# NATIVE SEED IN AUSTRALIA: A COMMUNITY PERSPECTIVE

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**ABSTRACT**

*This paper presents some of FloraBank's findings about the way native seed is collected, stored and handled at the community level. Based on our experiences and the close relationship between FloraBank and the Bushcare Support network, this paper also provides insights into community issues and attitudes to the availability and quality of native seed for revegetation and conservation purposes.*

## INTRODUCTION

During 1998, FloraBank conducted a survey into native seed collection, storage and distribution in Australia. In particular, the survey looked at the role of community-based seed collection and supply operations that support landcare and other community-based revegetation initiatives. The survey was conducted as part of the FloraBank project, which is managed by Greening Australia, in partnership with CSIRO Forestry and Forest Products through the Australian Tree Seed Centre, and the Australian National Botanic Gardens. The Bushcare program of the Commonwealth's Natural Heritage Trust funds FloraBank. The survey comprised a national tour of seedbanks, structured consultations with stakeholders, a national questionnaire and minor literature review.

The published results of the survey (Mortlock 1999) broadly describe the collection, storage and distribution of native plant seed for revegetation purposes across Australia. The major users of seed are identified in all sectors of the community, including government, mining and commercial operations. The report looked at the availability and quality of seed as a raw material, and touched on how and where native seed is actually used. It described the current operations and practices of community seed operations and how they integrate with commercial and government seed suppliers. FloraBank has broadly identified the issues and needs of community based seed collection and supply operations, and developed strategic approaches that have recently been the subject of public review (Mortlock, 1998).

This paper presents some of FloraBank's findings about the way native seed is collected, stored and handled at the community level. Based on our experiences and the close relationship between FloraBank and the Bushcare Support network, this paper also provides insights into community issues and attitudes to the availability and quality of native seed for revegetation and conservation purposes.

## 1. THE NATIVE SEED SECTOR

Across Australia, demand for native seed has increased significantly over the last decade. This increase is generally attributed to changing attitudes in the wider community and growing awareness and greater effort in replanting native species. Landcare is a prominent agent of change. So, too, are changes in planning, mining, forestry and development

legislation that affect standards of land management and rehabilitation practice. The rise of direct seeding practices and, to a lesser extent, mass planting techniques using seedlings (tubestock) accounts for a lot of this increased demand. Seed is the major raw material used for propagating native plants in Australia and it is generally only where seed is not available that other plant materials are used. It is the seed that creates new growth and dictates much of the outcome of our planting work, whether we are motivated by production and profitability, habitat construction, or landscape healing and stability. While 53% of respondents[1] to the questionnaire nationally use propagation materials other than seed to propagate native plants, consultation suggested the amount used is small. In addition, only 16% store, sell or distribute these materials. Seed is the cheapest and most suitable means for large-scale establishment of native plants.

Looking nationally at what may be termed the *native seed sector*[2], consultation with key seed suppliers suggested that the greatest demand (and the greatest increase in demand) for seed now comes from mining companies using native species for rehabilitation of mined areas: consuming 70% to 80% of all seed collected. Almost all the seed they use is either collected or supplied by commercial operators. Probably next most important are the revegetation projects of individual landowners, landcare groups and agencies, followed by the revegetation activities of state and local authorities on roadsides and reserves: consuming 10% to 20% of all seed collected. A large part of this seed is supplied by community collection and storage operations. Lesser seed users are forestry and collection for bushfood, which are also supplied by commercial operators.

At the state level, this ranking of users also occurs in Queensland, New South Wales, Victoria and Western Australia. These are all states in which there are regions (Central Queensland, Hunter Valley, Gippsland, Pilbara and south-west Western Australia respectively) where the mining industry uses native seed extensively. In South Australia and the Northern Territory there is comparatively little mining activity and the community seed sector and bush food operations are the major users. In Tasmania, forestry and the community seed sector are the big users of native seed.

In revegetation, most seed is planted by mining companies using direct seeding methods. However, the area covered is small compared to that covered by revegetation through landcare which, for the most part, still relies heavily on planting seedlings (tubestock). Comparatively little seed but a much larger range of species is typically used by nurseries to produce tubestock. Direct seeding typically uses a limited number of species (usually less than 25) selected for their site worthiness, availability and ease of establishment.

## 2. OPERATIONS AT THE COMMUNITY LEVEL

The ‘community’ referred to above includes individuals, landholders, community groups and other grass roots organisations involved in landcare, revegetation and the restoration of Australian native plant communities. In general, it is non-government and non-commercial, although there are overlaps and commercial and government interests and sponsorships in some community-based seed operations. These distinctions are used for comparison rather than as definitions.

Individuals and groups in the community are collecting, storing and using more seed than ever before – especially in landcare revegetation initiatives. However, their number is small by comparison, for example, with the number of people involved in planting native trees and shrubs in landcare initiatives. The FloraBank survey indicated that those who do collect seed would appear to be key people in the landcare community, with a wider involvement in

revegetation. Most also clean and store seed, are involved in the use of native seed and raise seedlings for replanting (which most carry out themselves). About half are also involved in direct seeding and a little more than half in managing natural regeneration. The primary purpose for seed storage is either for use in specific replanting projects or to distribute (non-profit) for revegetation. These community operators are much more likely to distribute seed for free than sell it, and do so to (in order of importance) community groups, farmers and landholders, direct seeders and community nurseries.

The quantity of seed collected and stored by the community-based seed operations is only a small fraction of the total annual seed turnover of the commercial and government native seed sectors. Seed is collected, sometimes in large quantities, for immediate use in specific revegetation projects or for use in the next growing season. It is difficult to establish just how many people collect a bit of seed for their own use. It is likely that the rapid uptake in direct seeding in some areas has seen a similarly rapid increase in seed harvesting to supply direct seeding machines operated by groups and individuals. Such community 'collect and use' operations differ from 'community seedstores' and 'community seedbanks'. The distinction is largely a matter of scale and purpose, and the period of storage involved. A **seedstore** is a small-scale *temporary* facility for short-term storage and services the needs of one or more specific revegetation projects. A **seedbank** is a more *permanent* facility with some commitment to meeting ongoing seed needs – revegetation projects or otherwise – in a region. A seedbank, unlike a seedstore, does much more than just collect and store seed.

## 2.1 Community seedstores

You find seedstores maintained by 'friends of' groups, schools, landcare groups and centres, catchment management groups and centres, individual landholders, environmental groups, small community nurseries, local government offices, societies for growing Australian plants, Men of the Trees branches, and many others. Seed is typically stored for later use in nursery propagation of seedlings for specific revegetation or garden projects. Projects do include direct seeding, and large quantities of seed may be temporarily stored until sowing. Seedstores typically store up to 50 indigenous species. There were 65 respondents to the questionnaire who store less than 20 kilograms of seed, and a further 60 who store seed but did not indicate exactly how much. Most, if not all, of these respondents may be considered as seedstores. There are possibly three times as many seedstores in the community as seedbanks and currently in the order of 200 to 300 seedstores nationally. Many community operators store seed from time to time but would not consider their operation to be a seedbank.

There is considerable variation in the standard of collection and storage practices, and technical understanding of key issues such as maintenance of biodiversity and provenance. Most seedstores operate from a very small financial base (often entirely voluntary) and a reliance on funding to meet the costs of major projects. There may be little extension, training or coordination provided to the community, even at the local level.

The project and local area focus means that there is little obvious duplication of resources or overlap of effort between seedstores in the community. Project seed needs may be satisfied through local collection by group members or volunteers, through contract collectors, through purchase from seed merchants or through a community seedbank in that region.

## 2.2 Community seedbanks

Community seedbanks account for the majority of seed stored by the community seed sector. They have started popping up all over Australia, run by community groups, landcare and catchment management groups, community nurseries and non-government organisations. Indications are that many are operated under community partnerships rather

than by single groups. Greening Australia Limited manages, or is a partner in, about half of the community seedbanks in Australia. There are also seedbanks operated by government, primarily in support of community revegetation initiatives; for example, Capricorn Seedbank Project at Livingston Shire (Qld) and Native Plant Seedbank at Central Queensland University.

Seedbanks perform the vital role of storing seed that may be used during drought or unfavourable seasons when seed is scarce in the bush. This carry-over role allows revegetation initiatives to continue where they otherwise could not. The survey established that only a small proportion of seed is stored for longer than 5 years.

Despite their name, community seedbanks often do more than just supply seed. Almost all perform the following roles, with about equal importance, throughout their region:

- Provide extension, education and training in the community to encourage and develop local capacity for wider use of native seed.
- Provide assistance, training, coordination and facilitation for seedstore operators and staff or volunteers of local projects that have a seed use component.
- Supply seed to a wide range of users for propagating plants in nursery situations, or direct seeding for specific revegetation projects – including seedstores.

They promote and develop an understanding of the local flora and seed collection from it. Seedbanks quickly become involved in revegetation initiatives generally in a region and may have important strategic roles, such as coordination of seed collection and supply.
In comparison to seedstores, seedbanks collect and store larger amounts of seed of a greater range of species from a region. Although standards of collection and storage practice do vary, they are generally of a higher standard than for seedstores.

About 38 community seedbanks currently operating are known to FloraBank and it is estimated that no more than 50 currently operate in Australia, although the number is increasing rapidly. Most of the 38 known community seedbanks currently operating are located in New South Wales (12), South Australia (8) and Victoria (7), including most of those three years or older (there are 10 of these). The dominance of the south-eastern states seems to reflect a longer history of landcare, a greater use of direct seeding, and historical preference for using indigenous species. There are four in each of Queensland, Western Australia and the Northern Territory, most of which are just establishing, and one seedbank Tasmania and the Australian Capital Territory. All of these seedbanks have come into being in the last 10 years. Recently, FloraBank and Environment Australia tallied the number of community seedbanks currently funded as seedbanks under the Natural Heritage Trust and Bushcare program at 24 nationally. There are, however, at least a further 20 initiatives to establish community seedbanks currently not funded. There are also seedbanks established under funding for other landcare projects.

The size of seedbanks and the scale of operation quickly increase in direct proportion to their involvement in revegetation in that region, and in particular in direct seeding or major replanting projects. Seedbanks rely on government, sponsorship, host organisations and volunteers for funding and resources, and to meet operating and major project costs.
Currently, the capacity of community seedbanks is typically small compared to those in the commercial and government sectors. Only 9 seedbanks of the 23 that responded to the questionnaire currently store in excess of 50 kilograms of seed.

Most, if not all, community seedbanks operate at the regional level. Indeed, many seedbanks are specifically created through community initiative to take a regional focus for seed supply,

extension, seed storage and multi-project service roles. Many are managed by steering committees that include representatives from many groups, organisations, agencies and businesses in the regional community. Most regions of Australia do not have a community seedbank. Consultation established that many consider demand for indigenous seed is already sufficient in some regions of Australia that more community seedbanks could be established, for example, south-west New South Wales, south-east Queensland. In some regions seedbank operators consider that a number of community seedbanks will almost certainly be required to meet demand. More than one seedbank may also be required where, for example:

- seedbanks specialise in the vegetation types (wetland, forest, grasses), volumes of seed (direct seeding supply), or distribution on a non-profit or profit basis
- geographic isolation or community structure suggests sub-regional coverage.

There was no evidence from the survey of overlapping seedbank jurisdictions or that resources are duplicated or wasted. Indeed, were geographic overlap to occur, the functional roles and specialisations of seedbanks may not overlap, nor necessarily would resources be wasted. Seedstore and seedbank roles in any region are generally complementary and may establish independently. Seedbanks do not replace or make redundant the seedstores already located in a region, nor do they necessarily duplicate resources or create overlap of effort with seedstores.

## 3. KEY ISSUES FROM A COMMUNITY PERSPECTIVE

### 3.1 The role of community seed operations

Community seedbanks arise primarily in response to local and regional needs for improving the stewardship of the land through revegetation, restoration and conservation initiatives. State legislation and state government policies create some of the context in which community seed collectors operate. However, the great variation in the nature of community seed operations at the regional level arises primarily in response to regional variants such as the vegetation type, climate, agricultural mix and approach to landcare and conservation. Seed is collected and stored at the community level primarily because native seed of a range of species in demand is not available commercially or, if available commercially, is of inappropriate provenance, limited quantity or too high a cost. An allied motivation is that many communities seek to better understand local species and promote their use in revegetation or the restoration of local plant communities. Largely this is a recognition of the role of local species and provenances in protecting biodiversity, but it is also widely reported that local provenances often perform better in local conditions that those from further afield. In a sample of 127 community respondents to the survey, 73% indicated that ‘use in specific revegetation projects’ was a primary purpose for seed storage. However, 24% indicated that ‘species conservation’ was a primary purpose. Finally, seed collecting is fun for many people and even basic skills empower and build capacity in local commuities to bring back the bush.

The community seedbank in particular is a recent phenomenon that is yet to find its full potential. Most seed collection operations and even some community seedbanks appear to be viewed by their operators as a necessary adjunct, or an extension vehicle, to the main game – revegetation. However, others are clearly dedicated attempts by the community to step up the pace or change the practices of revegetation, by building capacity and supplying essential raw materials in a region. Viewed as a whole, there is arguably a ‘critical mass’ to be reached before some of the potential roles for a community seed supply capacity are realised, or even known. The greatest contribution made by seedbanks is likely to be in extension, awareness, networking, education and training rather than simply in seed supply, which often results only because seed required is not currently commercially available.

One gets the solid impression that community operators consider there are nowhere near enough seed collection, seedstores, and seedbanks currently operating. Where landcare and community revegetation projects continue to create demand, or there is a switch from using tubestock to direct seeding, it is very likely that the trend for increased seed collection in the community will also continue, for the reasons noted above. There is a strong call from the community for government to support this trend and provide secure conditions under which seedbanks may establish.

### 3.2 Using local indigenous seed

Seed users are increasingly unwilling to use seed of unknown or far-off origins and there is a strong trend in the community to specify local indigenous seed for revegetation. This trend is commendable and should be supported. The use of local seed is generally accepted as desirable, and preferred to the use of seed from far off or unknown origins. Many seed users have practical experience that seeds from local plants are better adapted to local conditions and perform better than those from further afield. Using local plants also helps to maintain the genetic integrity and unique characters of vegetation remnants and is good practice for conserving biodiversity. These are strongly recognized tenets of community operators consulted by FloraBank.

However the use of local indigenous seed can pose a number of problems which are generally less well appreciated. The approach is a 'best guess' rarely based on understanding of the actual genetics of plant communities. The definition of 'local' varies but is expressed most often as a distance (for example, a 15-kilometre radius) from the planting site, or in terms of catchment, land system, bioregion or even local government boundaries. It may be unnecessary to use of locally collected seed in preference to regionally collected seed, an ecovar, or even seed collected within that state, depending on the genetic characteristics of the species. Restricting seed supply to local provenance can greatly reduce the availability of seed, the range of species that are broadcast and may result in the broadcasting of poor quality seed if locally the season is poor, or plants are of poor genetic quality. A key question is; how local should 'local' be? There are greater difficulties and costs in collecting adequate quantities of viable seed from a relatively small and restricted area. We often lack the knowledge (and there are no records) about the real origins of some local vegetation. It is often the case that roadside and reserve vegetation includes trees and shrubs that may well have been planted (long ago) from seed sourced elsewhere.

Further, non local seed may be more desirable than local seed where an environment has changed or is modified such that local provenances are now less adapted to the conditions. Non provenance seed may also better fulfil the requirements of revegetation for a particular purpose, such as amenity planting on road verges, plantings for high water use, agroforestry, fence posts, firewood, shelter, etc.

### 3.3 Local indigenous seed supply

Native plant seed of many species is of course readily available on the commercial market. Commercial seed suppliers have the potential to collect and supply seed from almost anywhere to anyone. It must be logistically possible and profitable to do so, and there must be adequate prior notice for collectors to find and harvest seed. The physical quality of seed available commercially (but not necessarily genetic quality and known provenance) is generally well regarded and the prices generally low, considering the cost of collection and

storage. Seed that is indigenous to the local area of the user, however, can be much more difficult to obtain commercially.

Many community seed users reported that they are unable to source any local indigenous seed or have difficulty obtaining a reasonable range of species in the quantities required. The questionnaire found that 15% of community seed users usually have such difficulties and a further 35% sometimes do. The survey indicated that South Australia is the easiest state in which to source local seed (from any source) and the Northern Territory and Queensland are the most difficult. In most states, indications are that the availability of seed varies from region to region. Indigenous seed is generally available for some regions but not others, and within all regions there are local areas for which little or no local indigenous seed is available.

While 93% of the 167 community sector respondents collect seed, only 45% buy any seed from commercial suppliers and the average amount bought is 9% of their total requirements. The great majority (88%) of those who buy seed buy less than 10% of the total seed used and only 5% buy more than 50% of requirements. It is logical that not all respondents, of whom 93% collect seed, will buy seed. But many of the groups and organisations who responded would have wider seed needs than one assumes could be met by their own collection activities alone. So these operators already depend heavily for their local indigenous seed needs on the capacity of community-based seed collection and storage operations. Community seedbanks are responsible for supplying much of this seed, but there may also be significant quantities collected in some areas by individual landholders for use on their land.

The most likely motivations for not buying seed are that:
- community respondents are unable to afford the cost of seed available commercially
- seed available commercially is of unsuitable species or provenance for local use
- seed cannot be found commercially or is not available in the quantities required.

The questionnaire found that most seed collectors, including commercial collectors, tend to collect seed in their local area. So, the nearer you are to the collection areas of commercial or community suppliers, the easier it will be to obtain local indigenous seed. There are still many areas where commercial suppliers simply do not operate or do not supply indigenous seed. There are also many regions where no community-based seed suppliers operate. Even where commercial or community suppliers do supply local indigenous seed, there may be considerable natural, logistical, and bureaucratic barriers to collection.

The factors responsible for collection difficulties include:
- lack of vegetation
- seasonal scarcity of seed
- logistical, climatic and environmental difficulties in seed collection
- the need for constant surveillance of seed set
- the need for good timing for collection when seed is mature.

There are also large gaps in available information on key aspects of collection and storage practice for many species.

All these factors may vary greatly between regions and contribute greatly to regional scarcity. Describing the variation in these factors at a regional level is a major undertaking. Determining exactly which regions experience scarcity of local indigenous seed is also a considerable undertaking. While some indicators of regional scarcity were found, a definitive assessment of these factors was not undertaken during the 1998 survey.

Commercial suppliers have been quick to respond to tender specifications that increasingly call for indigenous seed collection and supply for projects, for example, roadworks, mining rehabilitation and major infrastructure projects. However, it appears that commercial suppliers have been slow to respond to the increasing demand for local indigenous seed by community groups and landholders for their revegetation projects. It is very likely to be uneconomic for commercial collectors to collect a range of local indigenous seed for all regions of a state. The logistical and environmental difficulties involved in collecting seed across vast areas are formidable. In addition, the demand in terms of volume of seed may be small and profit margins may be non-existent. The extent of demand varies regionally and is the subject of diverse view. It was not adequately surveyed in 1998, but is the subject of current work by FloraBank.

Most commercial suppliers consulted consider that better planning in community projects to provide a longer lead-time for seed collection is essential to improving the commercial availability of local seed. However, this is likely to make a difference only where demand is sufficient to interest commercial collectors in the first place.

### 3.4 A system based on trust

A further difficulty here is that seed users must trust that the seed purchased from their supplier comes from the locality claimed, for there is no other practical way of determining seed origins. There is currently no native seed certification system operating in Australia to regulate or standardise seed quality. There is frustration among community seed users at the difficulty in obtaining sufficient information about the origins of seed available commercially. The questionnaire found that while 37% of all respondents consider that commercial suppliers usually provide sufficient information about seed, the remainder consider that they only sometimes, rarely or never do. This is particularly true of respondents to the questionnaire in Queensland and New South Wales, but less so for respondents from Tasmania, South Australia, Northern Territory and Western Australia. Among community respondents, half considered that commercial suppliers rarely or never provide sufficient information.

### 3.5 Genetic quality of 'revegetation grade' seed

During consultation there were no concerns expressed about the physical quality of seed available commercially, however, the genetic quality of seed is another matter. Genetic quality is concerned with how representative seed collected is of its parent population, and most guidelines available are for (more stringent) flora conservation purposes rather than for revegetation. A key concern is from how narrow a genetic base (how few plants) seed is collected. Consultation indicated that many commercial collectors would have little time for genetic parentage considerations and would be more inclined to use collection strategies that maximise seed return for minimum effort.

### 3.6 Seed resource

Consultation determined that the seed resource available in the bush is poor over large areas of Australia, although good in other areas. There is a lack of remnant vegetation and small numbers of plants left to collect from in many areas. In many remnants the seed resource is all but gone or is inadequate from a genetic viewpoint. This is largely a consequence of the combined effects of human presence, our land use and land management, and general decline of the vegetation, especially the understorey.

We need to better understand the genetic resources of remnant vegetation. As a priority, access to seed should be improved in areas where seed is scarce in the bush, rather than in

well-vegetated regions where seed is more abundant. Restricted access to highly diverse bushland reserves and national parks also causes concern to questionnaire respondents, especially where these may be the only sources of seed available in a region. On the other hand, there are genuine concerns about 'opening up' national parks and conservation areas to increased seed harvesting.

### 3.7 Community seed production areas

There is a growing recognition in the community that, if carefully established, seed production areas could be used to supply local indigenous seed to community group and landholder revegetation projects. The survey demonstrated that very few in the community sector (slightly more in the commercial sector) currently collect seed from seed production areas. However, there is much discussion and great potential for seed production areas, for example:

- where certain local species are in high demand locally
- where genetic rejuvenation of remnant vegetation in an area is needed
- where established as part of wider revegetation or rehabilitation initiatives.

Long-term land tenure, access and management and good quality local seed (genetic quality) are prerequisites for establishing seed production areas. Such areas may be established and maintained locally by local and state government, landcare groups and landholders. However, there is very little practical guidance or information available on what to do, where and how. This is to be addressed in the current FloraBank project.

### 3.8 Imported native seed

There were reports of native seed being imported into Australia for revegetation at very low prices from overseas suppliers. While the cost may indeed be lower, there is widespread concern and condemnation in the community and among commercial and government suppliers about this practice. Much overseas seed (but not all) is reported to be inferior and often poorly identified and labelled, or in seedlots where species are intermixed and contaminated with other seed. There are concerns about the genetic origins and hybridisation of such seed, and the possible effects of such introductions on biodiversity and the introduction of plant pathogens as yet unknown. Many in the community are of the opinion that revegetation seed needs should and can be met from within Australia, with an increasing emphasis on matching known provenance to the area of use.

### 3.9 Regulations

Frequent concerns were raised at discussion forums and by questionnaire respondents about the problems of regulation, royalty and permit systems and their significant impediment to seed collection. Many expressed concern at the generally counter-productive trend to 'lock up' seed resources and increasingly restrict access to them. There is a recent trend for local authorities to also introduce restrictive seed collection policies on collectors, regardless of their reasons for collection or technical competence.

Considerable differences in regulatory approaches between the states are apparent. Seed collection may fall under the jurisdictions of land management and flora protection legislation, forest production royalty systems, and interstate export and import regulations, requiring that a collector be conversant with many requirements in each state. There are often considerable fees attached to approvals and permits, and anecdotal evidence that these may be restricting collection practice. Royalty systems were criticised for unfairly grouping seed collection with wildflower harvesting and other forest production, resulting in royalties set at too high a level.

Regulatory authorities and some others in the native seed sector increasingly promote certification for native seed collectors. Commercial rather than community collectors appear to be the main target of such moves. Community collectors and seedbank operators can do much to deliver real improvements in standards of practice and quality control other than through a certification scheme.

### 3.10 Information sharing and awareness

Anyone can readily collect seed and use it to propagate seedlings. But to do this on any scale, in every season, for a wide range of local plants, and deliver viable seed for successful propagation is demanding and not an endeavour to be taken lightly. To do it cost-effectively, where so much depends on seasonal factors, adds an extra element of difficulty. You can spend a lifetime learning to do it in one region, and only a handful of people can do it for the plants of their whole state or for Australia.

Newcomers must overcome considerable hurdles, such as:

- accurately identifying flora in the field
- understanding seed biology and ecology
- learning when and where to collect seed
- the secrets of germination and viability testing.

Seed drying, extraction, cleaning and storage are technical disciplines in the wider agricultural seed industry in which technicians may spend a lifetime at work. These disciplines are much less well understood for native seed than for agricultural seed. In some cases this knowledge is hard won and closely guarded by commercial seed collectors, merchants and native plant nurseries.

Collecting seed for long-term conservation purposes adds to this complexity still further, with the requirement for scientific rigour in the way that genetic parentage is understood and documented, seed is handled, treated and stored, and viability is monitored. It is generally only the major academic and research facilities in Australia that are capable of operating long-term low-temperature and cryogenic storage.

There is little sharing of information in the native seed sector, despite great need. Individual user groups such as gardeners, mining companies, nursery operators and regenerators share information to some extent within their groups, but seldom between groups. These user groups have considerable technical expertise that is often not written down and there is much to be gained from greater information sharing.

There is a great need for networking among community practitioners about native seed to avoid the prospect of waste and duplication, and to increase cost-effectiveness. Better promotion and awareness of the value (especially economic value) of the native seed resource is needed, as well as the best approaches to its management. Much seed is wasted during vegetation clearance operations, roadworks, bushfires, etc. Private landholders, local authorities and state governments need to be more aware of their seed resource and ensure that it is well utilized as well as protected.

Knowledge about native seed is increasing in parallel with the increasing interest in revegetation using native species. However, not many people in our community know anything much about seeds, much less seeds of our own native plants. Indeed, not much is known about native seed collection, storage and use in Australia outside of the native seed sector. Another way of saying this is that most of what we know about native seed is held in the minds of the relatively few people in the native seed sector and much is not written down.

There is a steep learning curve ahead of anyone who wishes to collect, store or use native seed in any serious or dedicated way and there are few Australian references to assist. It is difficult for people to get access to and stay abreast of the ever-changing information now available on species viability and germination alone.

Despite these difficulties, there are a growing number of people in the community learning more about native seeds. It is a vital role for community extension programs at state and national levels to package information to assist such people. During consultation, many reported that the state of our knowledge about seed collection, storage and germination limits our capacity to revegetate and almost certainly our ability to maintain and improve biodiversity. Also widely reported was a great need for research into the storage, propagation, establishment and management of a wider range of species. The Third Native Seed Biology for Revegetation Workshop is a gathering of experts. That which you know is of great significance to the wider revegetation community and the effort to restore and revegetate plant communities, rehabilitate degraded lands and habitat, and protect biodiversity. FloraBank encourages you to transfer your knowledge to the community as an individual or at a corporate level in a clear and concerted way.

## 4.0 AN EMERGING PARTNERSHIP

It could be argued that the native seed sector, and within it the native seed industry, has recently as never before come to the attention of the wider revegetation community. The operations of government and commercial seed operations are coming under scrutiny as perhaps never before. Concerns about collection practices, biodiversity protection, conservation, the protection of the seed resource are translating into regulations and controls, permits and codes of practice.

The last ten years of revegetation in Australia have brought an increasing number of people into contact with native plant seed. Seed is of ever greater significance from the community perspective as provenance and biodiversity conservation issues and direct seeding techniques gain popularity. While all recognise the dominance of the commercial and government operators in collection and supply of seed, there are a rising group of community based seed collection and supply operations on which community based revegetation initiatives increasingly depend. Many serve mainly extension purposes and should promote and foster greater use of and demand for native seed in the community. A small number of seedbanks are established by government funding hell-bent on building sophisticated operations that are commercially viable. Whether you view this as a good or a bad thing, it is more than a fleeting phenomena.

Already partnerships are forming between community, government and commercial interests for furtherance of both our understanding and technical capacity to collect and use seed, and to encourage others to get involved. In some states it is the landcare movement that created much of the demand for native seed that currently exists.

It is a time for those in the native seed sector to embrace these partnerships for the benefits they may bring. It is a time for greater transparency in the industry and the development of industry-wide standards and codes of practice, accreditation and certification. It is time for greater effort in transferring information and the results of research in government and industry back to the wider community. In particular, we must ensure that newcomers to collecting and using native seed are welcomed and encouraged, and provided with the support they will need to continue.

Footnotes

1. There were 325 respondents to the survey questionnaire in total, of which 167 were from the community sub-sector.

2. This sector comprises all people who have an interest or involvement in native seed collection, storage or use: including native seed collectors and suppliers in commercial, government and non government organisations, responsible authorities, research and industry organisations, and experienced seed users. For convenience, this sector may be broadly divided into commercial, government and community (non-commercial/ non-government) sub-sectors. There are considerable differences between these sub-sectors nationally and among the states in regard to the scale, role, operations and practices.

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