

Pot Up Plants



Learning Guide

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Student name:.....

Student number:.....

INTRODUCTION

Welcome to *Pot Up Plants*. You may need to pot up plants in wholesale or retail nursery work or when doing revegetation or landscaping work. This could be when you are working for your council, doing ranger work or when managing your own country. Training should be completed on the job in a plant nursery over an extended period of time.



EQUIPMENT REQUIRED

To complete this training you will need the following:

1. Appropriate Personal Protective Equipment (PPE).
2. Safety gear including first aid kit and water.
3. Hand tools such as spades, trowels and watering cans.
4. A range of pots and potting mixes.
5. Seedlings or plants to pot up.

It is recommended you do Undertake Propagation Activities before doing Pot Up Plants. You could then do Tend Nursery Plants when you have finished Pot Up Plants.

ASSIGNMENTS

There are three assignments you will need to complete.

Some of these assignments may go towards your final assessment.

Section	Assignment	Competent (C) Not yet competent (NYC)	Date Achieved
Getting Prepared	Assignment 1. Project Risk Assessment		
Potting Mixes	Assignment 2. Plants Ready to Pot Up		
Potting Up			
Finishing Up	Assignment 3. Pot Up Plants		

1A. COLLECTING INFORMATION

Information about potting up plants can be obtained from many sources. There are a few excellent books available that will help you should you require more detailed information. The learning guide for *Undertake Propagation Activities* has a good reference list.

There is also information available online.

1. The Nursery and Garden Industry Association has lots of resources including useful publications and a link to the Nursery and Garden Industry Northern Territory.



www.ngia.com.au

2. Information specific to horticulture in the NT can be found at the Northern Territory Horticultural Association.



www.ntha.com.au

3. For Australia wide information and resources on propagating native plants try the Greening Australia web site.



www.greeningaustralia.org.au

1B. POTTING UP PLANTS SAFELY

There are some dangers associated with potting up plants. It is important that you be aware of some of the potential dangers so you can avoid getting injured or sick.

Some of the things you can do to keep yourself safe include:

1. Wear thick gardening or rubber gloves at all times.
2. Wear appropriate clothes for outdoors (long trousers, boots etc.).
3. Wear protective footwear at all times, in some situations you may need rubber boots.
4. In wet weather always use waterproof clothing.
5. Keep safe distances away from other workers around hand tools.
6. Learn how to maintain and use hand tools correctly to avoid injury.
7. Always lift heavy objects correctly to avoid injuring your back (see Resource 1 for correct lifting procedures).
8. Know where your first aid kit is stored first aid kit and make sure someone has a first aid certificate.



RISKS WHEN HANDLING POTTING MIXES

The handling of potting mixes requires special care to protect yourself from getting sick.

Some potting mixes contain a harmful bacteria called Legionella. The bacteria can cause Legionellosis, a type of pneumonia (this is not Legionnaires disease which is caused by a different Legionella bacteria found in air conditioner cooling towers).

To reduce the risk of infection when handling potting mixes follow these recommendations:

1. Handle all mixes with care to avoid breathing in dust.
2. Moisten the mix to avoid creating dust.
3. Wear suitable PPE to avoid contact with skin and eyes – gloves, dust mask, protective eyewear.
4. Avoid transferring the potting mix from hand to mouth – wash your hands before smoking, eating or drinking, even if you wore gloves.
5. Wash work clothes regularly.
6. Clean work area by wet-sweeping or vacuuming.
7. Seal any opened bags or containers after use and store in a cool location.

Before you begin, use this checklist to confirm you have followed good safety procedures and have all the right resources.

SAFETY CHECKLIST ACTIVITY



Long trousers, shirt and boots		
Hat and gloves		
Sunscreen, insect repellent and sunglasses		
Dust mask		
Additional PPE as needed		
Water		
First aid kit		



Legionella bacteria infects the lungs when breathed in. Symptoms of Legionella infection include: fever, dry cough, breathlessness and chest pain. Other things in the potting mix can also cause lung irritation, asthma, hay fever, inflamed nose and throat – even more reason to be careful.



1 – GETTING PREPARED

1C. WHAT IS POTTING UP?

Propagating plants involves sowing seeds and fruits, making cuttings and other methods to make new plants.

Once plants are established in their pot or tube, with developed root systems, they need to be transplanted into larger pots or containers. Sometimes this can happen more than once if quite a large plant is needed, or if plants need to be kept for long periods. This process is called potting up.

Potting up to the right size container will ensure that plants are healthy and strong.



1D. TOOLS AND SUPPLIES

Using the correct tools will make potting up easier and will help to keep you free from injury.

Tick off the items you think you will need for your potting up activity.

ACTIVITY



Buckets			Trowel		
Bleach			Watering can		
Broom			Hoses		
Pots and other containers			Fertiliser		
Potting mix			Plant labels		
Wheelbarrow			Pencils		
Shovel			Rubbish bins		

1E. HYGIENE

Losing seedlings to disease can be very disappointing, especially as it takes a lot of time and energy to grow good plants. Nursery diseases, such as fungus, viruses and bacteria can spread quickly through a nursery killing plants.

Maintaining good hygiene standards will help stop the spread of disease or weeds. Diseases are spread on any surface, via wind, in water, in potting mixes, on plant material or on boots and clothing of workers or visitors.

KEEP YOURSELF CLEAN

- Keep your boots and clothes clean when working in a nursery.
- Wash your hands regularly with an antiseptic soap.

POTS AND EQUIPMENT

Pots, trays, labels and equipment such as trowels, dibble sticks, wheelbarrows and spades can introduce disease problems if they are re-used without thoroughly cleaning to sterilise them first.

- Scrub off any soil first.
- Soak pots and trays in a bleach solution (10 ml bleach per litre of water) for 20 minutes.
- Make sure you rinse thoroughly with clean water to remove all the bleach.
- Equipment should be washed in the bleach solution and then rinsed.
- All bench surfaces will need to be wiped with the bleach solution before you start work.

PATHS AND FLOORS

- Paths and floors should be kept clean and free from algae to reduce disease and stop people slipping over.
- Scrub all pathways with bleach and a stiff broom.



With your trainer walk around your nursery area and identify any areas of bad hygiene. At each site make some recommendations on how hygiene could be improved.






ACTIVITY

Area of poor hygiene	Improvements recommended
e.g water pooling on pathways	

PROJECT RISK ASSESSMENT



- Stop and think before starting work.
- What needs to be done so you can work safely?
- Complete the **What to do about it?** column – we have written one thing in each box – try and think of some others.
- Fill in all of the last row by adding a new hazard.

HAZARD and what can happen = the risk	What to do about it?
<p>SUN EXPOSURE </p> <p>Risk of: Heat exhaustion, dehydration and sunburn</p>	<ul style="list-style-type: none"> • Wear a hat • • •
<p>TRIP HAZARDS </p> <p>Risk of: Injury from falling over</p>	<ul style="list-style-type: none"> • Don't run – walk carefully • • •
<p>WORKING WITH SOIL </p> <p>Risk of: Soil borne diseases</p>	<ul style="list-style-type: none"> • Wear dust mask • • •
<p>LIFTING THINGS </p> <p>Risk of: Injured back</p>	<ul style="list-style-type: none"> • Use a trolley to move things • • •
<p>BITING INSECTS </p> <p>Risk of: Bites and stings</p>	<ul style="list-style-type: none"> • Wear protective clothing • • •
	<ul style="list-style-type: none"> • • • •

2

POTTING MIXES



A good potting mix should be able to hold moisture for plants to grow but should not be too wet or soggy (or the seedlings will rot). If you pick up a handful of mix and squeeze it and water oozes out then it is too wet.

Other things to remember are:

- Potting mixes should be sterile, free from weeds and soil diseases. Some nurseries have facilities to sterilise their mixes (using steam or chemicals), sand can be sterilised in an oven or microwave, otherwise purchase sterile ingredients.
- Never reuse old mixes or used garden soil. The use of new materials will reduce the chances of disease attacking seedlings.
- Always wash all containers, tools and benches with diluted bleach and water (10 ml bleach per litre of water).

Commercial potting mixes and seed raising mixes from garden centres can also be used instead of mixing up your own.

2A. INGREDIENTS

PEAT



The peat holds moisture so the mix will not be too dry. It also helps hold nutrients. The mix must not have any large peat clumps as this may cause seeds to rot, it should be well sieved or broken up finely before using. Some peat needs to soak in a bucket of water before using.

Many people prefer to use coco peat instead of the more traditional peat moss (peat moss is the decomposed remains of vegetation from a bog or swamp). Coco peat is the coarse fiber from the outer shell of a coconut. It is considered more environmentally sustainable and supports regional industry development in Asia and the Pacific. Coco peat is also known as coir fibre. You should buy good quality coco peat, if it is not already washed, you should wash it before use to remove salts (spread out and 3 hours under a sprinkler).

You may be able to use compost instead if you have no access to peat.

SAND



Sand increases pot weight which helps prevent plants blowing over in the wind. The sand also improves drainage so the mix will not be too wet. It is best to use coarse washed river sand. The sand should be thoroughly washed to remove fine soil particles.

PINE BARK



Pine bark provides good drainage, increases air in the mix and adds organic matter. 3-6mm composted pine bark is a good size for the pine bark chips. Additional nitrogen may be needed as the bark can take nutrients out of the soil as it decomposes.

2B. RECIPES

There are lots of different recipes, talk to your trainer about:

- What is best for your plants.
- What materials you can get locally and can afford.
- What type of environment the potted plants are going to be growing in (sun, wind etc).
- What your watering system is.

Make sure you mix the ingredients up thoroughly using a shovel or a cement mixer.

Basic Mix A provides an option if you live in a remote area, it is based on materials you may be able to find locally. You can use local river sand, and compost instead of peat if needed.



Basic Mix A

Peat (1)



Sand (1)



ACTIVITY

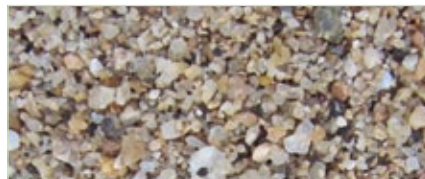
With your team practice making up potting mix.

Basic Mix B

Peat (3)



Sand (1)



Pine Bark (6)



Basic Mix C

Peat (3)



Sand (1)



Pine Bark (1)



3

POTTING UP

3A. WHEN TO POT UP

Plants can develop rapidly in the early stages so keep a constant watch on them. It is necessary to pot up when the plant is ready to outgrow its container. Things to watch for are:

- Healthy leaf growth and roots beginning to appear at the base of the container.
- A healthy white fluffy rootball when you gently pull the plant out of the container.
- Roots spiralling around the bottom of the container.
- Competition causing seedlings to become leggy.
- The potting mix has problems.

For plants grown from seed, new small seedlings are pricked from their trays out into pots or tubes as part of the propagation process – when these small pricked out seedlings are established they can be potted up.

A plant that is very root bound should not be potted up – throw it out.

Plants which have been re-potted at the right time and fed and watered well will grow into strong, healthy trees.

3B. HOW TO POT UP

To pot up follow these instructions:

- Wash any recycled pots or plant bags in a sterile solution of bleach and water to kill bacteria and fungi (10 ml bleach per litre of water).
- Half fill the pot with moist potting mix.
- Place hand over the top of the seedling tube and turn it upside down.
- Tap the base of the tube, squeeze the sides slightly and ease it away leaving roots intact.
- Place the plant in the new pot keeping the same soil level as in the tube, be careful not to bury the stem or it will rot and die.
- Fertilise with one heaped teaspoon of low release fertiliser, making sure not to place it too close to the plant's stem.
- Water the plant thoroughly as soon as possible and place in a shady position initially, gradually moving on to full sun.

Make sure you always handle plants very carefully when potting up. If you are potting lots of plants make sure the soil level is the same in each pot.



healthy root



root bound



3 – POTTING UP



3C. WATERING AND FERTILISING

WATERING

Determine a watering regime that is suited to the plant and growing medium, for example hardy plants in a mix that retains its moisture well will not require as much water. Do not over water, if there is water running out of the bottom of the pot then that is more than ample.

FERTILISING

You can apply a slow release fertiliser regularly to the plants in their pots (or add the slow release fertiliser to the potting mix). Alternatively fertilise weekly with liquid seaweed based fertiliser.



slow release native fertiliser



PLANTS READY TO POT UP

Look at a range of container plants in the nursery. Pick out some and look for signs that they need potting up.

Plant Name	Container Type	List the signs showing it needs potting up

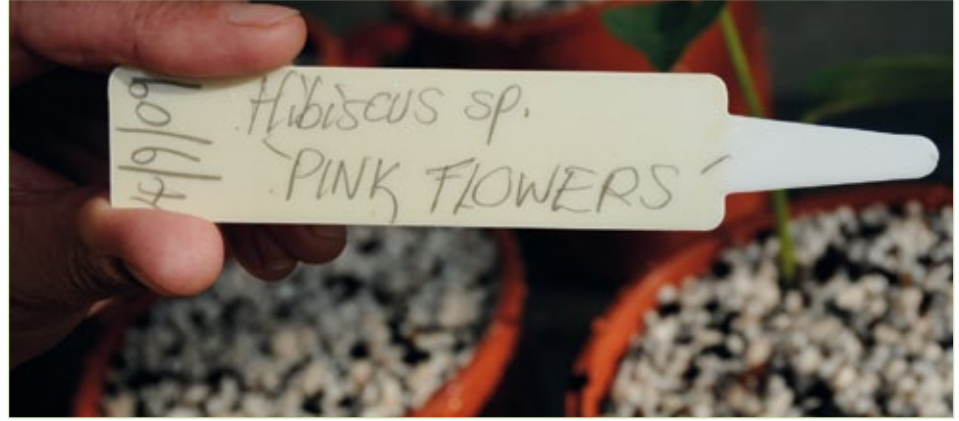
4

FINISHING UP

4A. RECORD KEEPING AND LABELLING

Most nurseries will have records about propagation that need to be filled in. These may be in a book kept in the potting area. Make sure you fill in any records as soon as you have finished potting up.

Make sure the label stays with the plant in its new pot.



ACTIVITY

Practice writing up the records of potting up in your nursery.



4B. CLEANING UP

It is also important for many reasons that all working areas are kept clean and tidy. Messy and dirty work areas are not only a safety hazard they can also help spread plant diseases.

Clean and store away all tools used. All benches should be cleared and wiped down with a disinfectant such as diluted bleach. All floors should be swept to remove all plant material and left over potting mix as these can also be a safety hazard. Wash or hose off the floors. All pathways need to be kept clear.

In any nursery situation it will be very important to keep cross contamination of plant material to a minimum (we don't want to mix diseased soil or plant material with fresh mixes).

4C. DISPOSAL OF WASTE MATERIAL

After potting on plants or propagating plants there is often a range of unwanted waste material left behind that needs to be dealt with. Things such as pots/tubes, unused root bound plants, soil, fertiliser, milk cartons/bags, plastic wrapping, old plant labels, tags, mulch, and plant debris. It is best practice when finished to leave a completely clean site free of rubbish.

Methods of waste disposal could include:

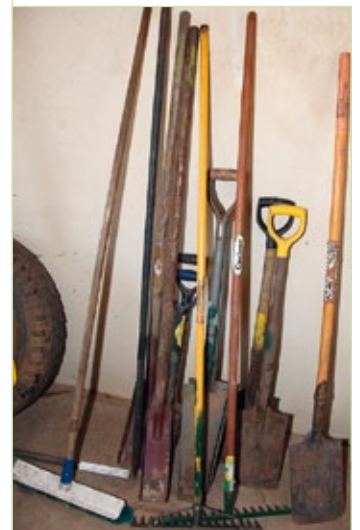
- **Organic waste:** Mulch and composting is suitable for plant debris. For cardboard and paper recycle.
- **Inorganic waste:** Plastic/metal/paper based materials maybe recycled, reused or returned to manufacturer. For inorganic material that cannot be recycled it is best to take to an authorised landfill. Do not burn old containers as the gases given off are toxic.



4D. TOOL MAINTENANCE

To make the next job easy and to prevent personal injury it is very important to keep tools in good condition. Follow the steps below:

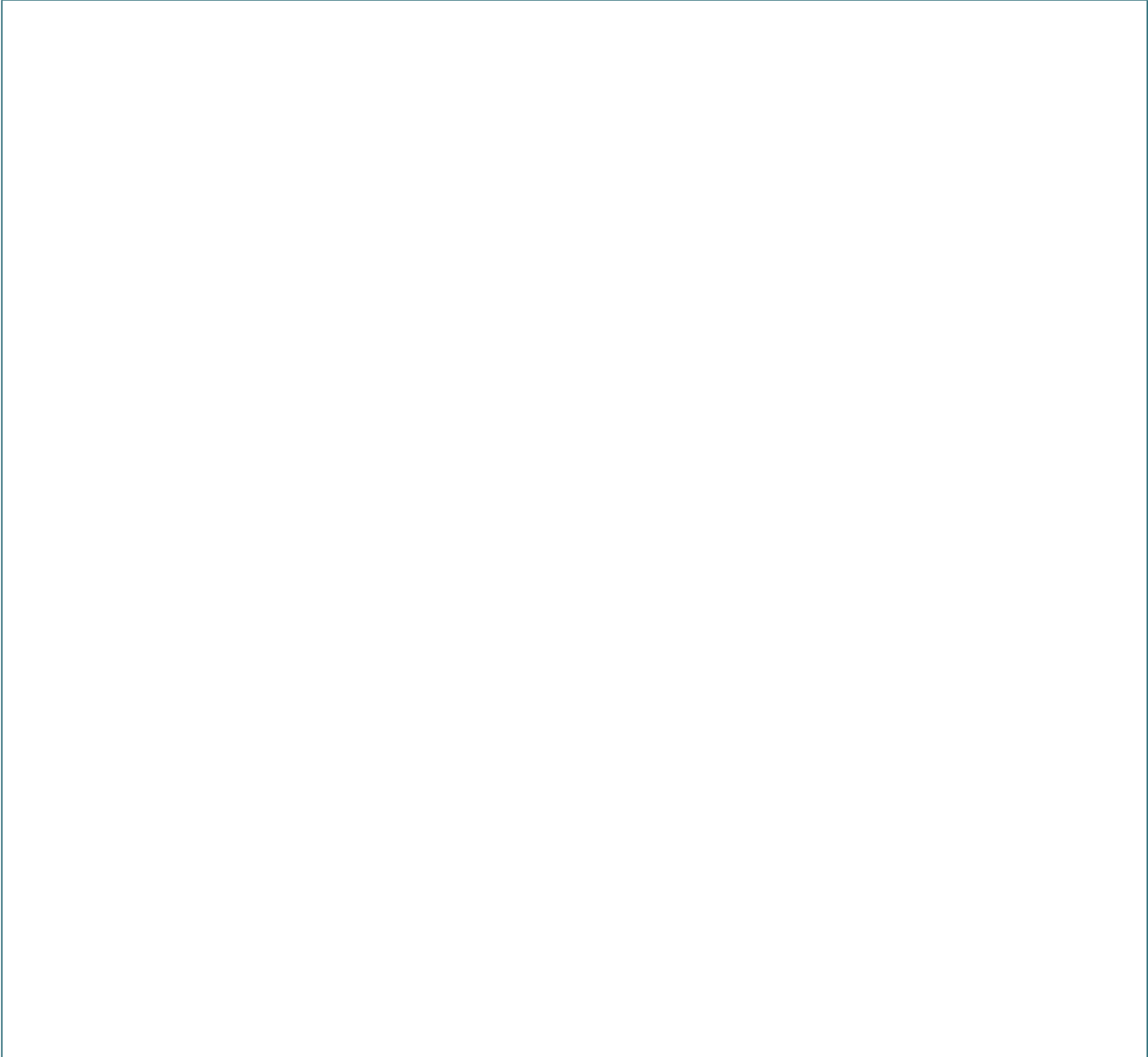
- Wash all tools of mud and dirt and oil any metal parts to prevent rusting. Steel wool and a light oil will remove any surface rust.
- Keep tools sharp and in good working order. Bevel the back edge of a spade off with a bench grinder or a coarse sharpening stone.
- Replace any broken handles. Never use bush sticks as handles as they often break causing injury.
- Sand and oil all wooden handles to avoid getting nasty splinters. Use 50% mineral turpentine and 50% raw linseed oil on wood.
- Store all tools away in the appropriate places.



POT UP PLANTS

Pot up some plants as instructed by your trainer. Then complete this page.

Draw pictures showing the steps of potting up a plant.



List any tools and materials you have used.

.....
.....

List any clean up activities you carried out

.....
.....

BASICS OF GOOD LIFTING

Correct handling of materials is important to ensure a safe working environment. Improper lifting techniques can lead to back pain and learning the right way to lift will help you avoid this.



1. Plan ahead

- Size up the object and test to see if it is possible to lift by yourself
- Clear a path and make sure there are no obstacles in your way
- Practice the lifting motion before you lift the object

2. Lifting the object

- Place your feet shoulder width apart with your feet close to the object
- Keep the object close to your body
- Bend your knees and tighten your stomach muscles
- Get a firm hold on the object and stand up slowly keeping your back straight
- Let your legs do the lifting work
- Take short steps and do not twist

3. Putting the object down

- Keep the object close to your body
- Bend your knees and keep your back straight
- Let your legs do the work
- Wait until it is firmly in place before letting go



ALEP

Aboriginal Landcare Education Program

ALEP Learning Guides. These full colour, step-by-step guides provide practical, easy to follow instructions. Based in the Top End of the Northern Territory, they can also be adapted to other regions.



GETTING READY

1. ALEP Learning Guides – Trainer's Guide
2. Carry Out Natural Area Restoration Works

RECOGNISING PLANTS

3. Recognise Plants
4. Collect, Prepare and Preserve Plant Specimens

GROWING PLANTS

5. Collect, Treat and Store Seed
6. Maintain Properties and Structures
7. Install Micro-irrigation Systems
8. Undertake Propagation Activities

9. Pot Up Plants

10. Tend Nursery Plants

MANAGING COUNTRY

11. Treat Weeds
12. Install, Maintain and Repair Fencing
13. Plant Trees and Shrubs
14. Perform Basic Water Quality Tests

In this learning guide, *Pot Up Plants* you will learn how to:

- PREPARE TO POT UP
- POT UP PLANTS
- CLEAN UP AND MAINTAIN TOOLS

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