

Central Queensland guide for planted agroforestry



Plantation/agro forestry provides an opportunity to integrate trees into other production systems on farm, for the range of benefits that they provide, such as shade and timber. Many landscapes and farming systems could benefit from more trees.

Plantation forestry provides the avenue for tree establishment, via the use of proven and successful techniques. These trees then benefit the farm through not only the growth of timber but the provision of the shade, shelter and where placed correctly act as a wind break and can lower water tables.

Agroforestry has been successfully implemented on many farms in central Queensland. Agroforestry is most commonly a dual purpose enterprise; aimed at producing timber, or other tree products, while gaining the benefits of trees, such as shade lines. Agroforestry designs in central Queensland include:

- Timber Production
- Salinity control
- Habitat creation
- Wind breaks
- Shade lines
- Investment
- Vegetative buffers

Selecting a species that will prosper is the first key to success in establishing trees and agro forestry. Not all trees will be suitable for your farm. Some trees, while highly productive and valuable may not be suited to your area as they may have known pests and diseases, or may require a moister climate and different soils.

Prepared by Ross Miller, 2007



Silvicultural management of planted agroforests

Silviculture is the science of cultivating trees. Silvicultural management describes the various regimes that will be used to grow the trees from bare ground to tall timber. Silvicultural management in a planted forest involves; site preparation, grazing, planting, fertilising, weed control, thinning, pruning and harvesting. These practices are explained below.

Site preparation

This involves getting the site ready to grow trees. The site needs to be deep ripped and cultivated along the rows in which the trees will be planted (usually 3-5 m apart), and kept weed free for at least 2 months before planting trees. This will allow moisture to store in the soil and enable the trees to establish quickly.

Fire breaks must be established and maintained around a plantation for the duration of its life, but especially after thinning and pruning when extra fuel will be present.

Grazing

Cattle grazing can be an important form of weed control in plantations. It is however important to exclude cattle from the plantation for the first two years to enable the trees to grow large enough to cope with cattle rubbing and pushing on them.

It is usually necessary to fence, if only temporarily the plantation site.

Planting

The tree species need to be suitably matched to the site, to allow the trees to prosper; otherwise they are likely to fail. The trees should be planted at the selected spacing (usually 4 m rows x 2.5-3 m along rows) after rain or when the soil moisture is adequate. Some watering in is required if it is dry.

Fertilising

Most trees respond positively to fertilising with nitrogen and phosphorous. An NPK fertiliser should be applied to the trees shortly after planting, to boost initial vigour. The pellets should be applied 30 cm away from the base of the seedling to avoid the roots being 'burnt'. Additional fertilising after thinning can also be helpful.

Weed control

Once the trees are in the ground, the key to success is weed control. Trees are poor competitors, compared to grasses. When the weeds (grasses, etc) are controlled the trees will grow well. Without weed control the trees will struggle and do poorly. Weed control, along the plant rows is essential for the first two years at a minimum.

Thinning

The process of thinning a planted forest enables the best trees to continue rapid growth and reach maturity. Thinning is usually done in two instalments through the life of the plantation, once early at age 3, and again later at age 10-14 years, to reach the final desired stocking (usually around the 200 trees/ha).

Pruning

Pruning is done to potentially add value to the final crop trees, by reducing the incidence of knots in the wood. At present clear wood of some species has a market advantage as it can be used for 'select' grade timber. There are some examples where pruned wood has achieved a market premium and others where it has not.

Pruning is done firstly in conjunction with the first thin, up to a height that can be pruned from the ground. At this stage trees can also be 'form pruned' to leave one dominant growing tip. A second thin is then done to about 6 m up the stem, when the trees are approximately 12 m or higher.

Ensure when pruning to cut the branch close to the trunk without cutting the branch collar and to retain two thirds of the canopy at all times.

Harvesting

While harvesting is well down the track in a young plantation, consideration must be given to access and log landing/loading areas. Harvesting should occur when the trees are large enough to fit the product dimensions.





Species selection

Matching species to site is extremely important when planting trees. While some trees will prosper in areas and soils unlike their natural habitat, others will fail.

The best way to find out which species are suitable is to learn from others and have a look at trials in your local area, on similar sites such as soils, climate and drainage. There are many factors when considering species selection for your plantation. These are:

- Objectives of growing trees
- Soils
- Climate
- Pests & disease
- Plantation design & size
- Infrastructure
- Lay of the land
- Species that have already proven successful in your local area.

Some species that are showing signs of performing successfully in central Queensland are shown in Table 1. Note there may be many more than those shown here.

Table 1. Tree species with potential for plantation forestry in central Queensland

Species	Currently widely used for solid timber products	Suitable timber qualities for solid wood products
Eucalyptus argophloia (western white gum)		✓
Corymbia citriodora (lemon scented spotted gum)	✓	✓
Corymbia variegata (spotted gum)	✓	✓
E moluccana (grey box)	✓	✓
E cambageana (Dawson river blackbutt)		✓
E thozetiana (Thozet's box)		✓

Problems

Pests and disease

Most agricultural crops are subject to a range of pests and diseases that periodically affect the plant and cause yield reductions or crop failure. The best approach is to research potential plantation species and identify possible pest and disease problems, then choose a variety/ species that has good pest and disease resistance to avoid costly treatments.

Deficiencies

Usually linked to the soil, these can be either nutrient, or water deficiencies. Trees like all crops have nutrient and water requirements, if these are not met the growth of the trees will be retarded, or they will decline and die, depending on the severity. Soil tests prior to establishment can help to identify potential soil deficiencies. Monitoring leaves, and where required foliar analysis will also help to identify problems as they arise.

