Natural regeneration - case studies on the farm

July, 1999
LW0016
ISSN 1440-2106

Frankie MacLennan, Jim Robinson, Ian Higgins, Stephen Platt

This Note should be used in conjunction with Note 13. The advantages of natural regeneration over the alternatives of direct seeding or planting are considerable. The principal advantage to the farmer is the low cost, both in terms of labour and cash, of establishing large numbers of suitable plants. It is also ideal for wildlife.

Other advantages include:

Natural regeneration

can usually be accomplished with little additional equipment than that normally found on a farm

is suitable for broadscale or localised areas

maintains the local character of an area

can produce massive numbers of plants eg. 1700 000 stems/ he (White Cypress Pine, in Venning 1986); damage due to insects, rabbits, etc. is likely to affect a smaller percentage of the plants; expensive individual plant guards can often be avoided; large numbers of plants closely spaced can shelter each other.

ensures that the plants that are established are genetically related to other natural remnants and will not become environmental weekds

produces plants that are adapted to local conditions and more likely to survive, not only during establishment but over the years ahead.

Natural regeneration can be quite a simple process, as many of the examples provided here will show.

In priority order, the most likely obstacles to natural regeneration occurring on a farm are the absence of remnant vegetation from which native seeds will spread, grazing, weeds and lack of fire. Other factors may prevent regeneration. These are discussed in detail in Note 13. Hence the most common solutions involved fencing or grazing restriction, various forms of weed control and controlled burning.

Natural regeneration may not occur for a considerable time. Even when it does ocur the resulting plants may appear to be slow growing and subject to attack by pest species. This is frequently observed in the drier climates where one might presume that the newly established plants are spending more effort on establishing a root system than on above ground growth of stems and foliage. However, the ecological strategies and pest resistant qualities of local species of plants are properties, unrivalled by alternatives, that assist the landholder in the long term.

This not looks at some successful examples of natural regeneration on private farmland in Victoria.

Regeneration from rootstocks

Case 1: Graeme and Frankie MacLennan - coastal Woodside Plain, Gippsland

Method: Fence to exclude stock and promote Swamp Paperbark regeneration from existing rootstocks. Follow up planting to increase diversity.

The area is flat, overcleared and any remnants are in severe decline. Prevailing winds are from the south-west. The native vegetation, especially in the low-lying areas was Swamp Paperbark (*Melaleuca ericafolia*) with Drooping She-Oak (*Allocasuarina verticillata*) and Coastal Manna Gum (*Eucalyptus pryoriana*).

In 1978, Graeme put a central laneway, running east-west, through the sheep grazing property. A few dying sticks of Swamp Paperbark remained along the fence line; over the years, the cattle had destroyed most of the plants and any regeneration had been grazed. The laneway is 15 metres wide. It was double fenced on the southern side, leaving seven metres for natural regeneration of Swamp Paperbark. Regrowth has been rapid and dense, particularly in areas without phalaris grass (*Phalaris sp.*). Slower areas have been given some encouragement by spraying with glyphosate but this was generally unnecessary. After five or six years, good shelter was achieved.

State Government Victoria
Department of Natural Resources and Environment

Victoria The Place To Be

Note in the photograph the new shoots in the laneway which are pruned by the sheep eliminating any woody weed problems in the pasture.

The laneway (1991) can be used for emergency off-shears shelter for sheep. On a cold windy day, when using the laneway, we can appreciate the shelter it provides!

Resident reptiles also find the northern edge an ideal spot on a sunny day - there is a Red-Bellied Black Snake which Graeme sees nearly every day! The dense ti-tree is good habitat for small insectivorous birds like the Superb Fairy-wren.

With trends to wider shelterbelts, Graeme has decided to move the fence out into the southern paddock another two metres. The four wire electric fence is stock proof although the odd lamb finds a way in. I have planted some She-Oaks where there are gaps in the ti-tree. As the ti-tree grows older and taller, gaps will appear at ground level. This may necessitate some chainsaw pruning in the future. It would be impossible to achieve the same density of shelter by planting. There would be at least 20 plants to the square metre.

In our area, this has been a very successful and inexpensive way to achieve a self-sustaining shelterbelt.

Frankie MacLennan.

When horse and cattle grazing was removed from this bushland, native tussock grassesreturned from rootstocks. The resulting understory is excellent wildlife habitat and visually attractive

Case 2: Jack Frewin, Violet Town

Method: Remove stock (2 years), burn off stubble, scarify lightly. Seed source - a roadside remnant of native vegetation adjacent to the property.

Jack Frewin observed that, following an autumn stubble burn (and light soil disturbance), young native seedlings were regenerating in his paddock. The regeneration was adjacent to a remnant of native vegetation that had persisted along a narrow track bordering the property. Grey Box *Eucalyptus microcarpa* was the predominant species. Jack excluded stock (sheep) from the area for two years to allow the plants, which grew vigorously, to get well above browsing height.

To achieve a self-maintaining ecosystem, additional diversity will be necessary including a range of understorey and ground-cover plants. Total exclusion of stock is preferable.

Native understorey species may spread from the adjacent roadside, be brought in by birds or mammals, or could be sown or planted from native seed gathered nearby.

Case 3: Glenn Wilkin, Sedgewick

Method: Rabbit control, perhaps combined with a particularly good season. Seed source - an isolated remnant tree on the property.

Glenn found that a remnant native tree had successfully regenerated in a paddock that is subject to sheep grazing. He believes that a particularly successful rabbit control program combined with a 'good' year were the key factors responsible. The fastidious nature of stock may also be important. Some flocks appear to prefer the 'taste' of seedlings whilst others will leave them alone. In a good season stock may select alternative feed to young seedlings.

A range of fencing options are available for small patches in paddocks. Fencing combined with supplementary planting of other native species are recommended to achieve a self-maintaining patch of vegetation that has high farm and wildlife value.

Natural regeneration in a paddock subject to grazing.

Case 4: Peter Hamilton - Mt Camel Range, Toolleen.

Method: Soil scalping.

The Mt Camel Range, 40 km west of Bendigo, has largely been cleared of its original Drooping She Oak *Allocasuarina* and White Box *Eucalyptus albens* vegetation association. The range is grazed and so there is no natural regeneration except along roadsides. Pasture/weed growth is vigorous and is dominated by wild oats, variegated thistle, brome grasses, sub clover and sorrel. Soils are of Cambrian greenstone (very old altered basalt), a red-chocolate colour and loamy. Annual rainfall is about 550mm.

Peter has a ridgetop paddock which has had trees planted and stock excluded for the last 5-6 years. During this period there has been some favourable rainy springs, however, there is no regeneration of any of the remnant White Box *Eucalyptus albens*, Long-leaved Box *E. goniocalyx* or Yellow Box *E. melliodora* except adjacent to a roadside where works have stripped off the topsoil and cut into the gravelly subsoil and underlying rock. Here, some Long-leaved Box has established, and the reason why there is no regeneration elsewhere becomes evident. The pasture/weed growth on the graded portion, although still present, has been dramatically reduced in density and height by the removal of surface soil. Elsewhere, the weed growth is very dense and up to six foot high in early summer.

This site demonstrates that, on fertile ground in dry areas, fencing alone is unlikely to bring about regeneration due to competition for moisture by weeds. However, weed growth can be reduced in the long term by topsoil removal. This means the treatment does not have to be tied to a heavy seeding year.

WARNING: Removal of topsoil is inappropriate where native ground flora exists. It may be detrimental to plant root systems if carried out too close to the plant. Where there is a risk of erosion, precautions should be taken or this technique avoided.

Case 5: Jim Kilpatrick, Great Western

Method: Rabbit-proof fencing, knockdown herbicide treatment.

Jim has been regenerating Red Gum *Eucalyptus camaldulensis* for 5-6 years mainly to produce very cheap bare-rooted seedlings for transplanting to other parts of the farm. The property receives around 530mm of rain annually and Red Gum occurs on the lower parts of creek flats with some Yellow Box *E. melliodora* grading to Yellow Box-Yellow Gum *E. leucoxylon* on the higher portions of the flats. Soils are duplex clay but fairly silty. Pastures consist of rye, bromes, barley grasses and silver grasses *Vulpia sp*, capeweed and sub clover i.e. predominantly annual species.

Jim selects trees with a large seed crop in early winter. He then sprays glyphosate herbicide (e.g. Round Up) at the appropriate rate during the first warm days at the end of winter (usually mid-August).

If the pasture/weed growth is more substantial than usual he would spray four weeks earlier than this and respray in mid-late August.

Jim has observed that most of his Red Gums start dropping their seed with the first warm days of late winter (this may not be the case elsewhere). Seedlings are first visible in mid-late September and Jim points out that soil moisture over this two week period is *critical*, good results depending on adequate rainfall.

Areas of poorer soil, e.g. gravels, should be avoided in favour of more moisture-retentive ground and he suggests that microclimatic effects are very important e.g. avoid exposed windy areas, north facing slopes, etc.). Jim avoids ripping as he believes it would reduce surface moisture. Top dressing pasture with superphosphate will increase the weed growth in the following year(s) and should therefore be avoided in areas where revegetation is contemplated. Jim uses an undercutting blade 'plough' to cut the seedling's tap roots and produce healthy bare- rooted seedlings.

Problems: Apart from unreliable spring rains the main problem is grasshoppers which can decimate Red Gum seedlings in their first season. Jim considers rabbit netting vital to success in his area, even though rabbits are not in large numbers. Successful regeneration has also occurred

through fencing alone, although it may take a few years for weeds to become less dominant and regeneration is *more* dependent on good spring rains.

Case 6: Rochester/Corryong

Observation of natural regeneration in a paddock south-east of Rochester, in north-central Victoria, indicates that natural regeneration has been inhibited near to the parent plants. Chemical inhibition (allelopathy) or other forms of competition may be involved.

Fencing should be placed beyond the dripline and downwind of seed plants, such as in this example from near Corryong in north-east Victoria, to avoid this effect.

Ian Higgins (DCE Bendigo), Frankie MacLennan (Land for Wildlife-Yarram) and Jim Robinson (Greening Australia-Victoria) contributed to this Note.

Further reading:

Land for Wildlife Note No. 13.

Curtis, D., (1991), Monitoring Regeneration, in Offor, T. & Watson, R., (1991), *Growback '91*, Growback Publications.