

Site preparation vital to tree success

CAREFUL site preparation is critical to the survival rate of seedlings planted either by hand or machine.

Success depends on the attention to detail at each stage of preparation and planting.

The time spent planning and preparing the site will save both time and money in replacing losses later. The seedling will be torn from its 'friendly' environment and transplanted to a more demanding site so they must be allowed to get established quickly if they are to survive and thrive through their first year in the real world.

Establishment techniques must be decided on far enough in advance of planting to allow for adequate site preparation. The physical aspects of the site such as the salinity status of the soil, the moisture content and the soil type must be taken into account.

Weed control will play a large part in the success rate of the programme. Without exception native tree and shrub seedlings are sensitive to competition from other plants. The vigorous annual species of grasses and broadleaf weeds present the greatest threat.

Deep ripping

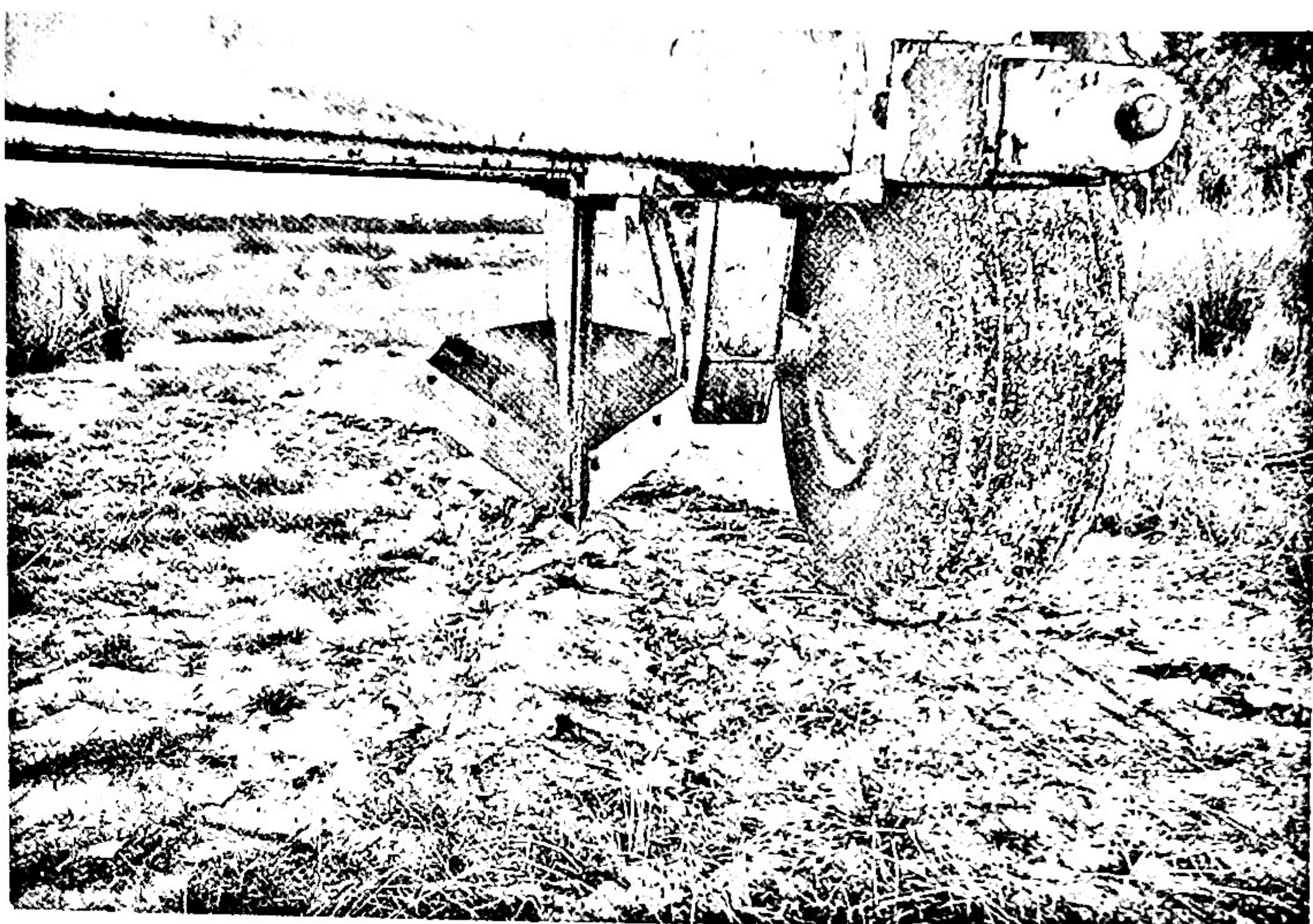
Deep ripping to allow moisture to penetrate the soil should be carried out during autumn of the year before planting.

This creates the maximum shattering of any compaction layer to encourage the roots of the young trees to follow the moisture down through the soil.

The young trees need to develop a vigorous root system to survive the first summer.

Soil should be ripped to at least 45cm and down to one metre if possible with the machinery available.

Deep ripping can be done with a single tine but it will be more effective with a



A wing or wide foot plate will assist soil fracturing when deep ripping.

multi-tined implement. When a three-tined implement is used and the trees are planted along the centre rip line, the plant roots are encouraged to spread out towards the moisture permeating through the two outer rip lines.

On sloping country or steep areas the rip lines should be made on the contour to reduce erosion.

Ripping may not be necessary on new ground without a compaction layer but if it is a shallow topsoil over a clay base deep ripping in autumn may be worthwhile.

On new land a light cultivation should be enough to prepare the ground and if it is left in a rough state it will provide some protection for the young seedlings.

Ripping more than compensates for the added costs by allowing rapid and healthier growth and it greatly reduces the need for summer watering.

The aim of deep ripping is to achieve the maximum amount of soil fracture to

increase the soil available for root growth. The addition of a wing or wide foot plate to the ripper tine will greatly assist soil fracturing.

Mounding

Young trees in saturated or highly saline soils will die unless the soil is mounded to allow them to get established.

Mounds can be made with a specially designed mounding plough or the disc attachments on some tree planters. A small disc plough or harrow operated back and forth along the rip line may be used as an alternative.

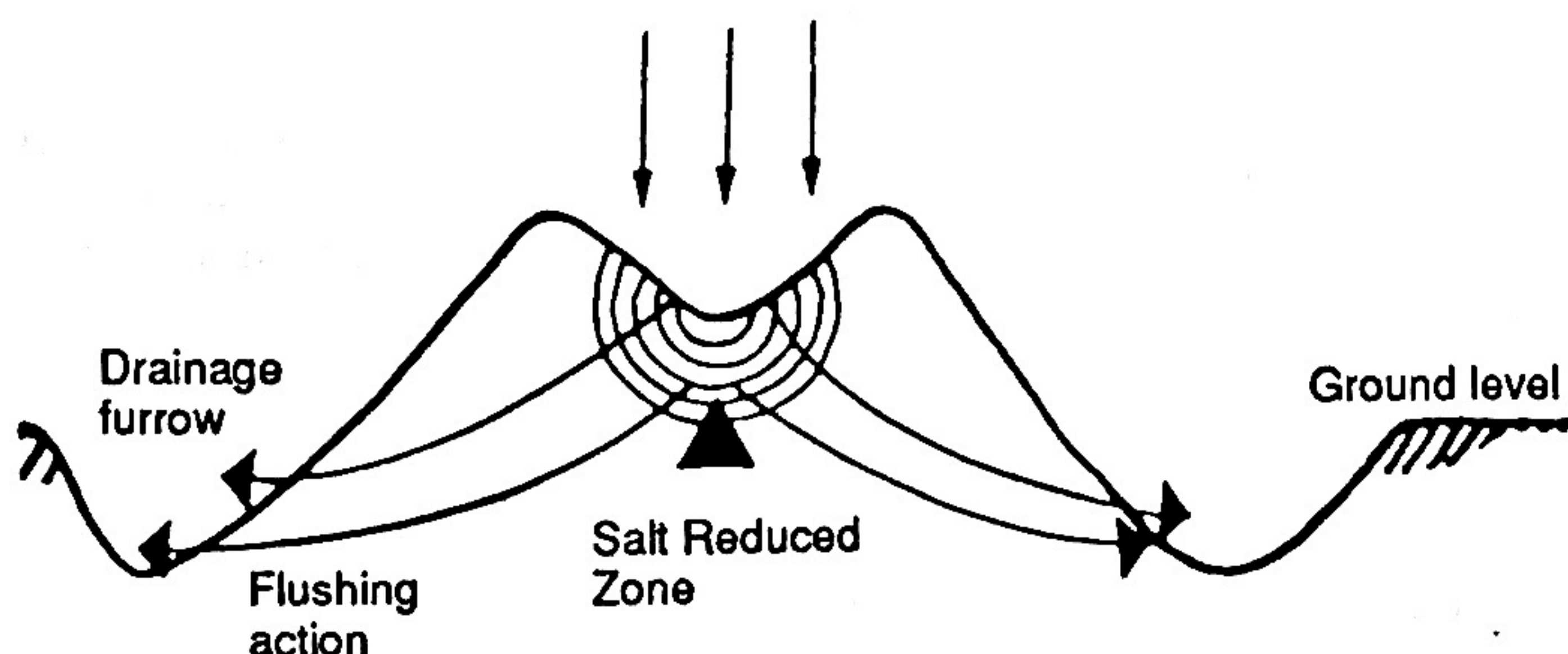
The benefits of mounding are illustrated in the picture below which shows the type of mound used in very wet areas to achieve good drainage.

Diagram 1 shows the mound design used in saline soils. The dishing at the top of the mound allows rain water to accumulate and as it drains through the mound it carries the salts with it, freshening the soil where the young tree will be planted.

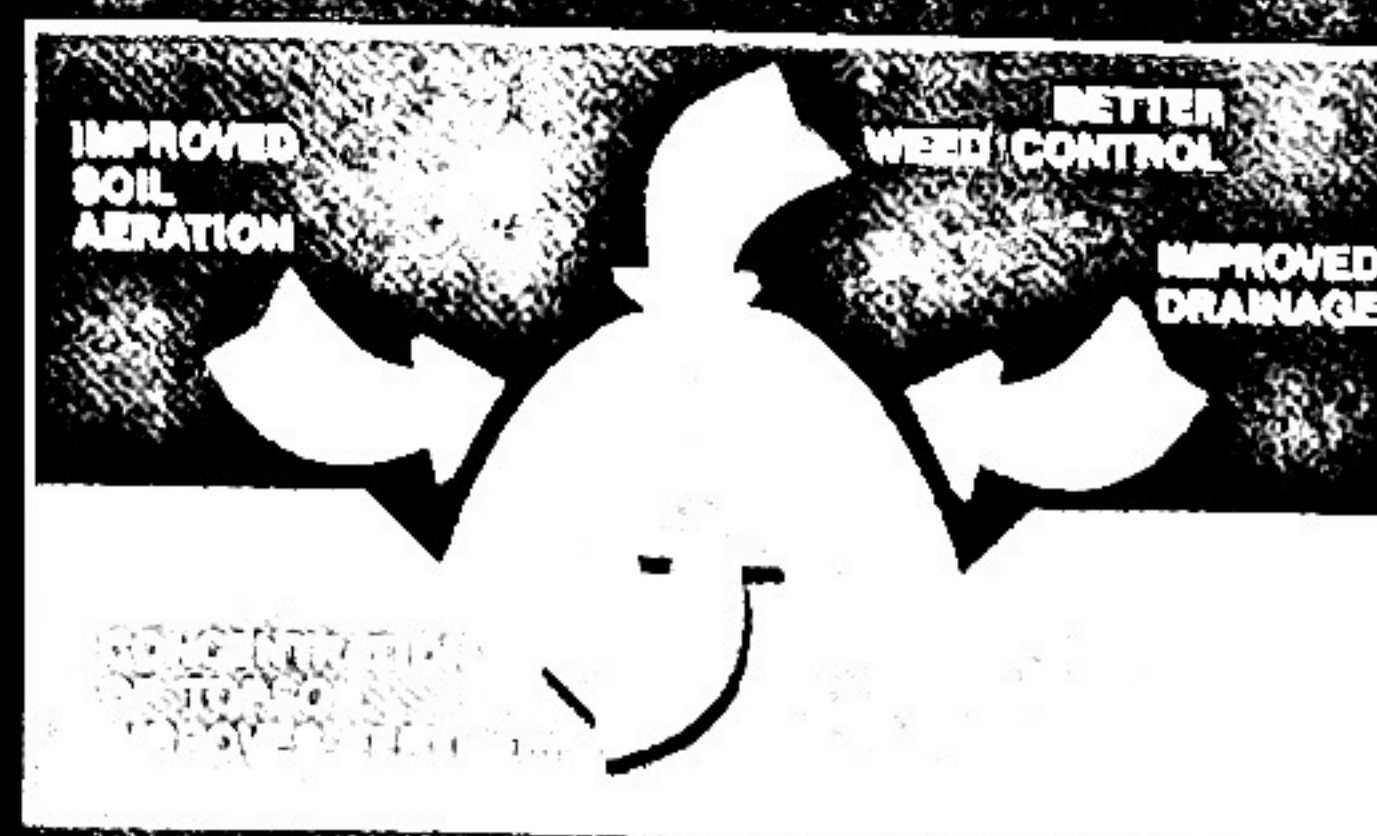
Both mound designs should be made at least six months before the trees are due to

Diagram 1.

Precipitation



ADVANTAGES OF MOUNDING



be planted. The mound will have time to settle, salts will be flushed, the surface will hold residual herbicides and the roots of the young tree will be encouraged to establish rapidly and vigorously. Graph 1 outlines the benefit of mounding to young pine trees during their first two years.

By the end of the second year trees grown in a large mound of 2.8m by 0.6m were nearly half as tall again as those planted out in paddock conditions.

In a commercial tree crop this rapid growth may mean the timber would be ready to harvest earlier and the timber cut per tree may be greater. This should account for the added cost of mounding.

Water harvesting

Trees planted in low rainfall areas will

have a better chance of success if water harvesting techniques are used which maximise the use of the limited rainfall.

One successful technique is to grade the surface soil at an angle along the contour and push it into an embankment.

The water will pond behind the bank and the trees are planted in the rip lines on the slope at the edge of the ponded water.

Diagram 2 shows this method which greatly enhances successful establishment.

An abbreviated form of furrow lining called pitting is another method of water harvesting successfully developed for low rainfall areas.

Rip lines are made before individual niches about two metres long and half to one metre wide are formed. When the rain

runs into the niche one tree per niche is planted at the bottom.

The technique of pitting is illustrated in plate 2 below.

Furrow lining

Where non-wetting sandy soils are a problem for establishing trees, furrow lining is often used as an option.

Furrow lining is carried out by deep ripping to at least one metre deep then digging the furrow as illustrated on page 35. This furrow can be 300mm deep and up to one metre across at the top.

The non-wetting soil on the surface has been removed and wettable soil at the bottom of the furrow is exposed which will allow rain water to penetrate the soil where the tree has been planted.

Wetters can be used in cases of very severe non-wetting soils.

This technique is used on very fragile soils so the furrow line should be made across the direction of any potentially damaging winds to reduce erosion.

If this is not possible the furrow line should have breaks in it to minimise the chance of wind erosion and crop can be grown in the gaps to provide a windbreak.

Furrow lining can be carried out using an implement with two opposing discs or one with a back blade which can be run up and back to create the furrow.

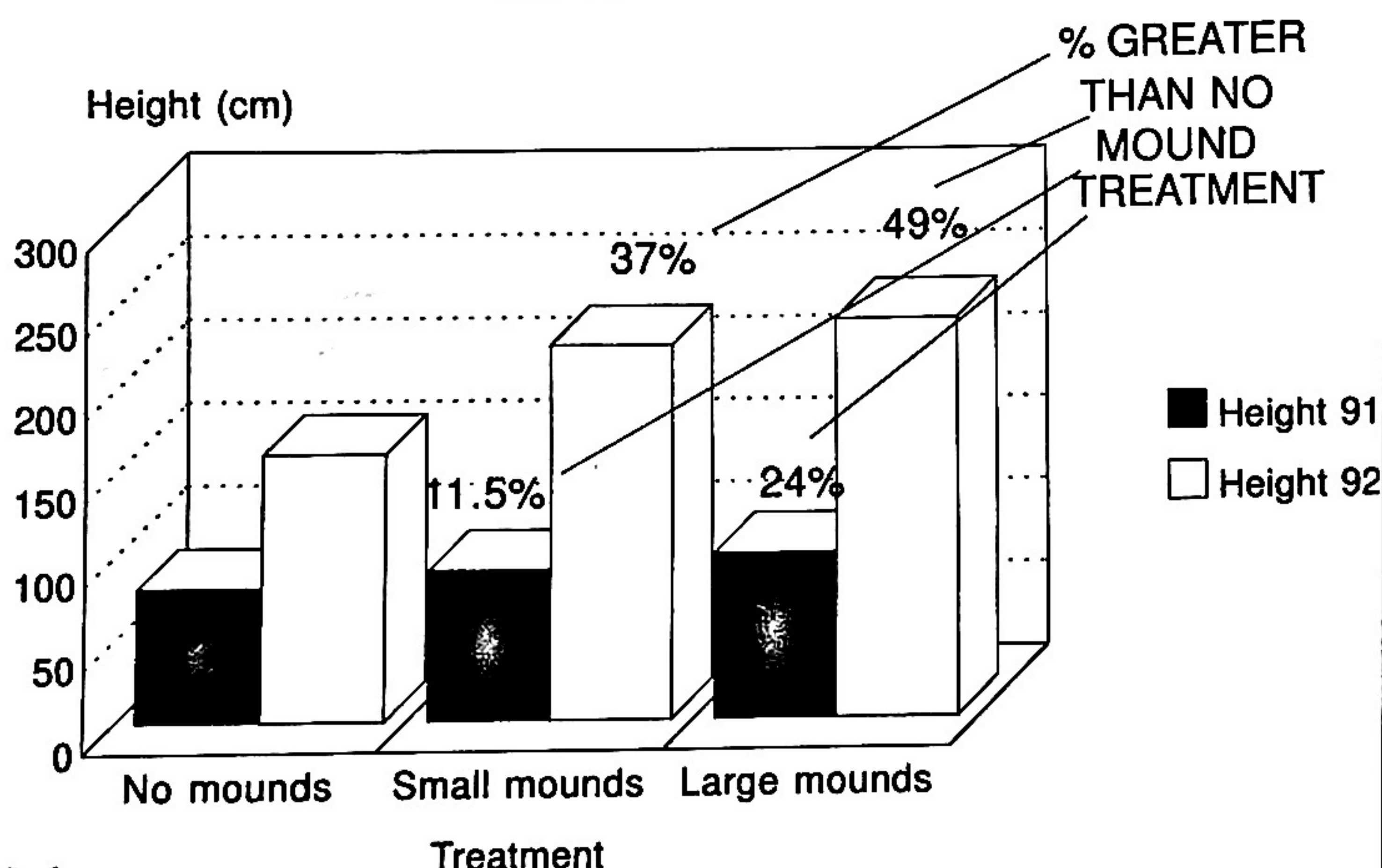
Time of planting

Timing the planting of trees and shrubs is just as critical as timing the sowing of a cereal or legume crop.

Generally autumn or early winter is the best time to plant out tubestock seedlings

Affect on tree growth of different size mounds

Height of P.Radiata



Graph 1.

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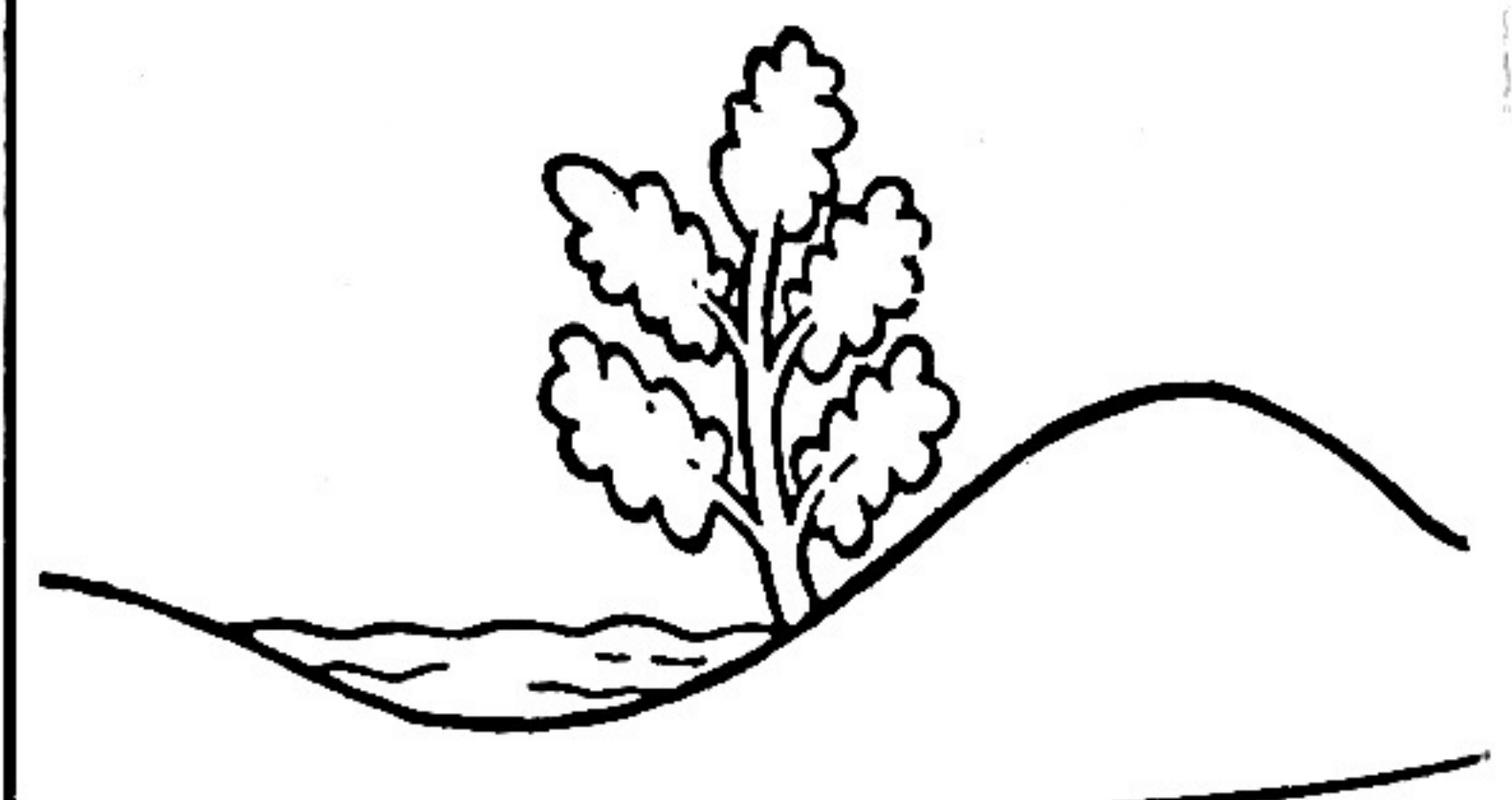
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Pitting is useful for low rainfall areas.

Diagram 2. Water harvesting



SITE PREPARATION

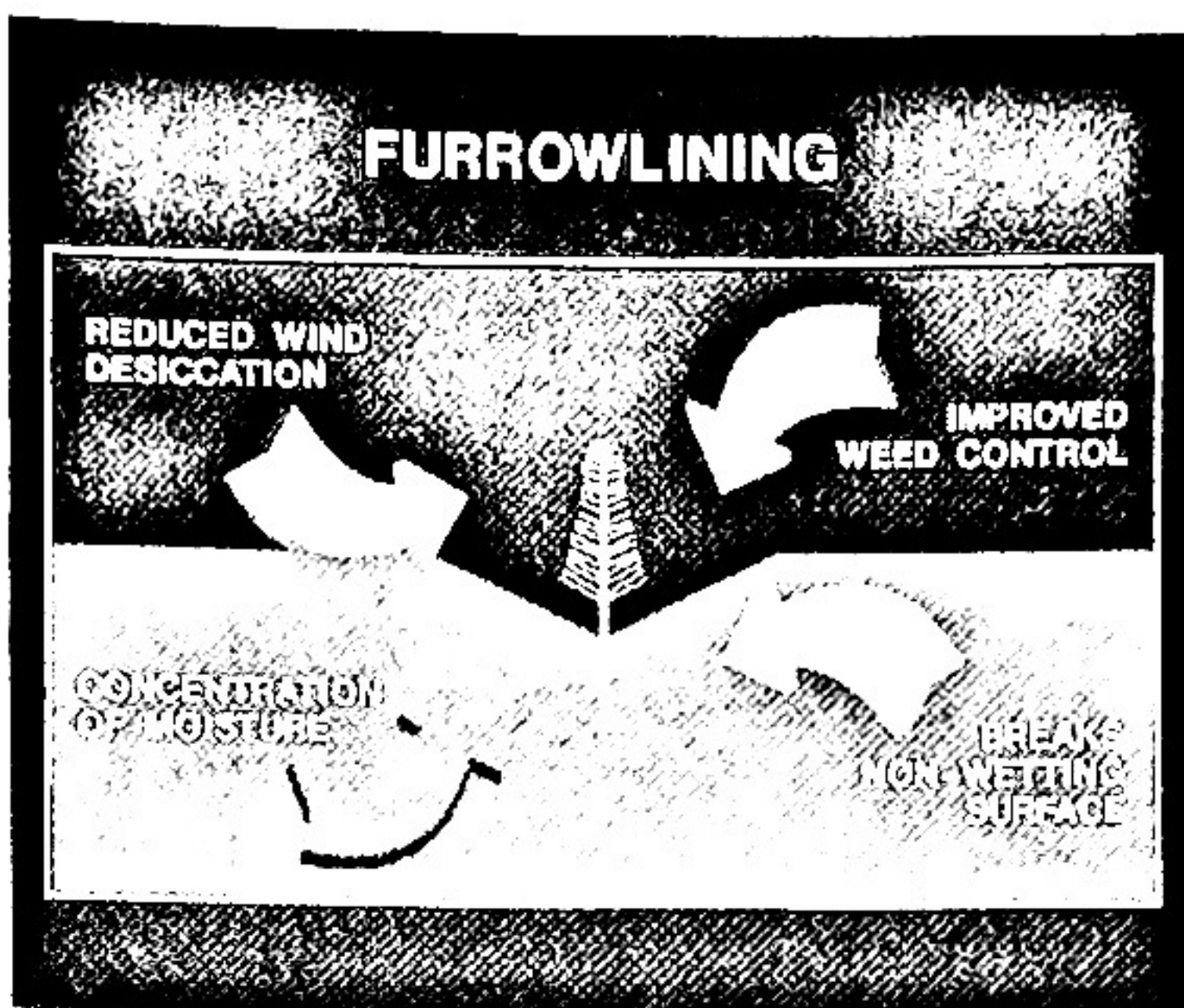
provided there will be suitable growing conditions following planting.

This allows the seedlings to become as well advanced as possible by the time any extremes in weather conditions arrive.

As a rule the lower the rainfall the earlier planting should take place provided the soil is moist.

This becomes a graduated process as the amount of rainfall increases, so areas prone to waterlogging may not be planted until the spring.

Spring planting should also be seri-



ously considered in areas prone to very severe frosts in winter.

Ordering seedlings

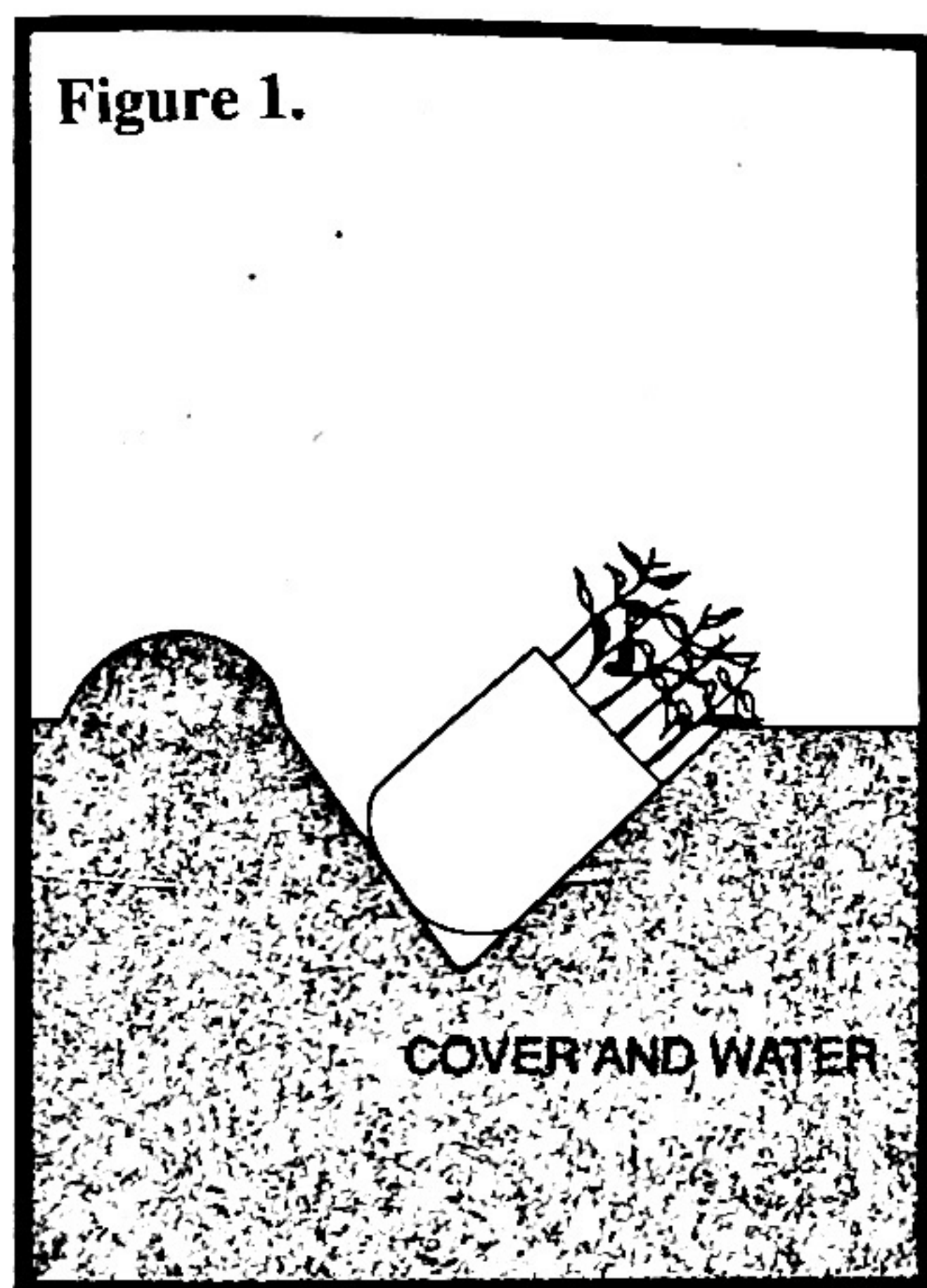
Nurseries are under increasing pressure to supply seedlings so to avoid disappointment and delays orders should be placed well in advance.

Ordering six to nine months ahead will ensure you have the plants when you really need them and the nursery can plan their activities.

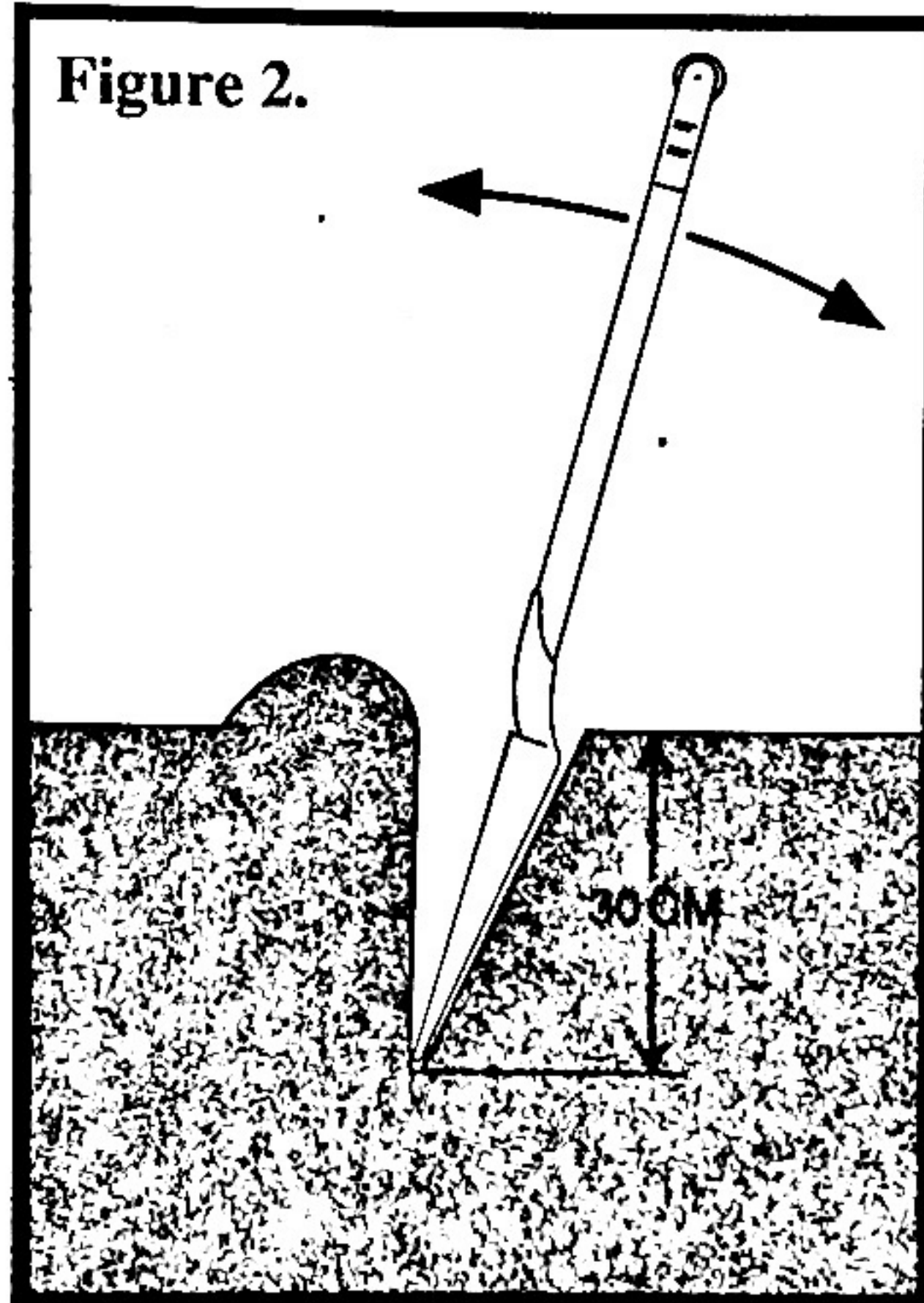
A rewarding and cheaper alternative is to propagate your own seedlings.

Open-rooted seedlings are lifted by machine from their nursery bed without soil around their roots.

For this reason careful handling of these

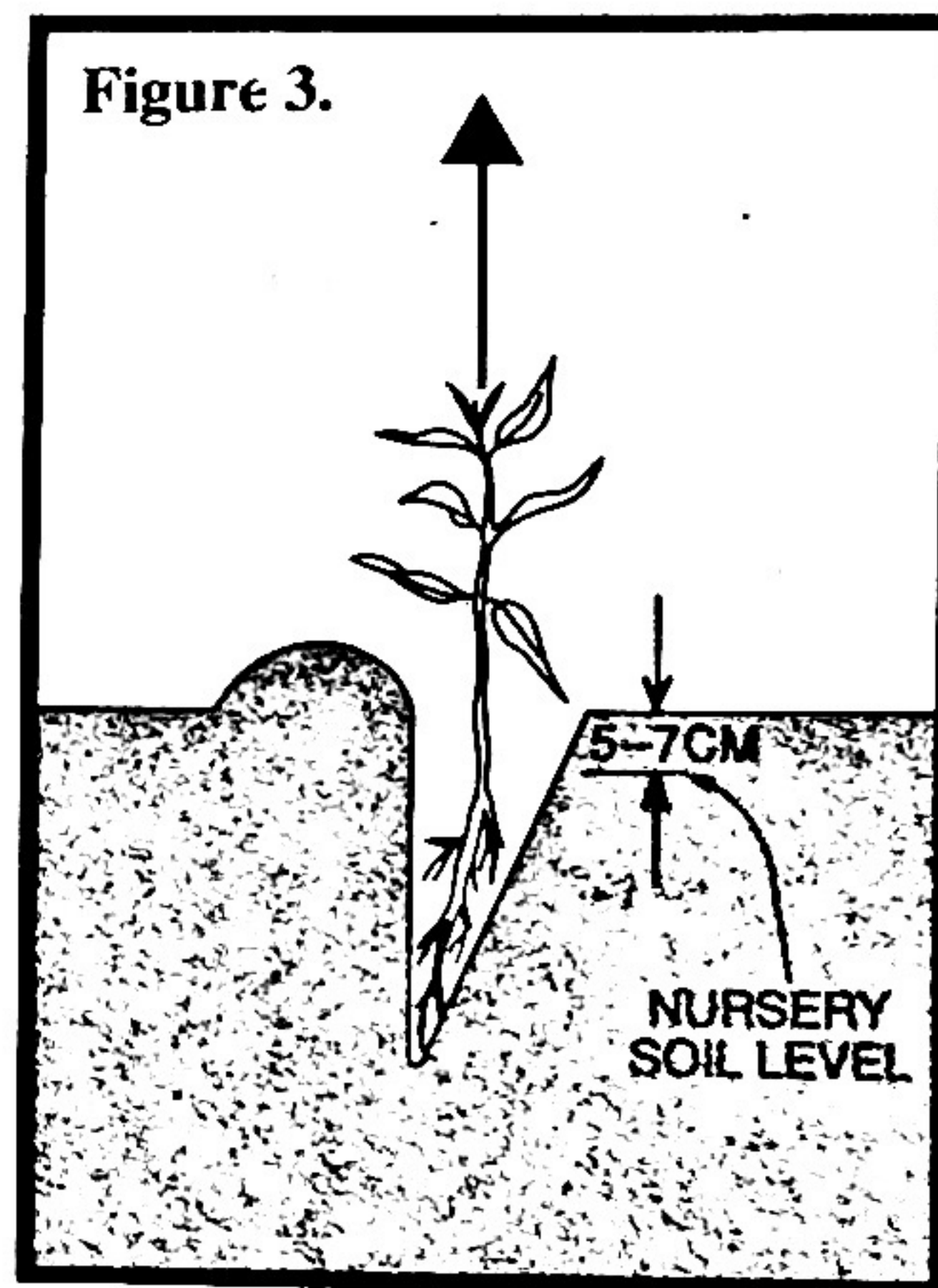


For temporary storage of open-root seedlings, cover the roots of the plants with a moist bag or hessian. Put them into a trench, cover with soil and water the roots. Do not allow the roots to be exposed to the air any longer than necessary.



Prepare a hole approximately 30cm deep using a spade or a wedge-shaped tool.

*Charts, such as the example below, are not available for all states, but this NSW model serves as a good style to follow.



Hold the plant between 5 and 7cm above the nursery soil level and insert it into the hole.

Tree planting times for New South Wales

Month	Coastal districts		Tablelands and SW slopes and plains		W. slopes and plains	Riverina
	Tubes	Open Rooted	Tubes	Open Rooted	Tubes	Tubes
January	Native species & all sp.-in frost-free areas	Pines	Deciduous species Frost-hardy sp. Native species	Pines	Deciduous species	Deciduous species Native sp. eucalypts
February						
March						
April						
May						
June						
July						
August-September	Native species only.				Native sp. & eucalypts	
October						
November						
December						

SITE PREPARATION

plants is critical as the roots can quickly dry out and the seedlings will die.

Seedling handling procedures are the same for all species. When the plants are lifted at the nursery they are immediately packed in wet bags and watered.

The first opportunity for the seedlings to dry out occurs when they are despatched and transported, especially if they are transported on the back of an open vehicle.

If possible trees should be transported in covered vehicles or covered with plastic to minimise the wind factor.

These seedlings should be planted out as soon as possible but obviously with large planting programmes some plants must be held.

Figure 1 illustrates a suitable method of temporary storage known as 'heeling in'.

Planting techniques

Planting techniques include hand plant-

ing bare-rooted or potted seedlings using a proprietary planting tool like the Hamilton Treeplanter or the Hiko Potting system.

Both bare-rooted and potted seedlings can also be machine planted using, for

example, the Nufab Treeplanter or the Agro Revegetation transplanter.

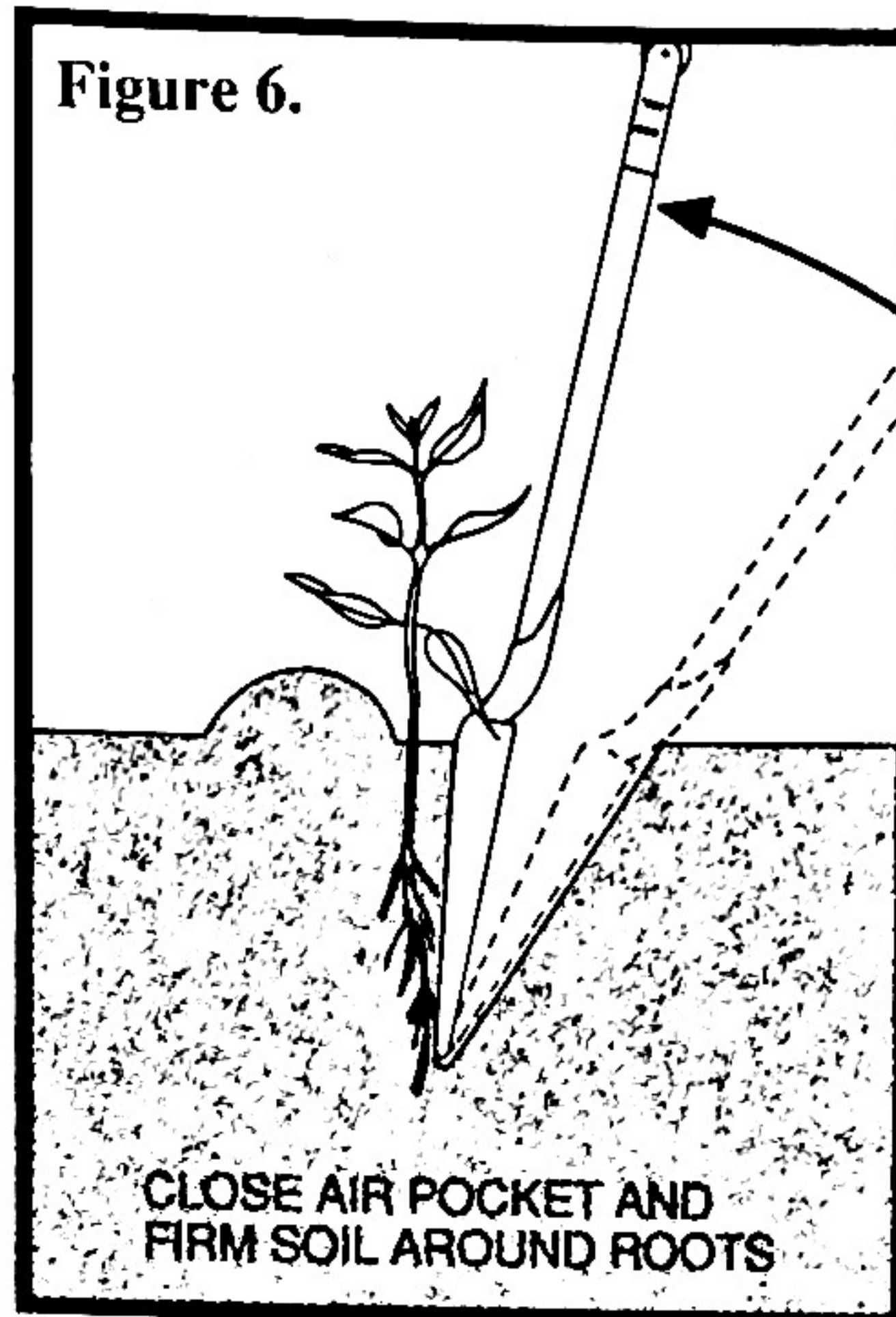
Figures 2 to 12 illustrate the methods for planting out open-rooted and potted seedlings.

Check list

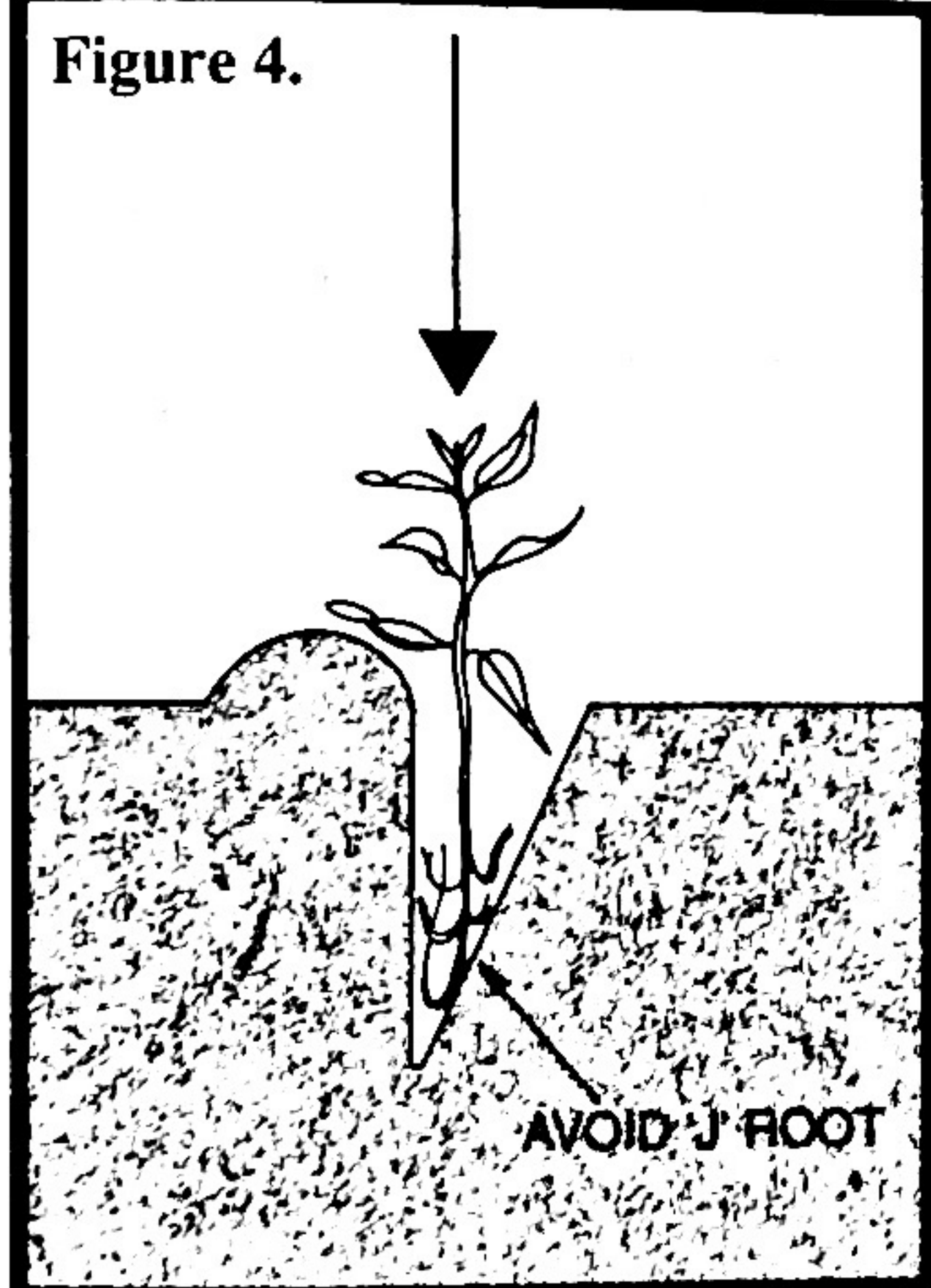
A successful tree or shrub planting programme will depend on how closely the following points are followed:

- Proper soil preparation and weed control.
- Removal of non-wetting soil to one side.
- Seedlings must be planted into moist soil.
- Tree roots should be pointed down with no 'J curves'.
- The press wheels on mechanical planters must work.
- Plant five to seven centimetres deeper than the nursery level.
- Never allow the roots to dry out.
- Excessive tap roots should be pruned.

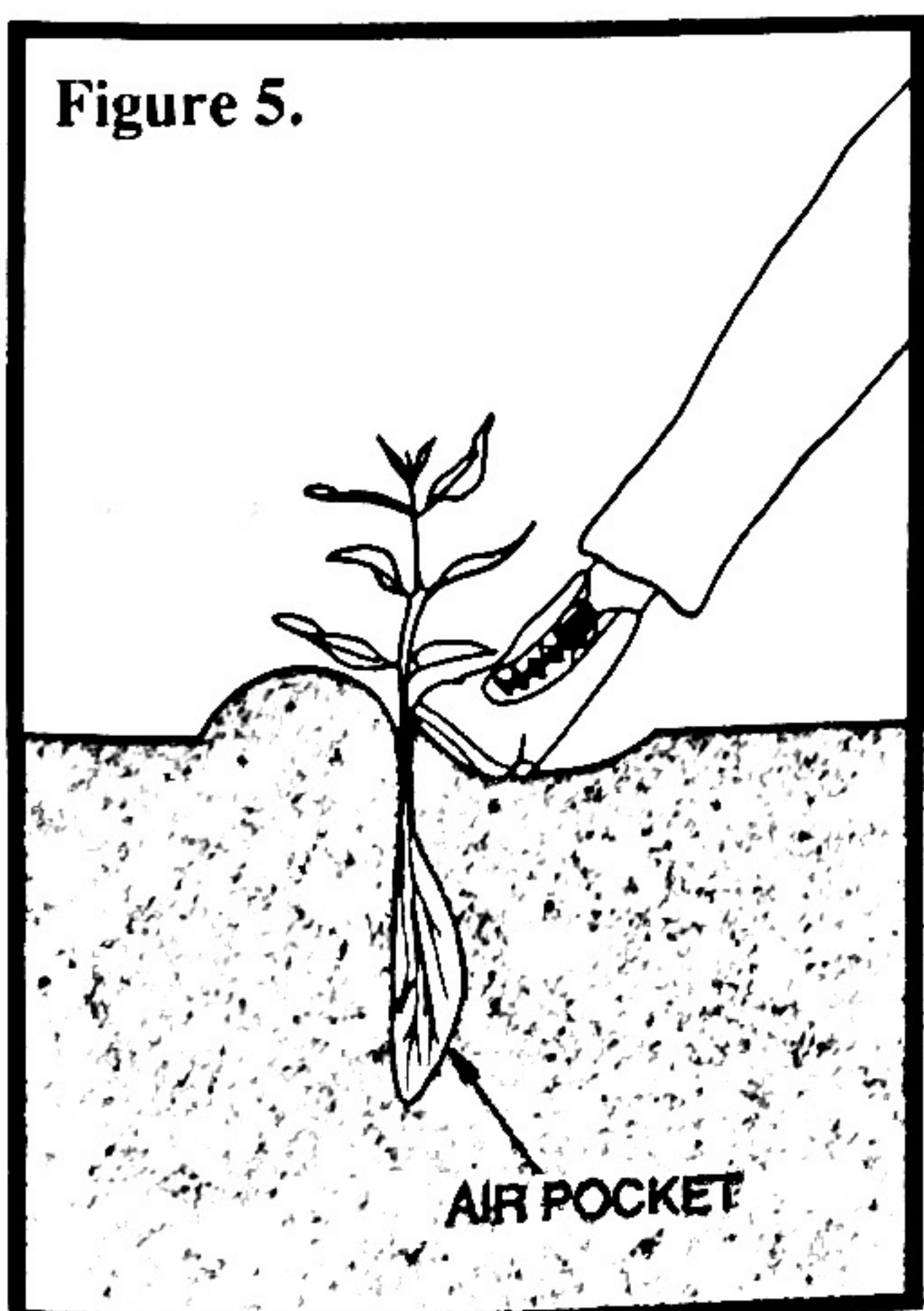
Acknowledgements: Chart is courtesy of the WA Department of Conservation and Land Management, Figures by permission of Monsanto.



Re-insert the spade 10-15cm from the stem and, with a levering action, press the soil against the roots ensuring the tree remains upright. If the tap root is longer than the hole cut off the excess. Press soil around the tree with your foot and create a saucer-like depression to trap water.



Gently raise the plant so that the roots are orientated downwards and your fingers are level with the surface of the soil.



With your heel press some soil against the stem to hold it in position.

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