

Seed Production for Local Revegetation

Joanna Seabrook

Greening Australia (WA), WA Wildflower Society

The need for Seed Orchards

A seed orchard is a plantation of plants grown specifically for the purpose of producing seed. In this case seed of native Australian plants, to make seed available for revegetation and to offset the diminishing number of plants in the wild.

In the early summer of last year I was involved in expeditions to the wheatbelt of Western Australia to collect seed for Greening Australia. It immediately became apparent how scarce the plants had become, in fact, there was considerable difficulty in finding plants to collect seed from; a great deal of the time was spent searching for appropriate species. I am not familiar with similar cereal growing districts in other states but have no doubt the vegetation is in much the same condition.

I do not intend to harp on the degradation that is occurring in the agricultural countryside except to say that we have to turn it around, and I believe we can, but not so easily as may be thought. I don't believe that wholesale planting of trees will be an effective solution, this is the easy way, it is not hard to grow a tree, what is going to be hard is to protect it from all the bugs that may attack it.

As I am nearly the last speaker I have no doubt that we will have already heard of all the bugs and beasties which are helping to cause the decline of trees across the country and the absence of predators to keep them in check.

We all know that revegetation is needed, the question is what do we mean when we say revegetation, is it plantations of trees? or is it reestablishment of vegetation?

I mean to advance arguments to illustrate the necessity for an understorey in plantings and to illustrate a way it may be achieved. Trees alone are almost a monoculture and, as such, subject to all the problems of monocultures. In agriculture most of these problems have been dealt with by large applications of chemicals, this is becoming unacceptable, especially in the case of revegetation, where we are trying to establish some kind of ecosystem in the hope of achieving a balance between predator and prey.

In greening groups the thinking seems to be directed solely to the mechanics of getting trees in the ground, rather than how to repair the disruptions to the functions of nature caused by people activities. Speed, as in a billion trees in a year, seems to be the watchword rather than quality or effectiveness of revegetation. To my way of thinking it doesn't matter if we do it slowly as long as we do it right.

We need to try to copy nature, to be worthwhile revegetation needs to have some ecological basis. We should try to create a habitat which would encourage the natural predators of the bugs to prosper and thus keep the bugs in check. The way to do this is to grow an understorey of native flowering shrubs to supply nectar, seeds and shelter thus providing circumstances where an ecosystem may be able to develop.

A method by which this could be achieved would be by direct seeding a mix of tree and other suitable native plant seed. If this were to be done over large areas the difficulty would be in obtaining enough seed of the needed plants. It may be possible in those parts of the country which are still vegetated but in those largely cleared areas used for cereal production, where revegetation is most needed, the original

native plants have all but disappeared. Even in a forest situation it is not easy to collect enough seed for the purpose of direct seeding.

Buying seed is an alternative but it is very expensive, often costing hundreds of dollars a kilo. In addition it is difficult to condone commercial seed collection from the wild, serious damage may be done to the plants it is collected from, trampling of young plants is bound to occur and there is a great risk of disease being carried into bush areas. Should mixed seeding become an accepted method of revegetation, seed supplies would not meet demand, seed would need to be produced and the market would expand. A further consideration in regard to seed production is the importance that is now attached to provenance plus the need to grow local plants for local areas.

I hope I have illustrated the need for variety in revegetation and also the need to produce seed. I can be grown like any other crop and with somewhat less trouble and expense. The seed orchard at Mundaring has been grown by the Eastern Hills Branch of the Western Australian Wildflower Society. It is very small and should be regarded as a demonstration model. It occupies less than 1/10 of a hectare of land. It is growing in a gravel pit where there is very little soil and yet the- plants have been successful for 11 years and for the last few years have produced \$1100.00 to \$1200.00 worth of seed annually (retail catalogue price).

Everyone from other parts of Australia is not familiar with the kind of gravel we have in Western Australia. It comes from a laterite formation and is made up of round pebbles and composed with varying quantities of clay. Every kind of gravel is not suitable for road making according to whether it has enough or too much clay. Vast quantities of this gravel are used in road making and it is almost always extracted from forested land, leaving open pits which often cover some hectares. The process of obtaining this gravel is known as 'winning gravel' and the pits are known as 'borrow pits', an example of bureaucratic jargon.

Actually growing the seed orchard proved to be very easy. The main requirements were the seed and the land. The local shire was asked if they could allow us a piece of land and in return we would supply them with seed for revegetation work. At this stage there is no certainty of success, however, it was thought at best we would produce seed and at worst the area used would be rehabilitated. The Shire suggested the gravel pit and offered the use of machinery for ripping. There was no topsoil left to spread but there were some dumps of soil present.

Seeding was carried out after the first autumn rains, which in this year of 1979, was the 7th May. Germination astonished us all and the plants have never looked back. We were able to start harvesting seed of some plants, particularly acacias in the second spring, the amount of seed we harvested each year built up very quickly. All the seed was donated to the Shire and used for revegetation on newly graded road verges and in gravel pits.

After some years of success we began to understand the importance of the seed orchard idea. By this time we had put in two or three more rows of plants with similar success. So just to prove it was no fluke we have planted up a second area which I will show in the slides.

To recap operations in growing a seed orchard:

Seed of all species were hand broadcast in rows directly on to the ground. Weed was not covered.

A mixture of sand and sawdust was used as a medium to bulk out the seed and facilitate broadcasting.

No maintenance has ever been needed, nor should be. Unfortunately the soil dumps I mentioned were full of weed seed, so we had to do weeding.

No watering should ever be necessary if local plants are grown. However in very low rainfall areas it may be necessary to encourage and support germination. (We have no experience of this.)

Rows of plants need to be well spaced, leaving room for growth of plants or in case it is thought that machinery may be needed for weed control.

Seeding should be carried out at whatever time germination would naturally occur. In Western Australia this is the autumn when the seedlings will be supported by winter and spring rains and while it is still warm enough to germinate seeds.

Fencing is not necessary unless for a specific purpose such as rabbits or stock. Sometimes if a seed orchard is in a town it will be necessary to guard against pedestrians or children.

If the land is on a slope it will be an advantage to make drainage so that heavy rain will not cause washing out of seeds.

If an orchard is to be grown in a very windy or a sandy area it may be necessary to grow a cover crop such as cereal rye or triticale for shelter in the first year. In either of these cases it would be an advantage to grow a row of suitable shelter shrubs on the windward side.

The revegetation work by the Shire in the gravel pits has produced very good results, all of the species from the seed orchard are well represented and in addition local tree seed, collected separately has germinated and grown well.

In the early years broadcasting was carried out by hand. The first large scale seeding was in 1985 when a superspreader was used for the purpose. This was a remarkable success and there are now five years of revegetation by this method all with equally good results.

The use of a superspreader for broadcasting seed has a number of benefits. Firstly, most farmers have one, so availability is good and expense spared. It could be used in situations where a farm combine or other seeding machine is not available. If a combine is to be used it is often necessary to wait until after crop seeding is completed, thus missing the prime time for seeding. Using the superspreader, provided the necessary preparations have been made beforehand, the job can be accomplished very quickly.

In the gravel pits superphosphate was used as a medium to mix the seed, on farmland a mixture of sand and sawdust was used as it was thought extra fertiliser would increase the weed problem.

Revegetation by Alcoa in the areas mined for bauxite has also taken a new turn with the company broadcasting tree seed in the same mix as the understorey seed. For the first two years the broadcast trees lagged behind the potted and handplanted trees but in the third and fourth years the broadcast trees caught up and passed the handplanted trees.

I believe there is some urgency for an understanding that trees alone will not mend the situation. A good deal of the revegetation needs to be done on farms and farmers do not have an unlimited amount of land which can be spared for production to grow vegetation. I am aware of the arguments this statement can raise but I think it is true. If the land which can be made available for revegetation is used to throw in thousands of trees, it would seem an impossible task to introduce an understorey, whereas if direct seeding is the method of revegetation to be used, seed of native understorey shrubbery may be included in the seed mix and will germinate just as readily as the tree seed.

Given the ingenuity of the human race, our ability to fly to the moon and to split the atom, I am sure if we put our mind to it we can overcome the problems in a simple matter of growing the vegetation which has already evolved to suit the country.