

## Collection and Evaluation of Australian Plants

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### INTRODUCTION

**New Plants for Horticulture.** Many countries, including Australia, have beautiful native plants that have never been brought into cultivation. Australia has a particularly large range including flowering trees; shrubs—both large and small; ground cover plants; climbers; bulbs; herbaceous perennials and annuals; and potential indoor foliage and flowering pot plants, and cut flower crops. Only a relatively small, although increasing number, of these have as yet received the hobbyists' attention, much less that of nurserymen.

**Annuals and Herbaceous Perennials.** Our rich range of annuals and herbaceous perennials is even less known and collected than are the woody plants. These plants respond remarkably to cultivation. In nature, the size and persistence of many of these plants is governed by the availability of moisture. The better the season the larger and more persistent the plants. However, plants rapidly dry off and disappear when moisture runs out. In cultivation on the coast, some of these species have continued to grow and flower for a whole year.

While it is easy to dismiss many of these plants as specialized desert species, it should be noted that the popular introduced *Gaillardia* and *Eschscholzia*—which perform very colourfully—are very much desert plants in their homeland.

The first step in the collection and evaluation of Australian plants is to locate plants that may be worth collecting and evaluating. Australia is a big country containing several thousand beautiful plants with exciting horticultural potential. Floras and other books are available that cover most areas. These are very helpful in gaining a knowledge about plants and where to look. Arid area plants are generally best located on the roadside, where the best plant growth results from the minute amount of extra moisture from road runoff. Gaining access to rainforest plants generally involves rugged mountain hiking.

### COLLECTION

Serious collection of Australian plants involves many thousands of kilometers of travel. It also requires patience, perseverance, and a deep interest in native plants, not just the more flamboyant plants such as *Grevillea* or *Verticordia*, but all types from the diminutive to the large. You also need to know where and how they grow.

You need to be able to recognize plants and changes in roadside vegetation while travelling at 100 kph, to enjoy long hours of driving on quiet-roads, and to tolerate heat and dust or rain and mud. You need the patience to stop frequently and look thoroughly at plants. You need perseverance to keep searching, if necessary year after year, to relocate plants which appear only every few years.

Soils contain large numbers of seeds, accumulated over many years. A few weeks difference in the timing of rainfall can mean the appearance or non-appearance of some plants. A good knowledge of plant families is essential for successful plant

collection. Additionally, the collector needs to develop an ability to recognize horticultural potential for such uses as cut flowers or foliage, groundcover or bedding, pot or basket, or as a garden shrub or tree.

Anyone can recognize a beautiful flowering plant but it may have a great deal less horticultural potential than other far less spectacular plants that are much easier to grow or that are in flower more frequently or for much longer.

## EVALUATION

Having located interesting plants, it is then a challenge to collect propagation material and to get it home alive. It is necessary to propagate the collected plants and to evaluate them under ordinary garden conditions. Assess potential in the wild but evaluate in cultivation. Some plants, because they don't respond to cultivation, respond vegetatively but flower poorly, or attract pests and diseases, have to be discarded.

## PROPAGATION

**Seed.** Seed is usually easy material to collect—if you are there at the right time. Generally you are too early or too late. The seed of some plants, such as the outstanding eremophilas, is usually easy to collect but virtually useless because it is extremely difficult to germinate. Some species have at least three barriers to germination. Examples are a physical barrier in the form of a hard inner stone, a chemical barrier that has to leach away and a temperature barrier. Research into the germination of one species showed that seed that has lain more than 2 years in the soil would germinate only after substantial winter rain. Plants of the daisy family will often provide a few seeds from mature flower heads. *Ptilotus* and *Gomphrena* will sometimes also oblige. Hard seeds of plants such as *Crotalaria* and *Erythrina* can sometimes be salvaged by sifting the sand or gravel under mature plants. Scrapings of litter from under some plants have a good chance of yielding a few seedlings. Seeds of some plants take several years to germinate. For example, seed of the rainforest tree *Aceratium ferrugineum* have on three occasions germinated for me 4 years after planting.

Some arid-area seeds will germinate at a precise time (usually autumn), irrespective of when planted.

When you collect seed, except for most rainforest seeds, always collect into paper bags or envelopes, not plastic. Seed collected into plastic bags can be killed by high levels of CO<sub>2</sub> or mould will grow on them if there is any moist material such as undried pods, leaves, or stems present.

**Cuttings.** Cuttings can be surprisingly successful even when taken from severely drought-affected plants, provided they are prepared and packed properly. Cuttings, particularly those with sticky leaves, tend to drop all leaves after being wrapped for a few days. I generally trim the selected cuttings at the time of collection. This reduces bulk and also reduces shock to the material compared with that when the cuttings are trimmed twice. The prepared cuttings are then rolled in wet newspaper, drained of free water, and rolled in a plastic bag. Styrofoam broccoli boxes are excellent for storage and transport because they seal tightly. If cuttings are going to be on the road for over a week, it is advisable to place ice in the box. The ice should be in a watertight container so that the water cannot flood the cuttings.



Needless to say, the cuttings should be planted up promptly on arrival home. You can't expect a high percentage of success, but usually you can raise enough plants to propagate more. Herbaceous perennial species are best propagated from basal cuttings. These are the thickened basal parts of stems; discard the thinner upper portions.

**Hybridization.** I believe that the future horticultural development of our native plants must necessarily involve hybridization. So many of our beautiful plants grow only under quite specialized soil and climate conditions. One of the aims of hybridization will be to broaden the cultural base of these plants and give us more adaptable and easily grown subjects.

The benefits of such hybrids are already illustrated in the range of easily-grown *Grevillea* hybrids in which our somewhat disease resistant and adaptable coastal species *G. banksii* figures as a parent. I am referring, of course, to such cultivars as 'Robyn Gordon', 'Mason's Hybrid' [syn. 'Ned Kelly'], 'Superb', 'Pink Surprise', 'Misty Pink', 'Sylvia', 'Majestic', and several others.

Hybridization should best be attempted after a thorough study of the characteristics and cultural eccentricities of all the species in a genus, the entire gene pool, so that desirable characteristics can be deliberately combined. Nevertheless, most of the increasing range of native plant cultivars offered in the trade are accidental or spontaneous hybrids. They have resulted from the growing of several species in close proximity. The kangaroo paw hybrids are the most notable exception; they were deliberately hybridized in an attempt to achieve plants with specific qualities.

There are some very attractive hybrids in other genera, but it is intriguing to imagine how much more might be achieved after a close study of an entire genus. Hybridization using extremely difficult-to-grow species might give us fascinatingly beautiful and easy-to-grow new garden plants.

**Other Cultivars.** New garden plants with characteristics, such as variegated foliage, new vegetative forms, or new flower colours, may also arise as sports and mutations in cultivated plants. New cultivars can also be produced by growing for several generations seedlings from outstanding individual plants.

**Provenance Variations.** In many genera knowledge about all the species that comprise the gene pool is quite limited. There is even less knowledge and understanding about the extreme variation that commonly exists within many species. This variation, provenance variations, occurs between different populations of a species in different parts of its natural distribution. Often such variations are most exaggerated in extreme habitats in a plant's range such as mountain tops or headlands. These variations usually breed true from seed as for example, for naturally occurring prostrate forms of a number of otherwise erect plants. There may also be different colour forms, superior flowering forms, more adaptable and easily grown forms in some provenances. All of these can be valuable tools in the hands of a hybridist, but someone still has to locate the variant provenance, recognize the potential, propagate the plant, and evaluate the virtues or faults of the new acquisition.

**SUMMARY**

There are several essential steps in the collection and evaluation of Australian plants. These are: locating the plants; collecting suitable propagation material; successful propagation; growing plants under normal cultural conditions; and then, evaluation for hardiness, performance, pest and disease susceptibility, and any tendency to become a weed.

If a plant shows promise, further collections may be warranted for a greater comparison of individuals. Increased hardiness, more attractive form, better flowering, and different shades of colour may be achievable by collecting other provenances.