

Fact sheet 1 Planting and establishment processes

'Planting trees is easy; having a high survival rate is something else altogether'

Site preparation (prior to planting)

- 1 Fence out stock;
- 2 If unknown, test soil pH in several locations
e.g. in revegetation area and adjacent areas of remnant vegetation;
- 3 Spray out weeds to reduce competition during the critical establishment phase – in situ dead weeds protect the soil surface and contribute to soil organic matter and the litter (mulch) layer.

NB. pH measures soil acidity or alkalinity from a range of 0-14. 0 to 6.5 is in the acidic range; 7 is neutral and 7.5-14 is alkaline.

Most plants in south-eastern Queensland prefer mild to strongly acid soils in the range of 5.5 to 6.5. Commonly used soil additives to address pH imbalances include acid, lime, or dolomite.

Pre-planting

- 1 Spray tubestock with Envy™ 24 hours prior to planting (refer to following NB);
- 2 Pre-soak tubestock to facilitate extraction from the tube and to reduce transplant shock (do not wash Envy™ off); add Seasol or similar product if desired;
- 3 Wait for good rain (50 mm) before planting or pre-water the planting hole when conditions are dry.

NB. Envy™ must be applied a minimum of 24 hours prior to planting, or it will not be effective. Make sure spray units or knapsacks are triple rinsed prior to using Envy™ to remove any harmful residue.



Use a tub or bucket of water to pre-soak tubestock prior to planting out

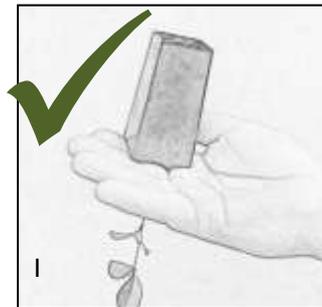
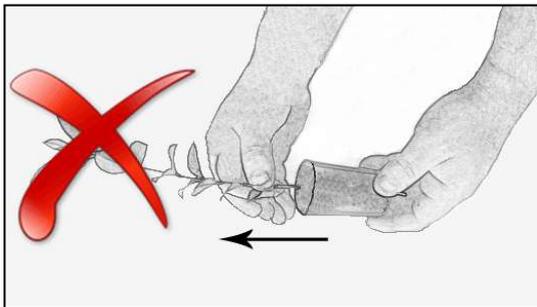


Use a barrow or cart for racks or number of tubes - useful in the field

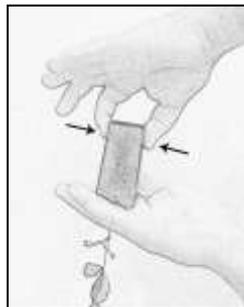
Maintain water level to near top of tubes; leave soaking until completely saturated (when bubbling stops)

Planting out

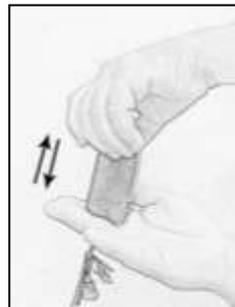
- 1 Dig individual planting holes; depending on soil type, these may need to be several times as wide and deep as the tube – the harder the soil, the bigger the hole required;
- 2 To check the suitability of the depth of the hole, ensure the top of the rootball is at the same level as it was in the tube;
- 3 If required, add soil conditioner to the planting holes, e.g. natramin, gypsum, lime, dolomite (see explanatory notes at end of fact sheet);
- 4 Add fertiliser pellets (refer to NB) to the bottom of the planting holes, cover lightly with soil, before placing tubestock;
- 5 When extracting plants from their tube, do not try to pull them out by their stems; follow the procedure illustrated below in steps 1-5;



II



III



IV



V

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- I. Turn the tube upside down, spread the fingers of one hand around the potting media and stem of the plant;
- II. Tap firmly on the base of the container and gently shake the plant out of the tube;
- III. Squeeze gently around the base or sides of the tube to loosen;
- IV. Slide the tube from the rootball;
- V. If necessary, tap the rim of the pot against something solid to loosen

- 6 Place tubestock in centre of the hole – do not bury the stem any deeper than the level of the original potting media, but ensure growing media is covered;
- 7 Hold plant upright and backfill with soil to approximately half the depth of the planting hole, firm soil gently with fingertips, complete filling, firm once again when complete;
- 8 Finish planting hole as large, saucer-shaped depressions approximately 5 cm below surrounding soil surface to catch rainfall and run-off (therefore the top of the rootball should also be 5 cm below the surrounding soil surface);
- 9 Add or extract soil until the depth of the planting hole is suitable and the walls of the well are sufficient to hold water;
- 10 Mulch the planting well to a depth of 10 cm (4"), but keep mulch clear of plant stems (15 cm) as this can cause collar rot and other infectious diseases;
- 11 Use a watering can to water the plant thoroughly, and to wash soil into air pockets around the rootball – use a minimum of 10 litres of water;
- 12 In most areas wildlife (kangaroos, wallabies, hares, rabbits) pose a serious threat to newly planted tubestock, therefore 1.2 m x 25 mm x 25 mm hardwood stakes and heavy duty long tree guards (such as those available from Suregro) should be used;
- 13 Hammer in a single hardwood stake on the edge of the planting hole, slip the 1.2 m long tree guard over the first stake, place second and third stakes inside guard and tighten guard by hand before hammering in remaining stakes; if guards are not tight, realign stakes;
- 14 Lift tree guards 5 cm above the soil surface to allow free air circulation and prevent plants being 'cooked' during hot periods;
- 15 If advanced specimens from pots or bags are used, greater after-care is required and the establishment period is longer than that for tubestock.

NB. Use of buckets to water plants is unsatisfactory and unsuccessful. Too much water runs away from the planting hole – every litre delivered is critical; any shortfall will reduce the young tubestock's resilience by several days. If watering weekly, tubestock will not survive for 7 days if the full allocation of 10 litres has not been delivered to the root zone.

If plants sink after watering, soil was not firmed adequately during backfilling. Take care not to over firm as this may form an impenetrable crust on the soil surface. Soil firming and watering-in of tubestock is critical as this process removes air pockets from around the rootball. Exposure to air burns off root tips and reduces new growth, significantly.

Use Organic Xtra™- organic fertilisers do not contribute to soil salinisation and/or acidification and they add organic matter (humus) to soils. *Organic Xtra™ is preferred because it never burns or damages plants.* Other more poultry-based organic fertilisers will burn, and are too risky to use in the prescribed manner.

Slow release, non-organic granulated fertiliser is not recommended as it tends to 'let go' during periods of hot weather and/or high humidity.

4" (10 cm) of fresh mulch will quickly settle to 2" (5 cm) in depth; the scientifically proven depth at which mulch buffers climatic conditions (Singer and Martin, 2008). Neither grass cover nor inorganic mulches are as effective at buffering.

Grassy hay, mouldy lucerne, or sugar cane mulch are the best mulches as they tend to require smaller amounts of nitrogen to break down than wood chip or pine bark. Generally, they are cheaper too, but weed hygiene is an issue associated with grassy hay and lucerne. The vendor should always provide a weed hygiene declaration form at the point of sale, prior to delivery. Please go to <http://www.daff.qld.gov.au/plants/weeds-pest-animals-ants/weeds/preventing-weed-spread/legal-requirements/weed-hygiene-declaration> for further information.

Planting trees is an expensive exercise, so the utmost care should be taken during all steps of the planting and establishment process to facilitate the success rates of your revegetation project. A minimum economic survival rate sits around 85% - if this is not guaranteed then the exercise has failed in its landscape outcomes and cost effectiveness.

Post planting care

- 1 Unless there are significant falls of rain (more than one fall of 50 mm or more) within 1 month of planting, all stocks will require watering at a minimum of 10 litres each per week for approximately 6 weeks;
- 2 After the initial 6 weeks, watering intervals can be reduced to fortnightly;
- 3 After 3 months (in total of 1 & 2 above), if conditions remain dry continue watering as required;
- 4 Watering is essential to protect the investment in plant stocks;
- 5 To water large numbers of tubestock at any one time in the same place use numerous watering cans and helpers;
- 6 Occasionally young tubestock may be 'leggy' with a weak, thin stem, in which case they may require staking (this is rare);
- 7 If staking is required, *do not* tie the stem securely to stakes – it is important to leave the stem loose, as freedom to move around in the wind strengthens weak stems;
- 8 There are several options for staking but the easiest and simplest method is to use a single stake and tie the restraining material (rope, plastic strapping or light rubber hose) in a loose figure 8, encircling the stem and secured to the stake;
- 9 Another common requirement of leggy young plant stocks is pruning; do not prune trees unless it is to remove lower limbs only;
- 10 If young shrubs are leggy and require pruning, it is better to prune them quite hard to assist with development of their future shape and density;
- 11 Pests such as hares and rabbits will nip off young plants – to protect them from pests and wandering pets use tree guards until plants are established and well –developed (1-2 years);

- 12 It is recommended that 1 m plastic sleeves be used as these will also reduce frost damage to seedlings that are sensitive when young – these should be raised approximately 5 cm from the ground surface to allow air circulation and prevent young plant stocks from ‘cooking’ during periods of warm to hot weather;
 - 13 As soon as the weather cools, pull the sleeves down to ground level or cold air will ring-bark the young plants;
 - 14 Monitor plantings regularly until they are established during the weekly watering – the establishment period will be determined by prevailing weather conditions and the success of the plantings, but may be expected to take at least 6 months or until there is an extended wet period during which the soil profile becomes saturated to 1 metre deep;
 - 15 If losses of tubestock exceed 15-20% (depending upon original densities), replanting will be required;
 - 16 Remove sleeves when plants emerge above the top, but treat weeds beforehand
- NB.** Do not fail to remove the sleeves in a timely manner and fold and store for future re-use.

Pests and diseases

- 1 Almost all plants are susceptible to pests and diseases;
- 2 By selecting as many locally occurring native species as possible pest and disease outbreaks will be kept to a minimum;
- 3 It is recommended that chemicals not be used to control outbreaks – allow natural predators - birds, reptiles, mammals and insects to control pest species;
- 4 Occasionally severe outbreaks will occur but if not interfered with, a natural balance between pests and predators will be restored naturally.

Explanatory notes

Use **natramin** and **gypsum** to improve soil structure. Characteristics of poor soil structure include:

- 1 Slipperiness and stickiness when wet;
- 2 Slumping (dissolving of clods) and muddiness during rain;
- 3 Surface crusting when dry;
- 4 Slow entry of water/water impermeable;
- 5 Not breaking down into small clods during digging - is not loose and well-aerated (does not possess good tilth);
- 6 A lack of humus and/or organic matter.

Acid, lime or dolomite is used to adjust soil pH levels, when soils are strongly acid or alkaline, which can have a strongly detrimental effect on plant growth. Most plants grow best in the pH range of 5.5 – 6.5. Given the good structure and rich nature of the alluvials around the North Burnett, it is recommended that soil conditioners be added to rip lines (or planting holes) prior to planting to improve soil pH and structure.

Genetic provenance

Genetic provenance is a term, which is not part of general common-use language. It is however, an extremely important phrase when discussing plants and horticulture, as it often determines the success or failure of highly desirable species in a given location.

Many plants grow in a range of climatic situations from warm, humid coastal areas to very frosty, dry inland districts. Measured results from extended testing and trialling are the basis of the suitability information found on plant labels and in books, which allows would-be purchasers to assume expectations on how an individual species may perform in cultivation. This information is however a generalisation, as the genetic provenance of any particular seed or plant stock may prove an exception to the general rule.

For example if plants you purchase have a warm coastal provenance, they are highly unlikely to withstand frost and dry conditions, even though members of this species from every other known location have an in-built genetic capacity to do so. Therefore, it is always possible that a recommended species will fail in a specific location when otherwise it would be expected to thrive. Unfortunately, information on genetic provenance is virtually impossible to obtain from commercial outlets, so some failures are always a possibility.

Broadcasting seed

In consideration of the volume of areas to be sown by seed, it will be just as quick and easy (and reliable) to broadcast the seed by hand.

Prior to broadcasting seed mixes, calculate how much seed is required for 25m², if this is too insignificant to weigh (depends on quality and precision of scales), calculate the weight required for 100m² and divide this amount of seed into 4 amounts.

Peg out an area of 25m² and broadcast the relative amount of seed – it does not take long to get a fair understanding of distribution rates of seed for revegetation sites.

Remember that seeding rates for revegetation sites are much reduced than those recommended for broodmare pasture or lawns, so the sowing rates are equally much reduced. It is highly unlikely that a commercial seed spreader would be reliable across the smaller areas considered in these guidelines and reduced ratios required for revegetation purposes, hence the preference to broadcast seed mixes by hand.

Sometimes, it is simply quicker and easier to do things manually.