

## Propagation of a South African Arid Zone Plant — *Lithops*®

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I have decided to talk to you about *Lithops*, which are indigenous to South Africa and found mostly in dry rocky areas. *Lithops* are of the Mesembryanthemaceae family. The plants consist of a pair of thick fleshy leaves which make them very adaptable to dry and arid conditions. Flower colours of *Lithops* are mainly shades of yellow and white (Fig. 1).

South Africa has had some famous *Lithops* collectors, and one of them was Prof. Desmond T. Cole. He has written many papers and also a book titled *Lithops, Flowering Stones*. Two years ago, Mr. Frik du Plooy took over his whole collection, and he is still growing and maintaining it. Presently there are 37 known species in South Africa with over 200 subspecies and varieties. These were collected from over 700 documented locations.

The main reason for my decision to talk about this subject is that a friend of mine, Hans Blaquiere, started growing *Lithops* 2 years ago for the overseas market, and it really fascinated me. Hans bought a second-hand greenhouse and covered it with plastic and made the propagation beds, fitted a tap, and he was ready for his "retirement" project.

*Lithops* are easy to grow from seeds. They are best sown in spring and grown on through the summer and winter. Sow the seeds in a soil mix that drains well. A mixture of coarse sand and loam with coir or peat moss will do the trick.

Germination is very quick, and seeds will germinate in 5 to 6 days but growth is very slow. In nature quick germination is essential because the seeds have little time being exposed to water after rain.



Figure 1. *Lithops* in flower.

It is important that the seedlings are lightly shaded. Never expose them to direct sunlight. Although they come from arid areas, in nature *Lithops* mainly grow close to rocky outcrops, between stones and in cracks, which give just that bit of shade to protect them.

Watering is very important, and many beginners make the mistake of giving small amounts of water on a regular basis. This does not happen in nature where it is dry for a long time and then a good shower gives the plants a new burst of life. Therefore watering must be done only when the soil in which the seedlings are growing is dry. Then a good, deep soaking watering is necessary until the next time, maybe only after 3 to 4 weeks, depending on soil structure and climatic conditions.

A monthly liquid feeding with a well-balanced fertilizer will improve growth. Only use a weak solution, about 10% of normal strength.

After a year it is time to start transplanting the seedlings from the seed beds or trays into deeper trays, pots, or beds. A soil depth of about 15 cm is required. Try and keep the same soil mix recipe as this will help with your watering program.

Plant spacing in beds or trays is now about 30 mm apart, which means a density of around 1000 plants per m<sup>2</sup>.

Only give water when the soil becomes dry, and fertilise only once a month.

It takes 3 to 4 years from sowing to produce a saleable plant. Some species take longer. In Europe they require on average a plant with a minimum diameter of 25 mm. After the rains, just before winter one will notice that the plants look dry and shriveled up. No need to panic, as this is the time when new leaves are formed and the old ones are rejected and shed — just like a snake's skin. The new plants look clean and fresh again.

Commercial seeds are collected from plants grown under cover. Flowering time is usually during summer, after the first good rains have fallen. Because *Lithops* are not self-pollinators, the flowers are hand pollinated with a feather, one feather for each species so that no cross pollination occurs. In nature various insects do the job. A fertilised *Lithops* flower produces a seed capsule.

In nature the capsules stay on the plant and only open up when they get wet during rains. The tops open up and the raindrops may scatter part of the seeds around. When the capsules get dry they close up again and protect the remaining seeds until the next rain. Each capsule carries from 80 to 800 seeds depending on the taxon.

Harvesting and cleaning the seeds is relatively easy. The capsules are immersed in water and they open up. The seeds are dispersed out of the capsules and sink to the bottom. The dry matter is scooped out and the water is drained off. Seeds are dried and then stored, ready for shipment. The fact that the seeds were wet does not affect the germination at all, provided the seeds were dried quickly.

The lifespan of seeds is good, and usually fresh seeds give 85% germination. Tests have shown that *Lithops* seed lots lose about 4.5% of their germination capacity per year.

Commercially grown seeds are distributed throughout the world, mainly to collectors but also commercial growers who buy large quantities.

Frik du Plooy has a demand for about 20 million seeds per annum at present.

To sum up, *Lithops* may also be the plant to grow for your retirement, as:

- Little capital is required.
- They are easy to grow.
- You still have time to go on holiday and go fishing.

- Nothing is urgent with the cultivation of *Lithops*.
- The only time, which is crucial, is flowering time when the hand pollination has to be done, that is to say if you want to produce your own seeds.

They are marvelous little plants!

**Acknowledgements.** Thank you to Hans Blaquiére the *Lithops* plant grower and Frik du Plooy, the *Lithops* seed grower, for their assistance in preparing this talk.

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## Propagation Strategies to Support a Wide Hybridization Breeding Program Within the *Chamelaucium* Alliance®

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### INTRODUCTION

The activities of the Floriculture Group are focused on the selection and development of the West Australian flora with the object of improving industry capacity. Breeding within the *Chamelaucium* alliance is our most advanced activity, however we also work on a range of other species within genera such as *Grevillea*, *Geleznowia*, *Boronia*, *Banksia*, *Dampiera*, and a range of arid zone daisies.

Our breeding activities with the *Chamelaucium* alliance have focused on wide hybridization within a group of five related genera including *Chamelaucium* sp., *Verticordia* sp., *Actinodium* sp., *Pileanthus* sp., and *Darwinia* sp. The objective of the breeding program is to introduce novel cut flowers and amenity plants to industry. We assess hybrids on the basis of flower color, shape, and stem architecture as well as flowering time, productivity and post harvest performance. Some plants are tested for use in the flowering pot-plant section of the nursery industry and scheduling experiments are undertaken to assess nursery performance.

The Floriculture Group is in a unique position to undertake a breeding program of this type because Western Australia is the natural home of most of these plants. Plant propagation features prominently in the overall activities of the Floriculture Group. Our nursery is accredited to Nursery Industry Accreditation Scheme, Australia (NIASA) standards. The Group adopts and maintains a policy of industry best practice where possible including our plant tissue culture laboratory. Our greenhouse is a double-skinned plastic pneumatic inflated style with ridge venting and thermal screens.

In our plant tissue culture laboratory we have five laminar-flow stations and two sizable culture rooms. The lab is capable of a range of plant tissue culture activities including conventional micropropagation through to maintenance of cell culture lines for somatic hybridization experimental work. There is a strong focus on applied research and nursery integration.

The Floriculture Group also has a seed testing and grafting laboratory, which is used in conjunction with the breeding activities but also sustains stand alone research into these areas on a wide range of Western Australia plants. The Floriculture Group uses a research and development model, which includes plant selection,