracts from current (as at 1 December 2007) regulations. List the main points here:

Check that the smoker is in good working order

Activity

Using the following checklist, check that you are ready to use your bee smoker. Ask your supervisor or advisor about the purpose of each step in the checklist and make a short note of what they say:

	Check....	Why?	Your initials
1	Bellows produce plenty of air when puffed		
2	Smoker lid must fit correctly		
3	Inside of the smoker is clean. If not, clean with hive tool		
4	Heat guard on the smoker is fitting correctly		
5	Identify any health and safety hazards and take appropriate action		
6	Vegetation likely to catch fire near the hive is cleared for a distance of 1.5 metres around the apiary. The area could be mowed before placing the bees on the site.		
7	Rake or hoe is close to where you are working .		
8	Personal protective clothing and equipment is in good condition and fits correctly		
9	All faults or problems are corrected before using the smoker		

Fuel for the bee smoker

Many different fuels are used by beekeepers:

- dried pine needles are very popular, easy to get, produce a cool smoke and are easy to put out.
- clean Hessian (not from bags which have contained chemicals) is very popular with large commercial beekeepers as it stays alight for a long period of time. It is difficult to put out.



Hessian and twine are useful fuels.

Source: Bruce White

- other fuels used include flaky bark from Angophoras, Stringy bark, Tea tree bark, Cypress pine, wood shavings and dry lawn clippings.

Fuels that upset bees include rags anything containing oils or chemicals, hair, paper and feathers.

Any fuels used must be free from chemicals. Always collect fuel when it is available.

Activity

What fuel does your supervisor or advisor recommend and why?

Light the smoker



A safe area for lighting and extinguishing smokers is essential.

Source: Judith Nettleingham

1. Select a safe area to light the smoker so as not to set fire to the surroundings. Of course, not all areas will be as convenient as the one on the photo above!

2. Open the lid of the smoker with your hive tool



Starting to light the smoker

Source: NSW DPI

3. Tear up a sheet of newspaper into shreds and make a loose ball.

4. Light the newspaper

5. Drop the burning paper into the bottom of the smoker barrel.

6. Gently puff the smoker using enough pressure on the bellows to maintain a flame



Adding fuel to the smoker

Source: NSW DPI

7. Then add your smoker fuel in small quantities to the top of the burning paper while gently puffing the smoker bellows.



Adding more fuel while puffing the bellows

Source: NSW DPI

8. When the smoker fuel begins to burn add more fuel.

9. Continue the process until the smoker barrel is half full of fuel.

10. Close the lid of the smoker.



Close the lid of the smoker

Source: NSW DPI

11. If it remains alight without puffing the bellows, fill the smoker with loose fuel.

12. When the smoker is warm, add more fuel while puffing the bellows. Fill the barrel full of fuel, packing it down with the hive tool.

From time to time, you will need to add fuel. If the smoker gets low on fuel, flames can occur. This is dangerous to the bees and could start a fire.

If the smoker keeps going out when not in use, the fuel maybe damp, poor quality, didn't light is correctly or there is not enough air from the bellows to keep it alight, or the nozzle is blocked.

3. Use the smoker to manage bees

- Blow smoke into the entrance of the hive. Allow 10 to 20 seconds for the smoke to calm the bees before opening the hive. Always aim the smoke at the bees.
- After opening the hive apply additional smoke by puffing it under the lid, between the supers and over the frames. Be careful not to 'over smoke'; if you over smoke, the bees will run to excess.



Keeping bees under control while inspecting hives.

Source: NSW DPI

- Ensure your bee smoker is within easy reach when working hives. Many beekeepers hold the smoker with the bellows held between their legs so it is always within easy reach.



Source: Judith Nettleingham

- Regularly check the fuel supply - keep the smoker full of fuel to ensure a cool smoke supply
- Always keep the lighted smoker standing upright.



Source: Judith Nettleingham

Activity

Try it out yourself. Select a number of different possible fuels and apply the following tests to each one. Make a short note about each fuel in answer to the questions in the table below.

Decide which fuel(s) you prefer.

When you can, collect a large bagful of your preferred smoker fuel and store it in a dry place for future use.

	Fuel 1	Fuel 2	Fuel 3	Fuel 4	Fuel 5	Fuel 6

How easy was it to light the smoker with this fuel?						
Did the smoker stay alight?						
Did it produce dense clouds of thin smoke?						
Were there spurts of flame coming out of the nozzle?						
Was the smoke cool when blown onto the palm of your hand?						
Did it burn away quickly or did it last a reasonable time?						
Was the aroma of the smoke acceptable and pleasant?						
Did the smoke upset the bees?						

(Activity adapted from NSW TAFE learners guide 0624A)

4. Cleaning up

Extinguishing the smoker

Depending on the weather conditions, you can:

- Dig a small hole with your hive tool and then empty the smoker fuel into the hole then fill the hole with water and fill with soil.

Or

- Fill the smoker with water.

Or

- Empty the smoker into a an airtight fire proof box with water in it.

Or

- Block the nozzle and then put the smoker into an airtight fire proof box.

If in doubt, put the smoker into an airtight fire proof box, such



The photo above shows smoker boxes designed to hold one smoker. This is useful for extinguishing your smoker.

Source: Bruce White



The photo above shows a larger box which can hold four smokers and hive tools when they are not in use.

Source: Bruce White

Clean the hive tool and smoker

- Before putting the smoker out, place the hive tool in the barrel and puff the smoker to heat up and clean the hive tool.
- Scrape the hive tool clean in the soil.
- Wash the hive tool in soapy water.
- Wash the smoker bellows in soapy water.
- After the smoker has been put out, clean the inside with a screw driver or hive tool to remove any tar build up from the smoker fuel
- When not in use, store your smoker in an airtight fire proof box.

5. Working safely

- Light the smoker in a safe area
- If flames spurt from the nozzle on the lid, the smoker is burning too hot. Add more fuel.
- Ensure you have water or a knapsack full of water with you at all times.
- Don't work in windy conditions
- Clean inflammable vegetation where you are using your smoker
- Don't apply smoke directly to an open cell that contains nectar as sometimes the nectar will pick up the odour of the smoke and contaminate the extracted honey.

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, 2007, NSW Department of Primary Industries

The Bee Book: Beekeeping in Australia, 2nd edition, 2005, Peter Warhurst and Roger Goebel, Queensland Department of Primary Industries and Fisheries available from <https://www.publications.qld.gov.au/>, or phone 1800 801 123.

Fire bans and warnings

Bureau of Meteorology

Information about fire weather warnings

http://www.bom.gov.au/catalogue/warnings/WarningsInformation_FW.shtml

List of current warnings (all weather events, including fire)

<http://www.bom.gov.au/weather/warnings.shtml>

ACT Fire Brigade

http://www.esa.act.gov.au/ESAWebsite/content_actfb/actfb_home_page/fire_brigade_home_page.html

New South Wales Rural Fire Service

<http://www.rfs.nsw.gov.au/>

Bushfires NT

<http://www.nt.gov.au/nreta/natres/bushfires/index.html>

Rural Fire Service Queensland

<http://www.ruralfire.qld.gov.au/>

South Australian Country Fire Service

<http://www.cfs.org.au/default.asp>

Tasmania Fire Service

<http://www.fire.tas.gov.au/mysite/Show?pageId=colFireRestriction>

Country Fire Authority - Victoria

<http://www.cfa.vic.gov.au/>

Fire & Emergency Services Authority of Western Australia

<http://www.fesa.wa.gov.au/>

Appendix - Legislation and regulations covering the use of a bee smoker (as at 1 December 2007)

Note: You must check that you know the most recent regulations that apply in the state and/or territory in which you are working. Where legislation and regulations mention beekeeping activities, this information has been included below. Where there is no specific mention of beekeeping activities, just the name of the legislation is provided.

Australian Capital Territory

Emergencies Act 2004

New South Wales

Schedule 10 Total Fire Ban Exemptions for Government Gazette, 01/06/2006

This allows apiarists to produce smoke for use in connection with the management of bees and beehives provided that:

- the canister is a commercially available beehive smoker designed to prevent the escape of sparks or incandescent or burning material
- the fuel for the canister is lit inside a building or vehicle by a responsible adult person and the canister is sealed prior to leaving the building or vehicle and being taken to the hives
- fire, sparks or incandescent or building material is not permitted to escape from the canister in open air
- the canister is not left unattended while it is alight
- the fuel is totally extinguished inside a building or vehicle by the responsible adult person at the completion of use.
- store your smoker in a fire proof air tight box when not in use.

Northern Territory

Bushfires Act 2004

Queensland

Fire and Rescue Service Act 1990

South Australia

Fire and Emergency Services Act 2005

Fire and Emergency Services Regulations 2005

Section 42—Bees

(1) Pursuant to section 89 of the Act, an appliance used to generate smoke for the

manipulation of bees is prescribed.

(2) A person must not, during the fire danger season, use an appliance referred to in

subregulation (1) unless a portable water spray in good working order is at hand.

Tasmania

Fire Service Act 1979

Victoria

Country Fire Authority Act 1958

38A. Fires for certain purposes to be lawful

- (c) for the purpose of extracting honey, heating bitumen, welding, gas-cutting, soldering, grinding or charring if-
 - (i) a shield or guard of fire resistant material is placed or erected in such a way as to prevent the emission of sparks, hot metal or slag from the fire;
 - (ii) the area for a radius of at least 1×5 metres from the operation is clear of all flammable material or wetted down sufficiently to prevent the spread of fire;
 - (iii) there is available for immediate use in the event of the fire a reticulated water supply or an effective water spray pump of the knapsack pattern with a tank capacity of not less than nine litres and fully charged with water; and
 - (iv) cut-offs and electrode stubs from the operation are placed directly in a fire proof receptacle.....

Western Australia

BUSH FIRES REGULATIONS 1954 - REG 39CA

Operation of bee smoker devices

39CA . Operation of bee smoker devices

(1) In this regulation —

“bee smoker device” means a device used to generate smoke for the purposes of beekeeping;

“prescribed period ” means —

(a) the prohibited burning times;

(b) the restricted burning times; or

(c) a day or any period of a day for which the fire danger forecast issued by the Bureau of Meteorology in Perth in respect of the locality where it is proposed to operate the bee smoker device is “extreme” or “very high”.

(2) For the purposes of section 27A(1)(a)(ii) of the Act, the operation of a bee smoker device in the open air is an operation likely to create a bush fire danger.

(3) A person shall not operate a bee smoker device in the open air during a prescribed period unless —

(a) at least one fire extinguisher is provided at the place where the device is operated; and

(b) the ground within a distance of 3 metres from the place referred to in paragraph (a) has been —

(i) sufficiently cleared of inflammable material; or

(ii) sufficiently damped down with water,

to prevent the escape of fire.

(4) A person who operates a bee smoker device in the open air during a prescribed period shall —

(a) ensure that neither the lighting nor the operation of the device results in the ignition of inflammable material outside the device;

(b) place the device in a fire resistant container when it is alight but not being

held by the person; and

(c) extinguish the fire in the device on completion of its operation.

(5) A bush fire control officer may, subject to the directions, if any, of the local government by which the officer was appointed, issue —

(a) to a person operating a bee smoker device during a prescribed period; or

(b) to the owner or occupier of the land on which that operation is carried out,

such directions as the officer considers necessary for the prevention of fire on that land and the person, owner or occupier, as the case may be shall comply with those directions.