

6.2 Replacement

When camphor laurel is replaced by competitive pasture or native vegetation you are providing a **long-term weed control**. Planting alternate food sources for birds that currently eat and spread camphor laurels will **reduce the spread** of camphor laurels.

6.2.1 Establishing pasture

Where camphor laurel is controlled in order to improve pasture, the planting of competitive pasture grasses is generally required. Successful establishment of pasture grasses, orchards or other horticultural activities following camphor laurel control requires appropriate site preparation. Camphor laurels can change the soil characteristics, particularly soil pH and chemistry, and therefore it is important to have the soil tested before commencing horticultural activities.

At the end of the Kit is a list of pasture species suitable for your area and important information about preparation, sowing and maintenance.

Land managers in the Hastings and Macleay areas should refer to pasture guides for areas both to the north and south until guides for that area are available. For further information contact your local Department of Agriculture (District Agronomists contact details are listed in chapter 12.1).

6.2.2 What trees grow where?

Whether you're planting a shade tree in a paddock or a forest, there are a number of important factors to consider before choosing what species to plant and where:

Site location – large-scale

Soils and climatic conditions vary considerably throughout the region. For best results, choose species that naturally grow in your part of the catchment, and where possible, grown from seed sourced in the nearby area. Look in paddocks, bushland remnants and roadsides to see what native species grow best in each situation. These species have more chance of surviving, generally require less maintenance, are unlikely to become weedy and provide other benefits such as habitat for native flora and fauna.

Site location - local area

Even at a property-scale there can be substantial variations in temperature, soil moisture, fertility, wind and number and severity of frosts. It is important to note the site characteristics from area-to-area. Consider the following points (from Read 1987):

Topography and aspect Deeper soils are generally found in **low-lying areas** or local depressions where sediments accumulate. Where drainage is good and rainfall is high (above 1200mm), these areas will often support rainforest or moist eucalypt forest species. **Exposed** locations require initial planting of hardy pioneer species and / or windbreaks. In southern and elevated locations low-lying areas are also prone to more frost (at night cool air flows downhill and gathers in depressions just like water). Where drainage is poor, low-lying areas tend to favour wetland and swamp forest species.

Vegetation on **slopes** is largely affected by aspect (as well as elevation, soils etc.). South-east facing slopes are generally cool and moist, and in high rainfall areas will often support rainforest species. North-west facing slopes are generally warmer and drier, and often support eucalypt species and non-rainforest understorey species. The aspect and quality / depth of soil will vary considerably with small-scale changes in topography.

Ridge tops generally have shallow soils and hence require the planting of more hardy species suited to those exposed and drier sites.

Soils have a major influence on the types of plants and the associations of those plants found in an area. As soils vary considerably from area to area it is important to have your soil tested before deciding what to plant in which location.

Soils can vary due to their different structures, textures, moisture retaining abilities, colours and degrees of acidity or alkalinity (Read 1987). Soil characteristics vary with depth. As you would expect, shrubs and ground covers are generally more influenced by the soil's upper levels, where trees are also influenced by the lower soil levels.

Soil colour indicates how well the soil drains, the presence or absence of iron oxides (as iron oxide becomes mobile in saturated soils), the amount of organic matter within the soil and the amount of leaching (i.e removal of minerals in the soil by water) that occurs in the upper layers. The presence of yellows, browns or reds generally indicates well drained soil (and / or the presence of iron oxides). Poorly drained soils are grey to black. Organic matter (such as decaying mulch, leaves, bark etc.) darkens the soil's upper levels while leaching produces pale upper levels.

Nutrients are vital to plant growth, however, most Australian soils are naturally low in nutrients. When nutrient levels are dramatically increased, such as where urban or dairy runoff is concentrated, conditions favour the establishment of many weed species. Soils can be depleted of nutrients through erosion.

Structure and texture will affect the soil's water holding capacity. Heavy clay soils tend to be poorly drained, and are reluctant to release soil moisture and nutrients. Sandy soils, on the other hand, are well drained and aerated, often to such an extent that they retain little moisture and nutrients. Clay soils often support more grassy understoreys whilst sandy soils support more heathy and shrubby plants (Read 1987). When organic matter is present, it acts as a sponge and can release water to plants (Buchanan 1989).

pH is a measure of soil acidity or alkalinity, indicated by a scale from 1 (very acid) to 14 (very alkaline). The pH impacts on the ability of plants to absorb soil nutrients. Most native plants prefer pH levels of 6-7, although wide variations occur from area to area.

Geology – Soils are formed from the surrounding area's geology (rocks). As a rough guide granites, sedimentary rocks and those with large particles generally produce sandy soils while basalts and those with minute particles generally form clayey soils.

Vegetation communities and classification of vegetation

Trees are just one part of a healthy natural ecosystem. Vegetation communities are associations of trees, shrubs and groundcovers (and vines etc.) which are found together in any particular area. Vegetation communities can be classified according to characteristics such as height, tree canopy cover and dominant plant species.

The broad vegetation types, as classified by Webb (1978) and others, most commonly invaded by camphor laurel are:

Subtropical rainforest - Lowland and cool forms. Very diverse. Mostly cleared. Prefers deep, well drained soils and high rainfall and volcanic soils on slopes.

Warm temperate rainforest - Less diverse. Found in gullies and south facing slopes in hilly or mountainous country on poorer soils.

Littoral rainforest - Similar to subtropical rainforest but with Dry Rf. species. Found behind hind dunes in coastal areas. Sandy soils.

Dry rainforest - Diverse canopy but with little understorey. Hoop Pines and Fig emergents. Seasonally dry and/or lower rainfall. Fertile soils.

Wet sclerophyll - Tall hard-leaved trees usually either eucalypts, brush box or turpentine. May have rainforest understorey. Good rainfall on moderately fertile soils.

Dry sclerophyll - 10-30m tall, trees mostly eucalypts. Shrubby, heath or grassy understorey. Undulating to hilly. Moderate fertility & rainfall.

Riparian - Streambank vegetation. Mixture of rainforest, sclerophyll & other species. Usually poorer soils. Moist. May be steep.

6.2.3 Shade trees replacement

Camphor laurels have been widely planted or retained as shade trees. Plant replacement species NOW to give them time to establish before controlling ALL of your camphor laurels if they are your only shade trees. Remember that the longer your camphor shade trees remain, the more camphor seedlings will appear in your area.

Native “strangler” Fig Trees

In agricultural areas that receive few frosts, native fig trees can provide an excellent fast growing replacement of camphor laurels. When “strangler figs” are planted in the forks of branches or stumps above the height of browsing animals they can be a cheap form of replacement due to the fact that fencing around the tree is not usually required.

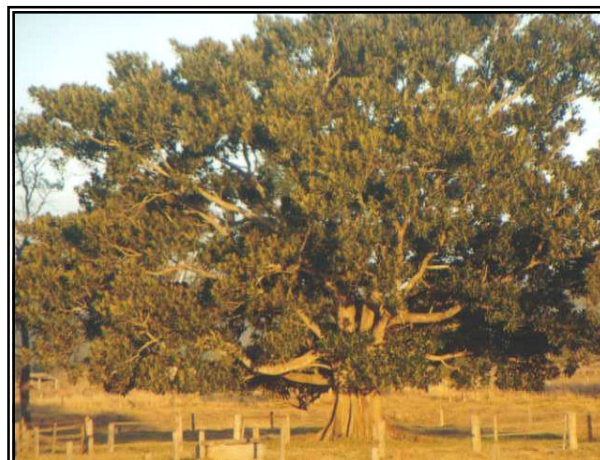


Plate 35: Mature “strangler” fig tree. Source: T.Scanlon.

Which species?

Native strangler fig trees most suitable include Moreton Bay Fig (*Ficus macrophylla*), Small-leaved Fig (*F. obliqua*), Port Jackson Fig (*F. rubiginosa*), Deciduous Fig (*F. superba* var. *henneana*), White Fig (*F. virens* var. *sublanceolata*) and Strangler Fig (*F. watkinsiana*) (Wallace 1981). They can be grown from seed, local cuttings or purchased from nurseries. See the table at the end of chapter for more information.

Not all fig species are strangler figs. Creek Sandpaper Fig (*F. coronata*) and Sandpaper Fig (*F. fraseri*) grow best in the ground.



Where to plant?

Strangler Figs can be planted in the fork of branches where there is a large enough depression to support the seedling and soil (see plate 36); in planter boxes (with some holes to allow roots to penetrate) in trees, or; in the stump of a hollow dead camphor laurel or other trees. When planting in the fork of a tree it is often necessary to remove some branches to increase the light available to the fig. Initial follow-up watering is generally required. Native fig trees can also be planted directly into the ground (however more protection is required from grazing animals etc.) as part of a clump planting with pioneer species such as wattles.

Plate 36: “Strangler” Fig in a camphor laurel. Source: T.Scanlon.

How to encourage growth?

Native fig trees can be fed regularly using slow-release fertiliser (or rotted cow manure when established) and require plenty of water and nutrients (Stace 1994). In ideal conditions, strangler figs can take over their host within 15-20 years (pers. obs.).

Farm forestry

Farm Forestry can provide financial returns, assist in the control of camphor laurels, help repair degraded land and provide habitat benefits if planned properly.

Farm Forestry projects can be established with the assistance of a number of organisations located in the region. NSW State Forests (Grafton 6642 2048) is planning to offer to harvest camphor laurel and replant hardwood plantations and areas of rainforest on private land on the Far North Coast (see chapter 7.2 for more information). Other organisations involved in farm forestry include Greening Australia (6657 2411), Upper Clarence Farm Forestry Network (Terry Moody 6665 3133), Subtropical Farm Forestry Association (Martin Novak 6628 4372), DLWC (Bruce Cole-Clarke 6640 2000) and others (look under "Forestry Services" in the Yellow pages).

The excellent 1999 publication "Australian forest growers" can be obtained from the Australian Forest Growers Executive Officer on 02 6285 3833.

When planning for farm forestry operations a number of points need to be considered:

Site selection: Size (for viability), access (standard of existing roads etc.), fencing (existing or is new fencing required), topography (slope less than 10° is preferred), soils (reasonable depth and drainage preferred), vegetation (preferably already cleared).

Species selection: Preferably species endemic to the local area. Consider current and potential markets, seedling availability etc.

For more information about planting farm trees see the publication "Trees for the NSW North coast", edited by Lines-Kelly and Currey.

A list of good shade trees for your catchment and a brief description of them can be found at the end of the chapter.

6.2.4 Establishing native vegetation / habitats

Encouragement and / or planting local native species can help provide long-term control of camphor laurel as birds currently eating and spreading camphor laurel will instead be eating and spreading the replacement species.

Regeneration

When native plants / seeds are present and weed control is undertaken in a gradual, sensitive and systematic way, natural regeneration can take the place of weeds and therefore, planting may not be necessary (e.g Joseph 1995, 1999).

Planting can be more expensive, interfere with regeneration and compromise the genetic integrity and scientific value of a site (Greening Australia 1999). To encourage regeneration, ensure that any factors contributing to the initial weed infestation are addressed such as high nutrient runoff, unrestricted human and / or excessive stock access, inappropriate fire regimes or habitat fragmentation. Where skilled bush regenerators are involved, use of regeneration "triggers" to encourage seed germination such as contour furrowing or other disturbance may be appropriate.

Planting may be required in some agricultural situations, urban areas and camphor laurel-dominated forests where few native seeds are present or in situations where important components of the ecosystem are missing. For example, planting native shrubs and / or groundcovers may be required if they are inadequately represented. Planting mature-phase rainforest species may be required if the site only supports pioneer rainforest species and is located far from any substantial remnants (i.e seed sources). Planting important food trees such as those that fruit in winter and spring may be required if they are poorly represented. Planting of native species adjacent to wildlife corridors can improve their effectiveness. Ensure that any plantings are not disturbed by future weed control or felling of trees.

Improvements in faunal habitats can be achieved by:

- managing feral animals;
- retaining (or where necessary) re-introducing fallen logs and rocks;
- maximising the area (as opposed to edge) of the revegetation zone;
- prioritising the re-instatement of understorey for small bird habitat, and;
- retaining standing dead trees and branches. (Source: Greening Australia 1999)

What species where?

- Assess each site individually;
- Regeneration / restoration projects should aim to establish **trees, shrubs and groundcovers** in an attempt to recreate previous vegetation communities;
- Planting projects should include native **replacement food** species for the range of fauna currently using camphor laurels. Plant species that provide fruit throughout the year, although as camphor laurels fruit from March to September, it is important to include species that fruit at that time and the “lean” spring time. Bird species that are known to feed on camphor laurel fruits include (source: Hackett, pers. comm.):

Rose-crowned Fruit-Dove, Wompoo Fruit-Dove, Topknot pigeon, White-headed Pigeon, Emerald Dove, Australian King Parrot, Scaly-breasted Lorikeet, Common Koel, Black-faced Cuckoo Shrike, Lewin’s Honeyeater, Silvereye, Mistletoebird, Olive-backed Oriole, Figbird, Satin Bowerbird, Regent Bowerbird, Green Catbird, Pied Butcherbird, Pied Currawong, Torresian Crow.

Alternate native “food” sources for the above fauna species are listed at the end of the chapter.

Stream banks

Stream banks require special management and appropriate species plantings.

Suitable replacement species and planting methods for riparian zones in your local catchment are listed at the end of the Kit.

Seek advice from bush regenerators, NPWS, DLWC (see chapter 12) or written publications before commencing restoration / rehabilitation. Publications by Greening Australia (1999), Kooyman (1996) and Big Scrub Rainforest Landcare Group (1998) describe methods of how to restore and regenerate bushland. NPWS Lismore district have also produced a list of native species for different site conditions within the region.