INFORMATION SHEET 46

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TREE PLANTER'S GUIDE

R. J. EDMISTON

Introduction

Trees are an essential part of our environment. Apart from providing the community with a range of wood products, trees help purify the air, moderate extremes in temperature and control the movement of salt in soils. In rural areas trees are planted for aesthetic purposes, shade, shelter belts, erosion control and to lower the water table in areas susceptible to waterlogging.

The alteration of the environment in this state, brought about by farming techniques, affects the natural regeneration of trees left after clearing. The absence of fire means that the ashbed conditions, so necessary for good natural regeneration, are not present, and the competition from crop and pasture proves too strong for most seedlings that do germinate. Those few that do manage to survive are frequently grazed out by stock. As the trees remaining after clearing reach a mature age, they die out leaving a gap in the landscape. Droughts, salinity, cyclonic winds, road widening programmes and expansion within country town sites further decrease the numbers of trees. Thus in order to ensure the future existence of indigenous trees in rural landscapes it is *imperative* that *regular* planting programmes within shires and on farming properties are adopted to replace these dead or dying trees.

Selection of Species

The selection of species will depend on the purpose for which the trees are required. The Forests Department publishes a leaflet of *Trees for Agricultural Areas* which gives rainfall requirements, tree heights, preferred soil types, a description of the tree and its recommended use. This pamphlet is available from all Forests Department offices and is a useful guide for tree selection.

Before introducing trees to an area, it is necessary to examine the potential of the local species. These trees have developed under the climatic conditions of the area and, providing they are considered suitable for the purpose, are the obvious choice.

Another point in their favour is that, if they have shown no sign of severe insect attack, it can be reasonably assumed that a natural balance exists. This may not be the case with introduced species.

Frequently the local species are not considered because their rate of growth is slow. While this is so with some species, most native trees when grown under cultivated conditions, where competition is excluded, and some fertiliser is applied, respond with a much faster rate of growth.

Where the local species do not satisfy the requirements then species from outside the area will have to be chosen. It is important that the selection is made from trees occurring in similar soil types and growing under identical or lower rainfalls. If it is decided to introduce species more tolerant to drought than the existing native trees, the selection will need to be from lower rainfall zones.

Careful consideration also needs to be given to the selection of trees for growing in town site areas. The use of large trees in confined spaces or under powerlines leads to the necessity for a regular pruning programme which, as well as being costly, is deleterious to the health, longevity and appearance of the tree. In these situations trees of lower stature are more desirable, will furnish good shade and are far less costly to maintain. In areas of unrestricted space, larger trees can be planted to furnish the height levels which are a necessary part of effective landscaping.

Size of Planting Stock

The ideal sized tree for establishment under natural rainfall or low watering regimes is the standard 10 cm pot size as supplied through the Forests Department nurseries. Under natural conditions trees establish themselves by firstly developing a deep penetrating root system to supply the moisture requirements of future growth. The larger the tree planted out the less chance it has to re-adapt itself to these conditions. As a general rule larger-sized planting stock is less capable of producing a deep root system which will sustain the tree during times of drought. In addition, the larger foliage area of such "advanced stock" places greater moisture stress on the plant and consequently the chance of successful establishment without frequent watering is minimal.

Another problem with advanced eucalypt stock is the increase in the chance of root coiling. The growth habit of eucalypts is to develop a tap root system which will coil if left in a container too long. After planting the tree grows and the roots thicken. The coiling develops with diameter increase into a restriction which can result in a severe setback or even strangulation of the tree, depending on the severity of the restriction. It can also make the tree prone to windthrow.

Site Selection

Trees grow on a wide range of soil types and under varying climatic conditions and it is possible to obtain a tree that will grow on all but the most inhospitable sites. The type of growth achieved, however, will reflect the

severity of the conditions under which it grows. In shallow soils with rock or hardpan close to the surface, one cannot reasonably expect to grow a large shade tree. The trees that occur in these areas are typically low bushy or scraggy mallees. When larger growing species are planted under these conditions, those which are able to establish themselves are likely to be stunted or else more prone to drought death or attack by borer or other insect pests due to a lack of vigour.

Farmers like to keep their best land for cropping, but trees, like crops require good soil and thorough preparation for successful establishment and a long healthy life.

Site Preparation

The extent of site preparation is largely dependent on soil type, but all grass, pasture or native shrub competition must be removed. This is best achieved by ploughing twelve months prior to planting and again the following autumn or winter (depending on rain) to eliminate any further germination. If erosion is a problem then the grass can be killed with a suitable weedicide and then ploughed the year of planting. Subsequent treatment may be necessary before the end of winter in which case cylinders should be placed over the trees to prevent damage from spray drift. Check first with the Department of Agriculture to ascertain the best weedicide for the appropriate grass.

In friable soils of good depth no additional preparation is necessary. At planting time, a hole sufficiently large to accommodate the teased root system is dug and the soil gently filled back in, so that the roots are not turned upwards or coiled.

If the trees that you have purchased have been in the container too long and spiralling of the tap root is evident try to straighten the root. If it springs back after release then it will be necessary to remove it completely with a pair of secateurs.

In heavy soils or shallow soils over clay, it is necessary to penetrate the clay so that the roots are able to explore a larger area for moisture and nutrients. Holes dug in clay only form a dam which will hold water during excessively wet periods and rot the young roots. Similarly, holes prepared with a post hole digger in heavy soils act like a pot and the glazed sides restrict root movement. Ripping is necessary in these soil types and should be carried out when the ground is moist. The soil should be ripped to a depth of at least 450 mm and preferably to 1 m if possible. Spacing between rip lines should be the same as depth of penetration. Three lines are ripped for each row of trees and the trees planted in the centre rip line. An alternative is to rip and cross rip at the point of planting. Ripping will more than compensate for the added cost by providing faster and healthier growth.

Before planting all soil clods need to be broken in the area where the tree is to be planted, so that a loose friable soil can be placed around the roots to prevent the formation of air pockets.

Planting Time

Planting time will differ between areas and depending on location. In areas of reliable winter rains, planting should take place once initial rains have penetrated the soil profile and follow up rains can be reasonably assured. This gives the plant time to establish itself prior to the cessation of the winter rains.

In drought areas where rainfall is unpredictable planting should be carried out in the cooler months. The soil will need a good watering prior to planting, and subsequent waterings until such time as reasonable rainfall is received or the tree established.

In drought areas where watering has to be maintained for some time, planting programmes need to be restricted to a manageable level.

In low-lying wet areas, where flooding can be a problem by the end of winter, early planting is not advisable as young trees in saturated soils will die. In these locations mounding can be practised to raise the soil above the water, and the trees planted on the mounds. An alternative is to wait until the water level has dropped below the soil surface.

Watering

It is difficult to specify the watering needs of a plant since factors such as rainfall (both time and quantity), soil type, temperature, drying winds, plant size and water quality will control the need or frequency of watering. During years of normal rainfall, in moisture retentive sites, and where the rainfall is above 500 mm, trees can be established under natural rainfall conditions. In sandy soils of the same rainfall and in all soil types of lower rainfall, watering during the first summer will be necessary. In all cases supplementary watering during the first summer will ensure a higher success rate and faster initial growth, extra water will further hasten growth, but is likely to create a tree susceptible to drought stress, once the watering is discontinued.

As a general guide water should be applied in heavy, widely spaced applications rather than light frequent ones which tend to create a surface root system. Where the salinity level of the water is relatively high, the accumulation of salts in the upper soil profile can be avoided by infrequent but deeply penetrating waterings.

Applications of water may be necessary at fortnightly intervals to establish a tree, but then may be gradually tapered off to monthly intervals and cease when the winter rains start. In drought areas additional watering may be required after the first year but should only be applied when the tree is beginning to show signs of stress. Each application should not be less than 20 litres.

Water can be applied by forming a saucer around the base of the tree or else by means of a pipe inserted beside the tree. The pipe can be plastic, concrete or earthenware and needs to be 600 mm in length and 150 mm in diameter and should protrude 150 mm above the soil surface. Where the saucer method is used care should be taken not to expose the roots by concentrating a strong jet of water on the saucer. Any exposed roots should be covered and breaks in the saucer rim repaired by raking soil from outside the saucer.

Where trickle irrigation is used it is more satisfactory if the water is applied at depth through a small pipe inserted adjacent to the tree. This will encourage a deeper root system.

The eradication of grass competition should be maintained for at least two years. This can be achieved by cultivation, the use of an appropriate weedicide or mowing.

Ordering

Once the number and species of trees have been decided upon, an order should be lodged at the nursery. If left too late the desired species may not be available. Large orders should be submitted prior to the nursery sowing period in September to ensure supply.

Forests Department nurseries raise one year old plants. These are produced in 10 cm pots and the size will vary according to variety.

No trees will be despatched to within the Perth Metropolitan Area nor to any destination outside Western Australia.

Planting the Tree

1. On arrival the trees should be thoroughly watered and placed in a sheltered position until required for planting.
2. A hole, sufficient to accommodate the teased root system, should be dug in the prepared moist ground.
3. Place your fingers either side of the tree, invert the pot and tap the edge firmly on a solid object. The plant will slide easily out of the pot.
4. Gently tease the side and basal roots until they hang loosely. If the tap root springs back into a coil, remove it with a pair of secateurs.
5. Position the plant in the centre of the hole at a depth slightly deeper than it was in the container. Be careful not to turn the roots upward or allow them to coil.
6. Fill the loosened soil gradually back into the hole and firm, using your feet.
7. Build a saucer around the plant using soil away from the tree.
8. Water well to consolidate the soil and to eliminate any air pockets around the plant roots.

Fertilising

The addition of a fertiliser at time of planting promotes faster growth and increases the drought resistance of a tree. A number of forms are available.

At the time of planting slow-release fertilisers such as Agriform tablets and Osmocote can be used to advantage. These fertilisers become available over a period of time and consequently the chances of damage to the plant are minimal.

Potato Manure E and blood and bone in a 50/50 ratio is also suitable and is not damaging to the plant if applied at the rate of one handful per tree, scattered around the base or else placed in a hole, on the downward slope, 150 mm from the trunk of the tree and at a similar depth in the soil.

Agras 18:18 or 12:52 at a similar rate and speared into the soil as just mentioned, is used by the Forests Department for eucalypt tree establishment. As it is a strong fertiliser care must be taken to ensure it is applied correctly otherwise burning of the foliage or death of the tree will result.

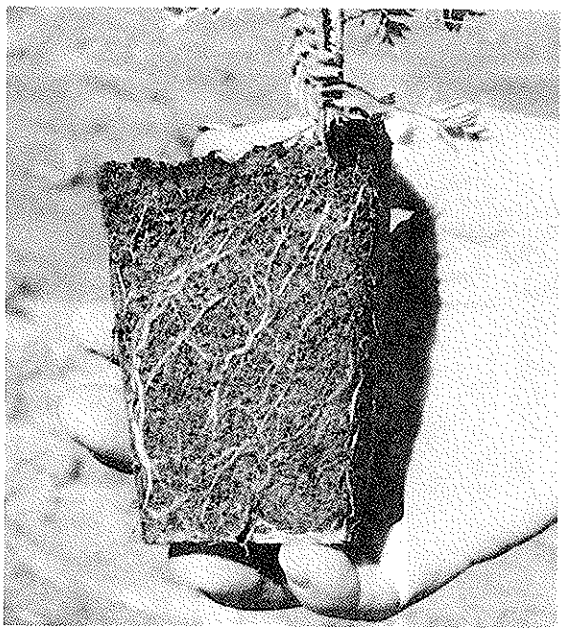
Aftercare

The lower foliage and branches on newly-planted trees should not be removed. The foliage is the food factory of a plant and its retention will promote growth, thicken the trunk and make the plant more stable.

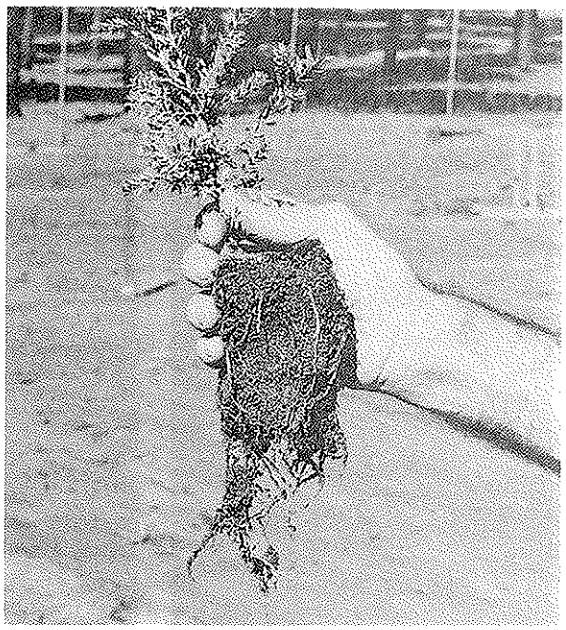
It is important that a follow-up programme of tree maintenance is carried out after planting. Weed competition must be eliminated and a constant check maintained for any insect attack which might denude the tree of foliage. A book *A Guide to the Care and Cure of Australian Trees,* by P. W. Hadlington and J. A. Johnston and published by the N.S.W. University Press, supplies a photographic description of most insect pests encountered and the method of treatment. It is a worthwhile investment for most tree growers and is available at a reasonable price.

POINTS TO REMEMBER WHEN PLANTING A TREE

The first five photographs illustrate points well worth bearing in mind when planting a tree. The last four photographs in the series illustrate a typically bad specimen for planting and the results of root strangulation.

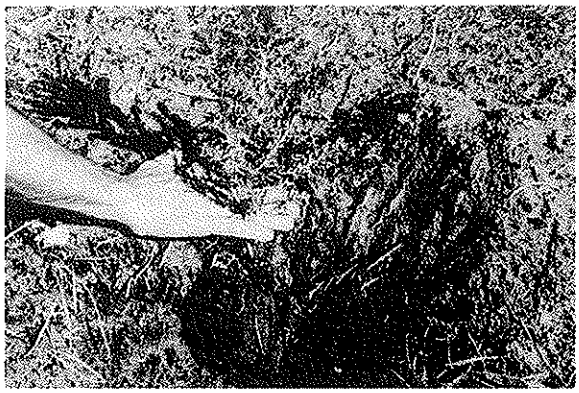


▲ 1. Ideal specimen for planting, with a full but not congested root system

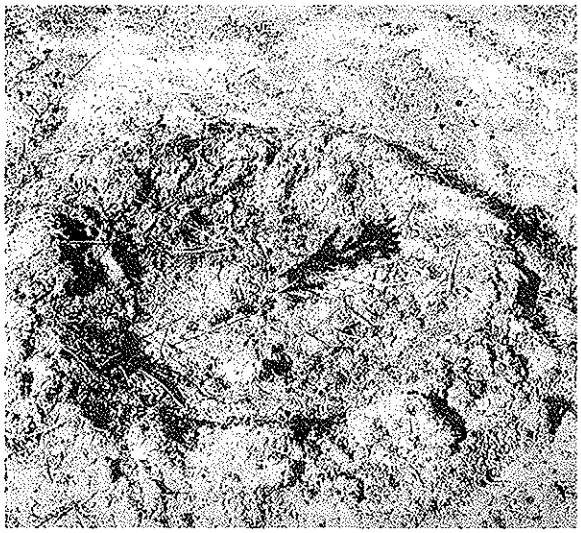


▲ 2. Teased root system

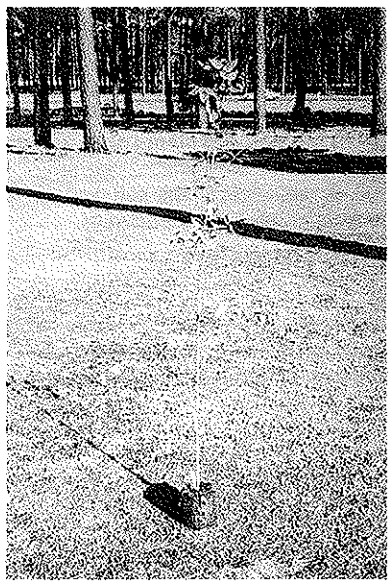
▲ 3. Firming soil around plant



▲ 4. Depth of planting

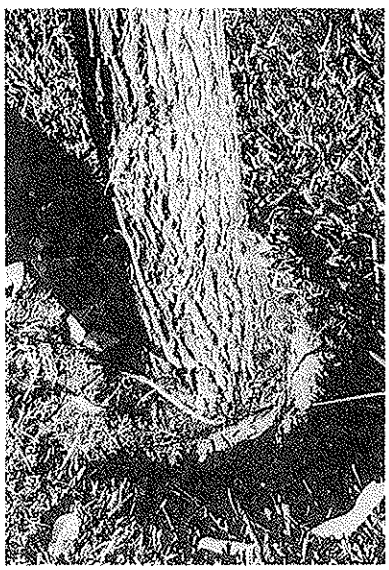


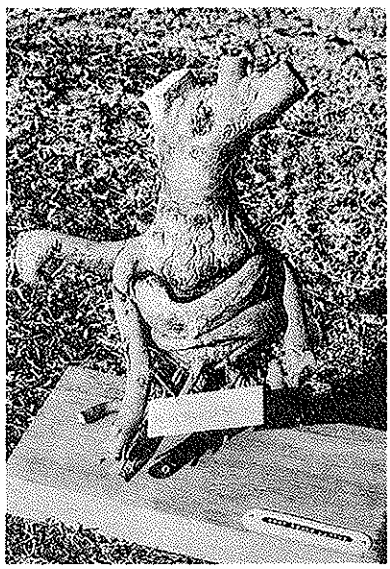
▲ 5. Saucer completed



▲ Bad specimen for planting:

- Plant tall and spindly.
- Root system congested.





▲ Root strangulation.