Soil Conservation Practice

ALTERNATIVE WOODLOT SPECIES

Fact Sheet SC26/98

Sustainable Options

Introduction

Alternative woodlot tree species differ from the main stream commercial species grown in New Zealand, namely Radiata pine (*Pinus radiata*) and short–rotation eucalypts (e.g. *Eucalyptus nitens*). In comparison, alternative woodlot species offer higher value timbers and can be economically viable in small plantations. They have more selective markets however, and usually require more intensive tending. They also require rotations of 35 years or more to crop maturity.

Alternative woodlot species generally have high value uses, such as furniture or cabinet making. Potential returns per cubic metre for tended trees are better than could be expected for Radiata pine. The naturally-durable timber of Monterey cypress *(Cupressus macrocarpa)* for example, currently sells for $250–$400 per cubic metre.

Good returns make small woodlots viable, and small woodlots are a useful land management tool for dealing with erosion-prone areas on farm land. Woodlots also offer a productive management option for areas of brushweed. Most alternative woodlot species respond well to being planted in line cut scrub or gorse.

A selection of alternative woodlot species is listed below. When planning any farm woodlot, a number of factors need to be considered. Apart from market prospects there are issues of site access and harvest requirements, as well as site limitations and tending requirements (see ***Sustainable Options SC21/98*** Planning Farm Woodlots). Always use seedling material from an approved/rated seed source, and seek local advice from forestry consultants, the New Zealand Farm Forestry Association and Forest Research (Rotorua).

Acacia species

The main *Acacia* species for alternative woodlot use is Tasmanian blackwood (*A.melanoxylon*). It produces wood with a dark, oak-like character suitable for cabinet making and turnery. Tasmanian blackwood is suited to sheltered sites that are moist (but not swampy) or that have a southerly aspect. (see ***Sustainable Options SC20/98)*** Uses and Management of Tasmanian Blackwood).

Establish trees at a density of 900–1200 stems per hectare (sph) to allow a high selection ratio for eventual thinning down to a final crop spacing of around 200–250 sph. Pruning can begin from the second year onwards, or when most trees are about 3m high. The aim of pruning is to produce a clear wood stem of at least 6m. To maintain growth rate, do not clear prune the trunk above 50% of the total tree height. Forks or competing leaders should also be removed at pruning and a 30cm gauge is a useful tool for determining at what size branches should be removed (anywhere on the stem).

Silver wattle (*A.dealbata*) is another *Acacia* species with woodlot potential, although its performance is still being assessed in New Zealand. It has similar wood properties as *A.melanoxylon* but is lighter in colour. Silver wattle will grow faster and tolerate dry conditions, but requires sheltered sites to maintain good form.

Cupressus species

The two main species for woodlot use are Monterey cypress (*C.macrocarpa*) and Mexican cypress (*C.lusitanica*). Monterey cypress produces a slightly darker, more grainy wood than Mexican cypress, but is more susceptible to canker disease. Cypress wood is often compared to that of kauri, and is used for similar purposes e.g. furniture, turnery or panelling. Because of its durable nature it can be used untreated as weatherboards or shingles, and is also used in boat building. *Cupressus* species generally grow well on cool southerly facing slopes, although Mexican cypress also performs well on warm sites and northern slopes. Monterey cypress is tolerant of exposed site conditions.

Establish trees at around 1100 sph (3x3m) and form prune at the end of the second season to remove forking leaders. When most trees are 3–4m high, commence side lift pruning up to a point on the trunk where its diameter is equal to 12cm. At this stage, thin the planting to 800 sph, removing poorly formed or unhealthy trees. Continue side lift pruning every two years focussing on the best 400-500 sph. Use a 12cm gauge when pruning and also remove the six largest branches above the 12cm diameter limit. When a clear pruned height of 6m has been attained, no further pruning is required. A final thin to 600 sph will then encourage diameter growth.

Eucalyptus species

A number of different *Eucalyptus* species are suitable for alternative woodlot use. Ash type Eucalypts *(*e.g. *E.saligna, E.regnans* and *E.delegatensis)* produce white timbers, while eastern blue gum types *(*e.g. *E.botryoides, E.fastigata and E.obliqua)* produce reddish timbers. These timbers can generally be used for furniture and cabinet making, as well as veneers and turnery. Like most other hardwood species, eucalypts are prone to growth stresses which can give rise to checking and distortion in sawn timber. Because this is not so pronounced in large diameter trees, saw logs with a minimum small end diameter of 40cm are recommended for harvest. This generally translates into a tree diameter at breast height (dbh) of 75cm at 35–40 years.

Site requirements vary amongst these species. *E.saligna* prefers warm sites and moderate rainfall, while *E.regnans* prefers cool, temperate sites with medium/high annual rainfall and will tolerate a frost of up to – 9°C. The hardiest ash type is *E.delegatensis* which will tolerate frosts of -12°C, as well as high rainfall if planted in a free draining soil. Amongst the eastern bluegums *E.botryoides* is similar to *E.saligna* in its site requirements and will tolerate wet sites and coastal exposure, although its form is not as good. Similarly *E.fastigata* will stand more severe conditions than *E.regnans*, although its form is not as good and it has a tendency to grow large branches. On drier sites, *E.obliqua* is a good substitute for *E.regnans* being almost as good in form although slower in growth rate.

Plant *Eucalyptus* woodlots at 1500–1600 sph making sure trees are no further apart than 3m. When most trees have grown to around 5m high thin to 1000 sph removing trees with poor form and vigour. When tree heights reach 12–15m, thin to 500 sph. Thin again at 25m, down to a final crop spacing of 70–100 sph. With this regime very little pruning is required, except for removal of persistent side branches if necessary.

Other Species

Douglas fir *(Pseudotsuga menziesii)* has a ready market in New Zealand as a light framing timber, and for uses such as internal roof beams. It has natural resistance to borer, but does not take up copper–chrome–arsenical wood preservative. It is not suitable for exposed use unless treated with oil preservatives (e.g. creosote). Douglas Fir has a relatively long rotation (40–50 years) and prefers cool, moist inland sites.

Establish Douglas fir Woodlots at 1370 sph (2.7m x 2.7m), and when trees are 10-15m high (between 12 and 17 years after planting) thin to a minimum of 300 sph, or maximum of 500 sph.

Black walnut *(Juglans nigra)* produces high value and sought-after timber, although the rotation length is at least 50 years. It requires sheltered sites with deep fertile soils. Black walnut woodlots are generally established at initial stockings of 1000–1250 sph, although this could be reduced to 600 sph if using well graded plant stock on high fertility, sheltered sites. Black walnut is a deciduous species and low initial stocking rates are not recommended on sites at risk from brushweed invasion. Thin when crown competition begins to occur and aim for a final stocking of 60–70 sph. Prune in stages to 6m, removing side branches before they exceed 50mm in diameter. Remove no more than 25% of the green crown in any one pruning operation.

Further Reading

Small Forest Management [A series of 6 booklets] published by the Ministry of Forestry (1996)

What's New in Forest Research: No. 19 A Hard Look at Douglas Fir; No. 37 Growing Eucalpyts; No. 62 Tasmanian Blackwood; No. 79 Black Walnut; No. 105 Australian Blackwood; No. 107 Establishing Eucalypts; No. 124 Eucalypts – Species Choice and Site Selection; No. 127 Growing Cypresses; No. 139 Pruning Walnut; No. 155 Eucalypts – Selecting High Quality Crop Trees. Published by Forest Research, Rotorua.

Growing Eucalypt Trees for Milling by Neil Barr, NZ Farm Forestry Association (1996)

The Cypress Growers Handbook by Stephen Brailsford. Brailsfords Forestry Management Limited, Christchurch.

The Cypresses by J T Miller and F B Knowles. FRI Bulleting No. 124.

Properties and Utilisation of Exotic Specialty Timbers Grown in New Zealand by A N Haslett. FRI Bulletin No. 119.

For further information contact a local Environment B·O·P soil conservator on freephone 0800 ENVBOP (0800 368 267)

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