

Planting Native Trees and Shrubs

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Ground Preparation – consider the scale of the planting, the situation and the soil type.

Ripping – the aim of ripping is to fracture hard-set soils and any impeding layer obstructing root penetration. For small sites, consider using a crow-bar to break up the ground at the planting spots before you plant the seedling. There is little point in ripping deep sands, nor in ripping wide-cracking clay sites which may crack along the rip lines in summer, exposing the roots. For suitable soils and large-scale planting, rip the planting lines to a depth of at least 45 cm (1 m with a bulldozer) in autumn to fracture the subsoil when dry. Roll each side of the line with a vehicle to firm the top.

Cultivation – cultivation for weed control is expensive and may allow other weeds to invade. It may also result in wind-throw during wet periods in the next year. However, mould-boarding can give effective weed control by burying weed seed.

Mounding – mounds improve survival and early growth on most sites except dry sites. Where offset discs are not available a 3-furrow plough can be used to form mounds on wet or saline areas. After working in one direction go back along the line from the other side to form the mound. Mound in autumn or early winter to avoid bogging the machinery and to let the soil consolidate before planting.

Weed Control – poor weed control accounts for most tree-planting failures. Weeds may reduce early growth rates to as little as 30% of weed-free trees and decrease survival from an expected 95% to as little as 10%.

Before planting – eliminate weeds in early spring before they use up stored water. For best results apply a knockdown herbicide (e.g. 2 L/ha of *glyphosate*) in mid August when the pasture is growing, preferably after hard grazing, with a further application (just prior to planting) of a knockdown herbicide (e.g. 2-4 L/ha of *glyphosate*) plus a residual chemical (e.g. 6 L/ha of *simazine* or 10-30 g/ha of *chlorsulfuron*). Be careful with high rates of the triazines, because leaching can occur on sandy soil. Use a wetting agent (0.5 ml/L) and ammonium sulphate (25 g/L of spray, or a commercial product such as "Boost" @ 20 ml/L of spray solution) to overcome deactivation of *glyphosate* by the triazines. A good chemical for very sandy soil is *chlorsulfuron* [e.g. Glean, 25 g/ha]. Apply in spots 1.5-2 m diameter or 1.5 m wide strips.

After planting – residual chemicals (e.g. *simazine* or *oxyflourfen*) should be applied as an overspray or as a directed or shielded spray in the autumn, before much weed germination occurs. Grass can be controlled by over-spraying the trees with *fluazifop-p* (4 L/ha), or by using a shielded or directed spray of *glyphosate* (2 L/ha). *Oxyflourfen* or *glyphosate* will also control broad-leaved weeds (e.g. capeweed) which can smother slow-growing trees. An overspray of 1.5 L/ha of *haloxyfop* plus 1.5 L/ha *clopyralid* (for eucalypts or pine only) will also control grass and broadleaved weeds. The area within 1 m radius of the tree must be kept free of grass (capeweed and clover is of less concern and it may give a good summer mulch) for the first 2-3 years to maximise survival and growth.

Planting – planting in early spring allows good prior weed control, avoids most frosts, cold or waterlogged soil, and losses of seedlings to birds building nests. Plant earlier only on dry sites. Plant within 5 cm of the rip line, except where water is lying, in which case plant higher off the ripline. There is usually no benefit from adding slow-release fertiliser.

On sticky clay, or hard un-ripped sites, use a crowbar to break up the soil and make a hole for the plant.

On all other sites a core of soil the same shape but at least 2 cm deeper than the seedling pot is removed at the planting site using the Hamilton Treeplanter. The seedling is tapped from the pot, slipped into the hole, some soil is pushed from the top edges of the hole over the top surface of the planted core and the plant is firmed in gently with finger pressure only.

Covering of the surface of the seedling core with soil is needed because most nurseries use a very light, friable potting mix that dries out very quickly and, if hot weather follows the planting, the seedling may die before its roots can expand beyond the core.

Planting with the Hamilton tree-planter allows roots to be placed beneath any surface layer of residual herbicide. Two people can plant 500-800 seedlings/day. Experience in using this approach in planting over 200,000 trees from about 100 species, on soils ranging from sand to heavy clay in SW Victoria, has shown an overall loss from all causes in the first year was only 10%. A similar result was obtained on the Potter Farmland project where over 150,000 trees were planted

For pines or rooted cuttings, trim long roots, make a deep hole, suspend the plant in the hole while soil is loosely filled back around the roots, then pull the tree up 5-10 cm before firming, to straighten any bent roots. Firm in by gently treading each side of the plant (do not stomp).

Mulching – this is not essential but it may be effective in suppressing weed growth around the tree. If used it should not be too thick (it may reduce the effectiveness of any rain) and should not be placed tight against the plant. Weed-mat, plant material, wood chips, gravel, old newspapers etc. may be effective. Mulch may add to any frost problem since the mulch will reduce heat radiation from the soil.

Watering – no water is used at planting if the soil is moist, but soak the seedlings in their pots before planting. If the soil is a little dry, fill the planting core hole with water, allow to drain, then plant. For replacements made in late spring-early summer, 10-15 L is given at planting. Replacements should not be made in the autumn if the site is poorly drained or if the species is frost-prone.

Where annual rainfall exceeds 450 mm no other watering should be needed, or given, if the site has been ripped, if weed control is good, the appropriate species have been planted at the right time and there is little competition from established trees nearby. If 2 or more of those conditions are negative then watering will probably be needed.

Protection – insect pests and browsing mammals may need to be controlled

Insect pests – severe infestations of sawfly larvae, autumn gum-moth caterpillar or skeletonizers should be controlled by manual removal or spraying with 0.1% *maldison* (1 g of active ingredient/L of spray), *dimethoate* (systemic insecticide; use 3 mL of a 400 g a.i./L concentrate to make 1 L of spray). Add *wetting agent* (0.1% of spray) and *white oil* (3% of spray) to control scale insects. Wingless grasshoppers can be controlled by spraying the area with 100 mL of a 500 g/L *maldison* concentrate mixed in 100 L of water (check after 1 week), or baited with 1 kg of bran sprayed with 25 mL of the concentrate. The chemical is effective for only a few days once exposed to sunlight.

Some species planted outside their normal range are insect-prone and should be avoided. Others, including *E. globulus*, are tolerant of occasional defoliation which may reduce wind-throw in early spring. Include the local *Acacias*, *Banksias*, *Bursaria* to aid long-term control of insects by birds, wasps and mammals such as sugar gliders.

Mammal browsing and bird damage– Tree guards are often necessary. Some genera (*e.g. Allocasuarina* and *Banksia*) are very attractive to Black Wallaby, hares and rabbits. Wallabies will continue their attack for years, stunting or eventually killing the plant. In some areas, cockatoos/corellas will pull out unguarded seedlings within hours of planting. Tree guards include old tyres and tubes, 200 L drums, steel mesh, soft or rigid plastic sleeves, milk cartons and electrified wire hoops. The fine mesh plastic guards are cheap but not as effective as the plastic sheet.

Where livestock have access the trees must be protected for at least 3 years. For protection from sheep, electrified guards, old drums, or cylinders of galvanised mesh may be used. One effective guard is a 1.2 m high x 40 cm diameter cylinder of 2.5 mm thick steel mesh (75 mm x 50 mm) pegged down. This is unclipped and used elsewhere when the trunk no longer requires protection. These cost perhaps \$8-10 each. For cattle, mesh of 100 mm x 100 mm (200 mm x 200 mm if no sheep are present) and diameter 1.5 m is needed. For wallabies, use a guard 60-90 cm high, diameter 40 cm and mesh 50 mm x 50 mm.

Frost – damage from frost may be reduced using plastic sheet guards and by not mulching but keeping the soil around the tree bare. On frost-prone sites consider more frost-tolerant species or plant later in spring in the hope of avoiding a bad frost.