ALEP

Aboriginal Landcare Education Program

13

Plant Trees and Shrubs

Learning Guide

Greening Australia

CONTENTS

Student name:.....

Student number:.....

INTRODUCTION

Welcome to *Plant Trees and Shrubs*. This learning guide covers planting trees and shrubs in both land management and horticultural situations. You might need to be able to plant trees and shrubs working for councils, carrying out bush regeneration work, ranger work or when managing your own country. Training for this unit should be completed on the job or out in the field over an extended period of time.

ALEP
Aboriginal Landcare Education Program

EQUIPMENT REQUIRED

To complete this training you will need the following:

1. Appropriate Personal Protective Equipment (PPE).
2. Safety gear for field work including first aid kit and water.
2. Access to a range of hand tools such as shovels, mattocks and wheelbarrows.
3. Trees and shrubs to plant.

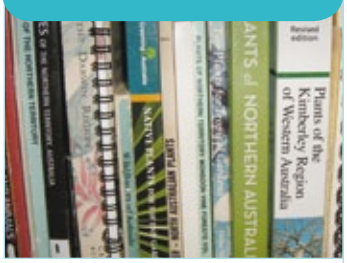
ASSIGNMENTS

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		
Digging Holes	Assignment 2. Planting Plan		
Inspect and Prepare the Plants	Assignment 3. Carry Out Planting		
Planting and Finishing Up			

1 GETTING PREPARED



1A. COLLECTING INFORMATION

Information about planting trees and shrubs can be obtained from many sources. There are excellent books available should you require more detailed information. Here are three useful books available from Greening Australia in the Northern Territory.

- *Native Plants for Top End Gardens*
- *Native Plants for Central Australian Gardens*
- *The Bush Book*

There is also a wealth of information available online.

1. For information on Northern Territory plants, go to the Northern Territory Department of Natural Resources, Environment, the Arts and Sports. They are responsible for managing the flora in the Northern Territory.

   www.nretas.nt.gov.au/plants-and-animals

2. For information on local native plants, planting trees and protecting native vegetation contact Greening Australia. Greening Australia also has nurseries where you can buy local native plants.

   www.greeningaustralia.org.au

1B. PLANTING SAFELY

There are some dangers associated with planting trees and shrubs. 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 gloves at all times.
2. Wear appropriate clothes for outdoors (long trousers, hat, sunscreen boots etc.).

3. Watch out for snakes, spiders, wasps etc. and rusty iron or broken glass in amongst grass.
4. Keep a safe distance between workers using hand tools.
5. Learn how to maintain and use hand tools correctly to avoid injury.
6. Always lift heavy objects correctly to avoid injuring your back (see the Resource at the end of this guide).

7. Extreme caution should be taken when using chemicals for weed control and other purposes and extra PPE should be worn. Only properly trained people should use chemicals, you may want to undertake *Treat Weeds* if you have a weed problem.
8. Motorised machinery such as mowers, augers and slashers should also be used with extreme care. Only properly trained people should use motorised machinery.

9. Always carry a first aid kit and make sure someone has a first aid certificate.

Before you begin, use this checklist to confirm you have followed good safety procedures.

SAFETY CHECKLIST ACTIVITY		✓
Long trousers, shirt and boots		
Hat (hard hat if necessary) and gloves		
Sunscreen, insect repellant and sunglasses		
Water		
First aid kit		
Notified others and have phone/ 2 way radio		
Checked weather, road and fire reports		
Notebook		
Permits (if required) and maps		
Additional PPE as needed		

1C. WHY PLANT TREES AND SHRUBS?

Planting trees and shrubs is important for many reasons including:

- To provide habitat for wildlife
- To provide shade
- To provide wind breaks
- To provide dust suppression
- To improve air quality
- To prevent soil erosion
- To beautify areas
- To provide food
- To screen areas
- To protect buildings from storm damage

1D. WHEN TO PLANT?

The best time to plant is during the first rains in the storm time or "build up" just before the wet season proper or as early in the wet season as possible. These early rains soften the dry hard ground, make digging holes easier and will give the young trees the moisture required to establish themselves.

If there are periods with no rain then young plants will need to be watered until more rains come and the proper wet season starts.

Try not to plant at the end of the wet season as when the dry season comes trees will still be too small to survive without water. Planting during the dry season will mean you will have to water every week until the next rains come.

Whenever possible it is best to plant trees and shrubs when the sun is not too hot. Sometimes plants can suffer transplant shock through disturbance to their roots when planting. The best time of day is early morning or late afternoon. The worst time to plant is in the middle of the day when the sun is at its hottest. Also try to avoid planting in really windy conditions as the wind can dry out the soil very quickly.

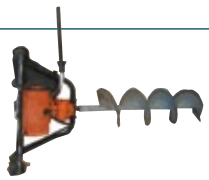
ACTIVITY

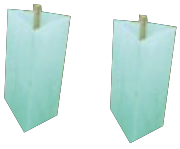
Think about what a plant needs to grow – in your group draw a picture of a plant showing its main parts and list what it needs to grow well.

1E. TOOLS AND SUPPLIES NEEDED

Using the correct tools will not only make the job of planting trees easy but will also help to keep you free from injury.

The following basic tools and supplies will help you plant and keep your trees and shrubs healthy. Tick off the items you think you will need for your particular planting activity.

ACTIVITY		✓
Paper and pens for plan		
Marking paint and flagging tape		
Spray pack, herbicides and extra PPE needed		
Crowbar		
Auger and extra PPE if motorised		
Mattock		
Shovel and spade		
Trowel		

Rakes		
Wheelbarrow		
Tube planter		
Watering can		
Buckets		
Hoses and fittings		
Fertiliser and mulch		
Stakes and tree guards		

1F. MAKING A PLAN

NOTE

Before you start make sure you have the permission of whoever who owns the land. For some projects you will need written permission and/or permits.

Planting trees and shrubs requires more than just digging holes and placing the plants in them. You should walk around the area you are going to plant. Take into consideration:

- the aim of the planting (wind break, shade, dust reduction etc.)
- the soil type and amount of water available
- what else is growing there
- what infrastructure is around like underground services and overhead powerlines

Think about where the plant naturally grows and the conditions at your site. Make sure you plant the right plant in the right place. Think also about how big the plant will get. Think about the environment as you plan, will your project cause any erosion, will any of your plants escape and become weeds, will the fertiliser run into the creek?

Make a plan on a big piece of butchers paper. Work out what species of plants are needed and draw them on to the plan. If you are going to be installing irrigation you could do the irrigation plan at the same time.

When you are ready to dig the holes use the plan to walk around and mark the position of each plant with coloured marking paint. Flagging tape can also help for marking out areas.

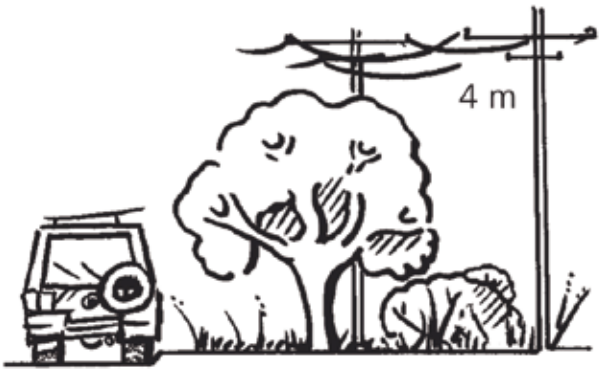
When you are finished the project keep the plan so you can remember what was planted and where.

PLANTING TREES ON STREETSCAPES

Streetscapes include the street, nature and median strips and in some cases the front yards of houses. Any trees planted on nature strips and in other public places belong to local councils. The nature strip is also likely to contain a number of services such as telephone, sewer or electricity. You should contact your local council before you plant, prune or remove any trees on nature strips.

Any tree planted under a power line should have a maximum height of no more than 4 metres. Trees taller than this and those with large spreading canopies can reach into power lines and become safety hazards, especially in storms.

Local councils have guidelines available and normally are available to provide free advice.



1G. SITE PREPRATION

WEED CONTROL

Weeds can threaten the survival of new plants. Weeds smother new plants as they compete for light, moisture and nutrients. Weeds can also support fires which may burn or kill seedlings.

Before planting ensure the site to be planted is weed free to avoid competition with your new plants. Its best to kill the existing weeds to prevent weeds from seeding so you don't get any more weeds growing. Ideally all weeds should be cleared within a one metre radius of each plant. See the learning guide for *Treat Weeds* to find out more about weeding.

Weeds can be controlled by many means including:

Physical methods: These are the oldest forms of weed control. They don't usually require expensive machinery or equipment and they're less polluting to the environment and non-toxic to the operator. They are probably the most cost effective method for small areas. Physical methods include hand pulling, slashing, mowing, mulching etc. The wet season is a good time for hand pulling as weeds are actively growing and the soil is softer, making removal easier. It is important to make sure the roots are removed as some species can regenerate from underground roots.

Chemical methods: Herbicides should be used as a last resort. Aim to kill weeds outright the first time. However you will still need to follow up in case there was seed in the ground or you missed a few. Knowing when to spray is as important as the type of herbicide used. Use only registered herbicides, follow all directions on the labels and seek advice from local experts or garden centres. The various methods of application include foliar spray, basal bark applications, cut stump and soil applications.

SOIL PREPARATION

You will need to look at the soil and determine if it is satisfactory for plant growth and if anything needs to be done about it. If you are going to use a tube planter you will need to rip the soil first.

In poorer gravelly soils and very rocky soils, extra soil or compost may have to be brought in to replace some of the poor soil so plants can get a good healthy start. For small areas rip the area then mix the new soil or compost in to improve the poor soil, especially the water holding capacity. In garden beds its best to spread the compost over the whole area. For larger sites backfill the holes with compost or better soil. In really rocky sites with large underlying rocks it might be easier to move the planting holes to less rocky sites.

Clay soils with poor drainage are often sticky and wet. The soil sticks to boots and digging equipment. This type of soil can be improved by adding gypsum or compost to improve the aeration and drainage.

Sandy soils often cannot hold a lot of water and have poor plant food supplies. These soils can be improved by adding composted organic matter to the planting hole.

NOTE

Selecting native plants that come from the local area will help reduce the need to change the soil conditions as local native plants should be well adapted to local soil conditions.

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?**
SUN EXPOSURE Risk of: Heat exhaustion and sunburn 	• Drink plenty of water • • •
USE OF MOTORISED EQUIPMENT Risk of: Injury from being caught in machine 	• Don't wear loose fitting clothing • • •
TRENCHES AND HOLES Risk of: Sprained ankle from falling in hole 	• Mark holes with flagging tape • • •
LIFTING THINGS Risk of: Injured back 	• Use a wheelbarrow to move things • • •
BITING INSECTS Risk of: Bites and stings 	• Use insect repellant • • •
	• • • •

DIGGING HOLES

2

Before digging any planting hole make sure there are no services underground. For instance telephone, power and water lines are often located underground. Your council or ESO (Essential Services Officer) may have information about underground services.

DIAL BEFORE YOU DIG

Before planting a tree on your nature strip, call 'Dial before you Dig' service to make sure you won't dig into underground pipes and cables.

Phone: 1100 Fax: 1300 652 077

DIAL BEFORE YOU DIG www.1100.com.au

Digging with a shovel

Motorised auger

Bob cat auger

2A. EQUIPMENT USED

Holes for planting trees can be dug with a wide range of tools such as shovels, spades, trowels, augers, back hoes, rippers etc.

Manual augering

2B. HOW DEEP A HOLE?

Holes for planting trees should be dug twice the size of the plant's container. This ensures the roots have room to expand out very quickly and allows water to penetrate around the roots of the newly planted trees.

It is important that the edges of the hole should not be smooth as the roots may find it difficult to penetrate. This is often a problem when digging holes using motorised augers. Augers tend to leave the sides of the holes smooth and shiny. If this happens rough up the sides of the hole with a spade or crowbar so they are no longer smooth.

2C. SAFE DIGGING

Be careful when digging holes with a spade or shovel as wrongly twisting and turning with a load of soil can easily damage your back.

ACTIVITY

With your trainer practice the correct lifting and turning technique when using a long handled spade

ASSIGNMENT 2 A2

PLANTING PLAN

Complete this planting plan. When finished, carry out any site preparation needed. Then use the plan to mark all the holes out on the ground with marking paint, and then dig the holes. Don't forget to do a proper risk assessment of the site before starting. Make sure you mark the holes or tape off the area so no one falls into them.

Draw a plan of your site and where the plants are to go.

Trees or shrub name	Number to be planted

INSPECT AND PREPARE THE PLANTS 3

Root bound

3A. INSPECT PLANT AND ROOTS

A potted plant is ready to be planted out when it has healthy leaf growth and roots just showing at the base of the pot. You may need to gently squeeze the pot and slide the plant out to inspect its roots.

Generally the smaller the container and hence the younger the plant, the better. Avoid choosing large plants that may have been sitting in their pots for a long time as they will probably be root bound and will never perform well.

If the plant is root bound or shows signs of pests or diseases talk to your trainer about what to do.

ACTIVITY

Check on a range of plants in their pots, discuss any problems with them.

3B. WEEDING AND WATERING

Any weeds should be removed from the pot and disposed of before the planting.

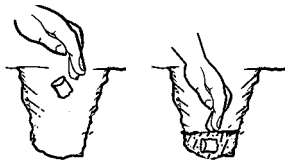
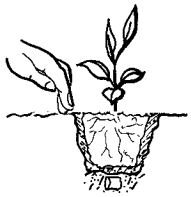
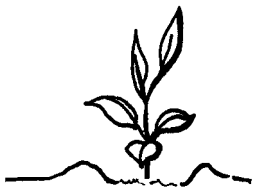
Make sure the plants have been well watered before the planting activity.

4 PLANTING AND FINISHING UP

4A. PLANTING

BY HAND

The following steps will help ensure successful growth:

	• Dig your hole following guidelines explained in Section 2.
	• Half fill the hole with water and let it soak in before planting.
	• If necessary place a slow release fertiliser tablet into the bottom of the hole, cover with a centimetre of soil and ensure it does not come into contact with the roots of the plant (remember some plants don't like fertiliser at all).
	• Give the pot a light squeeze, place hand over the pot, turn it upside down and tap firmly on the base to loosen plant.
	• Place the plant in the hole with the soil level the same as it was in the pot and back fill with moistened soil. Firm down gently to remove air pockets and ensure good root/soil contact (if the soil is compressed too much it will hinder root growth).
	• Make a 'dish' around the plant to collect rainfall and water from irrigation.
	• Water and mulch the plant.

NOTE

Long-stem planting is a different method of planting trees where most of the plant stem is actually buried in the soil – it might be a good option for rainforest or river plantings – something to think about and then research when planning your project.

Removing plant from the pot

Planting the tree

WATER THE PLANT

It is very important to water the plant in well immediately using a hose or watering can and then keep watering regularly for the first few weeks.

If planted in the wet season, make sure the plants get some water if it stops raining for a while, and for the whole of the next dry season. Some plants will need watering for longer than this.

If planted in the dry season you will need to install a watering system to keep them regularly watered until the rains come.

If you don't have mains water you may need to consider a temporary water supply like drums that you fill with a water tank. See the learning guides for *Carry Out Natural Area Restoration Works* and *Install Micro-irrigation Systems* to find out more about watering systems.

NOTE

The soil needs to be ripped first so it is soft enough for the tube to work properly (unless the soil is naturally soft).

PLANTING WITH A TUBE PLANTER

Trees and shrubs grown in tubes can also be planted using a tube planter such as this *Pottiputki*. This method is often used when you have to plant large numbers of trees and shrubs. The tube planter is pushed into the soil and a plant is dropped down through the centre of the tube directly into the soil. You can then remove the tube planter and firm the plant in and water.

Use the silver lever to close the beak.The beak should be shut when you push the tube into the soil.

Push the beak of the tube into the ground.

Drop the seedling into the tube.

Open the tube by pressing on the lever with the circle at the end with your foot – the beak will open and let the seedling fall through into the ground.

Remove the tube by lifting it over the seedling, then firm the soil around the stem base with your boots.

This method is usually for large scale plantings which rely on wet season rains for establishment.

However, especially for smaller plantings, you may need to water the plants in if the rains haven't come yet.

The *Pottiputki* bucket can be worn over the shoulder to carry seedlings as you plant.

4B. FERTILISING, MULCHING AND GUARDS

FERTILISING

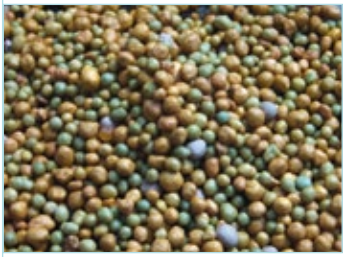
Fertiliser helps plants grow to be strong and healthy. Native plants often require less fertiliser than exotic plants. Fertilising tropical plants is however often a necessity as the high volumes of rain over the wet season quickly leach the soil of nutrients. Good results can be seen after about 3 weeks with the addition of a composted organic fertiliser such as pelletised chicken manure or liquid organic fertilisers.

Organic fertiliser

It is best to fertilise lightly 3 times a year rather than being heavy handed and applying one large application. The best months are April, July and October. All fertiliser applications should be followed by adequate watering.

Applying fertiliser

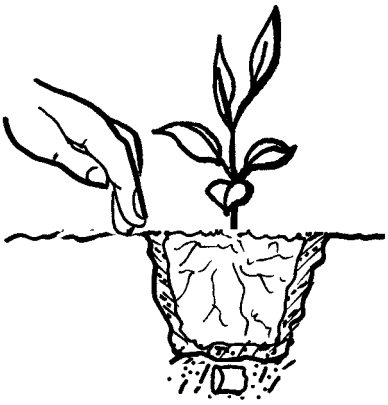
Some native plants like grevilleas require no fertilisers at all. Other natives don't like excessive amounts of phosphorous - use a low phosphorous slow release fertiliser designed specifically for native plants.

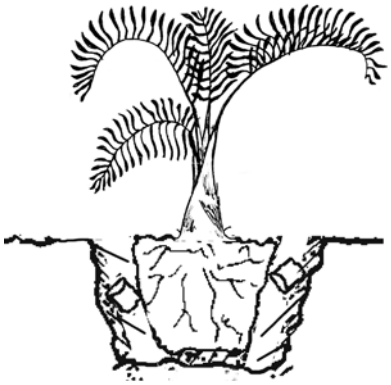


Slow release fertiliser for native plants

When planting, a slow release fertiliser tablet can be placed out of direct contact with roots at the bottom of the planting hole (first diagram), or for bigger plants use two tablets and place them either side of the root system (second diagram). In very poor soils also place about 100g of organic fertiliser on the top of the soil.

Slow release fertiliser tablet (put in hole when planting)





Use all fertilisers responsibly and wherever possible it is best to use an organic fertiliser. Use combinations of manures, compost, green manures as well as mulches that can also act as fertilisers.

MULCHING

Why mulch

Mulching is an important part of establishing and maintaining your planted trees. The benefits of mulching include:

- helps water to absorb and stay in the soil
- improves the fertility of the soil
- improves soil structure and erosion control and prevents soil crusting
- helps control weeds
- helps with soil temperature control to support balanced populations of worms and good bacteria
- reduces maintenance by reducing lawned areas
- greatly improves appearance of gardens

Types of mulch

Mulches can be any material placed over the soil surface and fall into two categories:

- **organic** such as grass clippings, leaves, palm fronds, newspaper, biodegradable mulch mats, hay, straw, woodchips, compost, and aged animal manures mixed with compost

- **inorganic** such as woven plastic weed mats, crushed rock, pebbles or synthetic material

Remember that low spreading ground covers can provide colourful living alternatives to traditional mulches.

How much mulch?

Plants from the wetter monsoon forest areas need relatively thick mulch as they often have shallow roots which need to be protected from hot sun and the resulting high soil temperatures and drying out of soil moisture. Up to 150mm depth of mulch can be applied.

Some of the more drought hardy acacias and eucalypts from open woodland areas still benefit from mulching but can get away with lesser amounts of around 50mm thick. Don't mulch too thickly with these hardy plants as this can cause other problems such as root rot.

Some softer mulches break down very quickly in the tropics and should be renewed at least twice a year to maintain a reasonable thickness. It is better to reapply mulches after they have broken down rather than pile too much on.

When to mulch

Mulch your trees straight after planting. Top up mulching can be made at any time throughout the year but is very useful at the end of the wet season to help to retain the soil moisture over the coming dry season.

Mulching problems to be aware of

1. Some mulches can pack down so tightly that water is prevented from entering e.g. lawn clippings or paper. Shred paper first and compost all clippings or spread them out very thinly.

2. Biodegradable mulch mats are useful for weed control and easy to use but don't provide the full range of benefits to plants. Don't use black plastic as a garden mulch as it will prevent the soil from breathing.

3. When some fresh mulches break down in the soil you can get nitrogen draw-down. This is where nitrogen is used by bacteria to break down the mulch. Look out for yellowing of the oldest leaves. Prevent this by composting the mulch or by adding a good supply of organic fertiliser under the mulch before it is laid.

4. When some mulches break down they release heat. Thickly applied fresh lawn clippings get very hot when they break down and can burn tree roots from too much heat. Its best to compost lawn clippings before using them or at least spread them out very thinly.

GUARDS AND STAKES

Guards

Tree guards are useful to protect against pests like feral animals, cattle, pets and kangaroos. They also can offer some protection for young plants in strong winds. Tree guards also help to protect trees from vandalism or accidental damage from mowers and brushcutters. You can buy tree guards or make your own.

Stakes

Why stake: Staking plants is not normally recommended as well grown, healthy trees are strong enough to support themselves. However stakes may be used to mark trees if they are in areas likely to be trampled or mowed. Occasionally they are needed to support important plants. Remove all stakes as soon as they are no longer needed.

How to stake: Make sure the stake is not driven into the root ball of the plant. If using to support a plant use 2 stakes – this will give greater support and is less likely to damage the plant (3 can be used for very windy places). When tieing off plants use material that will not cut into the stems of the plant (hessian strips, old nylon stockings or wire/rope that has been threaded through a hose).

4C. FINISHING UP

DISPOSAL OF WASTE MATERIAL

After tree planting 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, stakes, mulch, and plant debris. It is best practice when finished to leave a completely clean site free of rubbish.

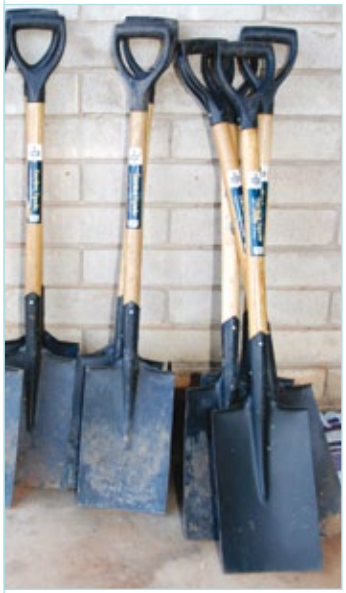
Methods of waste disposal could include:

1. **Organic waste**: mulch and composting.

2. **Inorganic waste:** plastic/metal/paper based materials maybe recycled, reused or returned to manufacturer.

Always clean up and reuse or dispose of your old pots.

TOOL MAINTENANCE



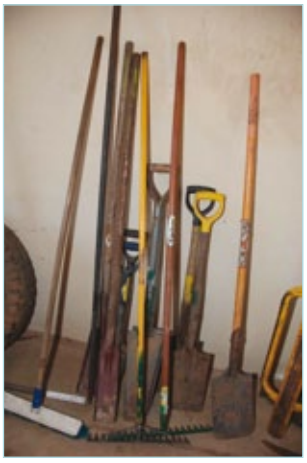
To make the next job easy and to prevent personal injury it is very important to keep tools in good condition. Follow the steps below:

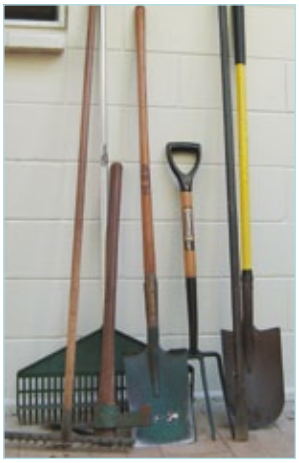
- Wash all tools of mud and dirt, and oil any metal parts to prevent rusting. Steel wool and a light oil will remove any surface rust.

- 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.





ASSIGNMENT 3 A3

CARRY OUT PLANTING

Carrying on from Assignment 2, work with your trainer to select the tools, plant trees and shrubs and clean up the site. When finished fill in this report.

What did you do to get the site ready?

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What tools and equipment did you use?

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How many plants did you plant?

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What types of mulch and fertiliser did you use?

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How are the plants watered?

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.....

.....

What did you do to clean up the site?

.....

.....

.....

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, *Plant Trees and Shrubs* **you will learn how to:**

- GET PREPARED
- DIG HOLES AND PLANT TREES AND SHRUBS
- MULCH, FERTILISE AND CLEAN UP

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