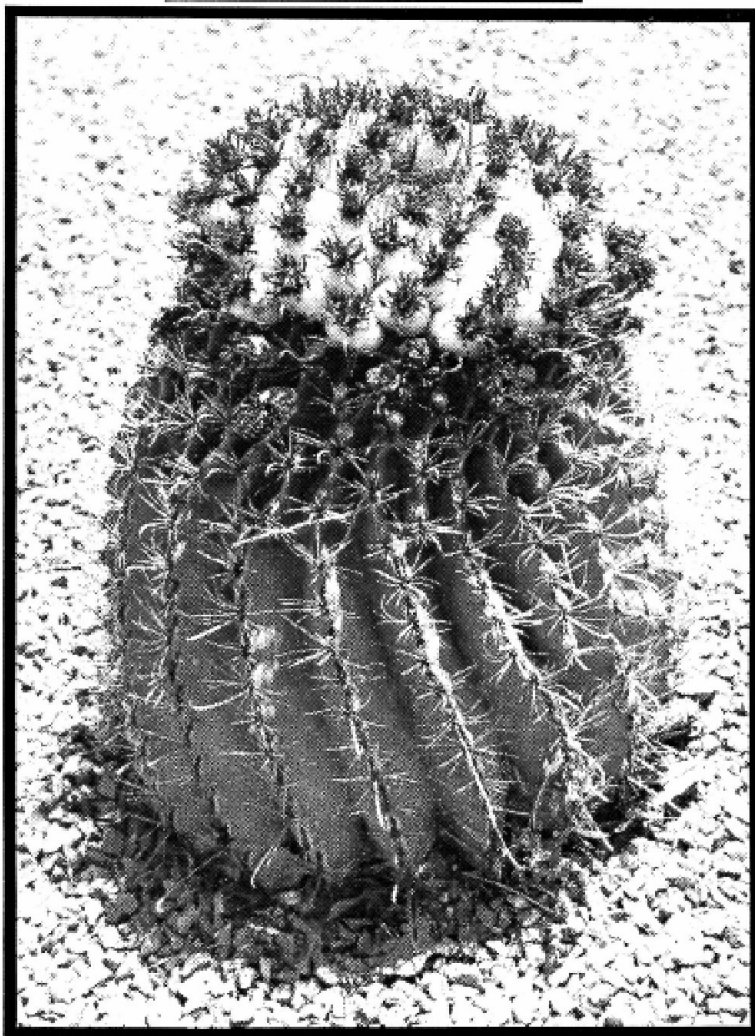


THE AMATEURS' DIGEST

CACTI - OTHER SUCCULENTS - CAUDEX PLANTS

Written and Illustrated
By Lovers of Succulent Plants

1994 SPECIAL EDITION



Seeds, anyone?

THE AMATEURS' DIGEST

1994 SPECIAL EDITION

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THE AMATEURS' DIGEST, Issn. No. 0843-9235. Publications Mail Reg. No. 8550. Published by Marina Welham, 8591 Lochside Drive, Sidney, BC V8L 1M5, Canada. Tel (604) 655-1216.
Postmaster: Send address changes to above address.

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Ferrocactus acanthodes-See also Page 55

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Sincere thanks to all the dedicated hobbyists who contributed information and illustrations for this special edition so that other collectors might share their enjoyment of our hobby. We invite and welcome comments from all lovers of succulent plants on the contents of this issue so that the information sharing process can continue into future Digest issues.

1994 Special Edition: USA and Canada \$4.00
Others \$5.00

Overseas add \$2.00 for Air Mail

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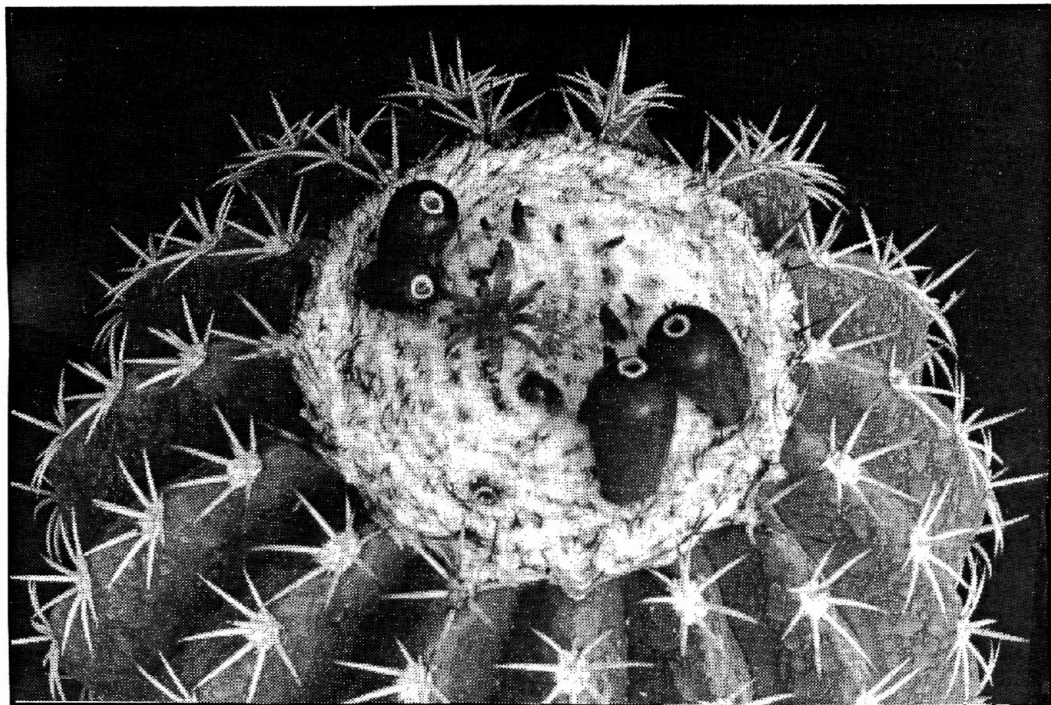
We invite you to join our membership. Please see Page 58 for subscription information.

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Bract	A leaf-like or scale-like organ extending under a flower	<i>Adansonia digitata</i>	12
		<i>Aechmea fasciata</i>	39
Cartilagenous	Firm and tough	<i>Aloe polyphylla</i>	33,34,36
		<i>Aloe suprafoliata</i>	15
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		<i>Euphorbia abdelkuri</i>	24
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Scape	A leafless main flower stalk arising from the underground parts of the plant such as in <i>Agave</i>	<i>Euphorbia virosa</i>	5
		<i>Faucaria tigrina</i>	49
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		<i>Glottiphyllum arrectum</i>	49
Tripartite	Divided into three parts	<i>Gymnocalycium mihanovichii</i>	30
		<i>Hechtia marnieri-lapostollei</i>	42
Truncate	Square at the tip, as if cut off	<i>Hylocereus</i>	30
		<i>Juttadinteria elizae</i>	50
Tubercle	A small, more or less conical protuberance (bulge or swelling)	<i>Lophophora williamsii</i>	06
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Xerophytic	Relating to xerophytes. Xerophytes are plants adapted to live on a limited water supply.	<i>Melocactus glaucesens</i>	4
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Producing a few seeds

From Your Own Collection

Doug Rowland



Melocactus glaucescens showing pink (wet) berries -Plant & Photo: John Munro-Cape, Picton, Ontario
 "Pink flowers by the hundred. Eventually dozens of seed berries push through cephalium taking a day to develop."

Some cacti form fruit with viable seeds by means of self-pollination. Two of the best examples of plants producing seeds themselves are found in the genera *Mammillaria* or *Rebutia*.

Others do not set seed themselves and to fruit successfully must be pollinated. To be successful you need to have two plants of the same species which will flower at the same time. It is very important to choose the correct time for this procedure. The flowers must be open and releasing pollen. Midday, or in the case of nocturnal flowers, early evening, is an excellent time to arm yourself with a small, soft camel hair brush. Remove a little pollen from the style of one flower and carefully deposit it on the stigma of a flower of another similar plant. The flower will die and a seed berry will begin to grow. In some genera the seed berry forms inside the plant body as in *Mammillaria* or on the base of the globular stem as in *Rebutia*.

Because there is a distinct lack of pollinating agents in a greenhouse, it is necessary

Seeds From Your Own Collection

for you to do the hand work of pollinating with a soft brush.

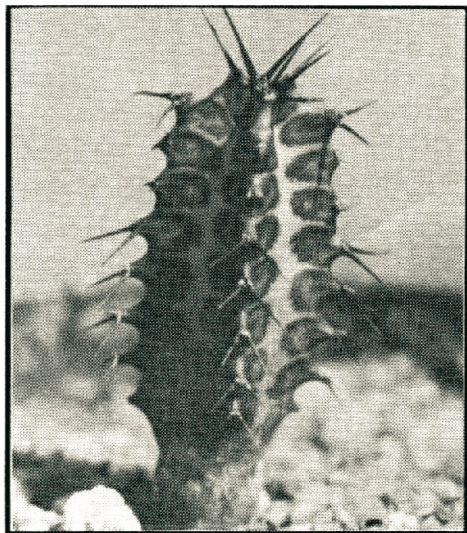
Allow the seed berries to fully ripen, then they begin to shrivel and dehisce. Carefully collect the dry seeds as in *Rebutia*, *Turbincarpus*, *Strombocactus* and *Echinocereus*. Place in a dry, clean paper packet and store in a cool place until the following spring.

If you leave *Rebutia* berries on the plant, eventually they will dry out releasing the seeds which will fall into the pot and germinate around the mother plant.



Piaranthus punctatus - 2 years from seed - "small to medium flowers variously colored and spotted."

Plant & Photo: Russ Kersey, West Lawn, PA.



Euphorbia virosa

Just 22 months from seed Al says height is now 2.5cm. Plant & Photo: Al Henderson

Euphorbia capsules present special problems because when ripe they explode and eject seed in all directions, often germinating new plants in the pots of other plants in your collection. *Euphorbia obesa*, for example, has exploding tripartite, dry capsules.

Secure white paper caps temporarily to the plants and seeds, when ejected, will be prevented from travelling away.

In *Euphorbia* many species produce wholly male or wholly female plants. In these cases you will need a plant of each to successfully produce seeds.

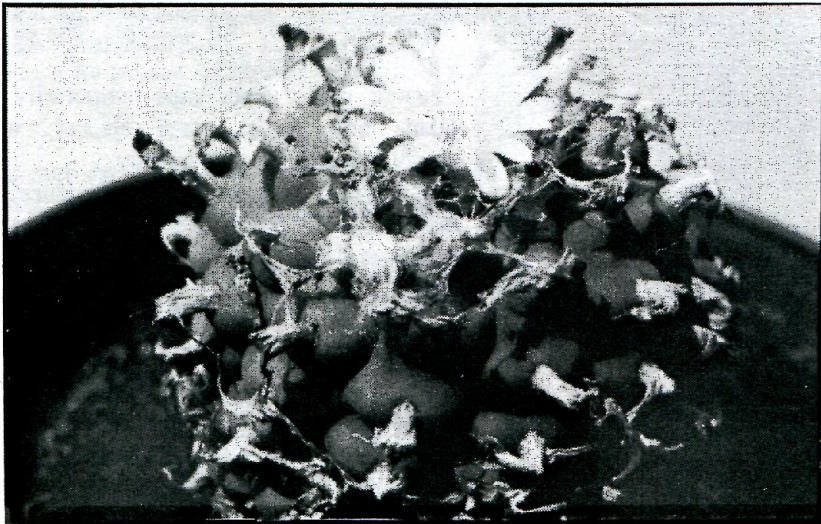
In *Euphorbia obesa* the pollen takes easily and two crops of seeds can be obtained in one season. In *E. obesa* there is no sure way of sexing a plant until it is in flower. Some flowers remain closed for the length of their life such as my *Poellnitzia rubriflora* (classified as *Haworthia*).

Seeds From Your Own Collection

Some of the *Asclepiads* are difficult to pollinate but occasionally blowflies can and will do the job for you. Large, brown, evil smelling *Stapelia* flowers blooming in a greenhouse or conservatory in summer will soon attract a host of house flies and blue flies which often lay their eggs near the center of the flower area. Sometimes the eggs will hatch and come to nothing but often the important work of pollination has been done.

Green pointed seed horns, reminiscent of another genus, *Pachypodium*, will soon appear and grow on. Eventually the skins will dry and dehisce revealing hosts of seeds fixed to woolly 'parachutes'. You will now have to collect these quickly or the seeds will become windborne and lost. Take the seeds indoors to a calm and clean area and detach the parachutes from the seeds. The parachutes are thrown out of course and the seeds packed into a clean paper envelope or stamp packet and stored in a cool, dry place until sowings begin early the next year. You will read in many books that *Asclepiad* seeds have a very short viability. Do not believe it. If stored properly they will last for quite some time and then they will shrivel and dry up and be of no further use. Plump, good quality seeds should germinate quickly, sometimes in two days from sowing. Water well at the time of sowing with a fungal mix.

Wet berries of the Cactaceae need a different treatment. When ripe, remove them carefully, slit edgeways with a sharp knife, scrape the seeds and pulp into a little clean water and stir briskly to get the juice to dissolve into the water. Strain through a coffee filter paper and allow to dry. Carefully remove from the filter paper, place in a clean paper packet and store in a cool place until the following spring. We have to produce *Lophophora williamsii* seeds this way because they are not available in quantity commercially. Each berry produces very few seeds so in order to obtain a thousand seeds, it is a long and painstaking job.



Lophophora williamsii - Flower light pink-rarely white or yellow. Photo:Istvan Gonda

Seeds From Your Own Collection

Mesembryanthemaceae are interestingly quite different. Their seeds are eventually produced in dry capsules with ingeniously designed lids which open when a spot of rain falls on them. You can crush and crumble the seeds out but in doing so you may crush the seeds themselves and the debris can cause fungal growths to form when the seeds are sown.

To cleanly and correctly remove seeds from these capsules you will need a cup or small carton of clean water and a pointed stick made from a 3mm hardwood dowel.

Place the capsules upside down in the water and after a few minutes they will open. Hold the base with one hand between the finger and thumb and, dunking, carefully root out the seeds from each partition with the pointed stick.

We have on occasion found 3000 seeds in a single *Dinteranthus* capsule.

In *Lithops* both seeds and capsules vary in size and on average a capsule will contain about 300 seeds, although some will produce considerably more, some much less. Allow to dry out and packet as before.

Occasionally capsules of *Lithops* or *Dinteranthus* are available from African nurseries.

Germination of seeds of *Mesembryanthemaceae*, including *Lithops*, can take four days to about one year. They will germinate at temperatures from 50°F and up when day length and temperature is suitable for that particular species. In the main they are easy to germinate in greenhouse conditions. The seeds are comparatively small and will often come up in successive 'waves' after periods of time when light, day length and all other conditions are suitable. Give seedlings plenty of light and do not cover after germination. Winter and short day growers are best sown in autumn, the rest in spring. A 40°F minimum temperature in winter with plenty of light is very congenial to adult plants. These are excellent plants for beginners to try. A hundred seeds sown in a 2½" pot will give pleasing results and encouragement for you to try something a little more difficult and challenging. Do not discard pots of ungerminated seeds. Dry them off and try again next growing season.

Tips and Tidbits

If a green algae begins to appear on the soil surface amongst your seedlings, sprinkle a small spoonful of bird grit on the soil (available at pet shops). This excludes light and resolves the problem of algae.

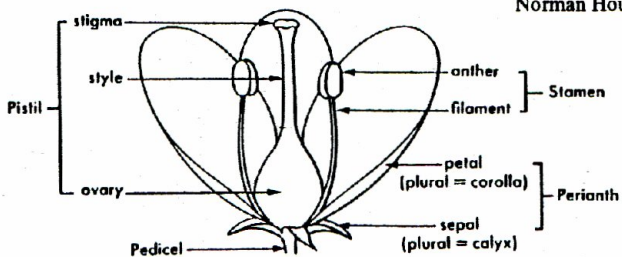
Succulent seeds with hard coats may have to be chipped or filed to induce the seed to take in water, which they must do to germinate. *Adansonia* and *Bombax* fall into this group.

High altitude and cold climate cactus seeds will often germinate better if subjected to not less than one month of artificial wintering in a domestic refrigerator. Then attempt to germinate in the normal way. *Tephrocactus* will be in this category along with *Eriosyce* and some *Echinomastus*.

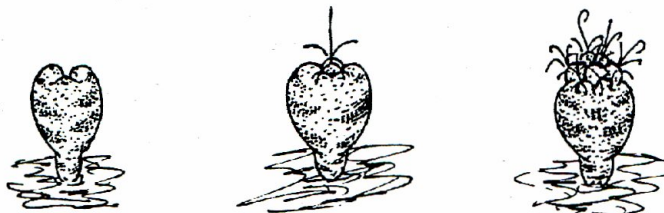
Many succulent plant collectors also grow Carnivorous Plants. To raise these from seeds fill a pot to within half an inch of the top with a mix of white sand and peat moss in equal parts. Stand permanently in half an inch of rainwater. Sow seeds on the surface and allow up to two years to germinate.

Seeds From Your Own Collection

Seedling Drawings By
Norman Houston of Belfast



General Flower Parts

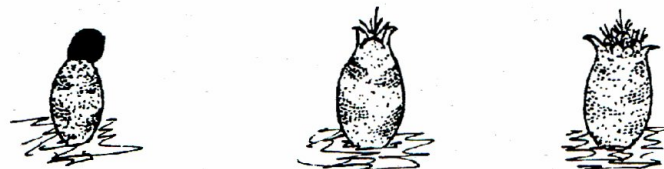


One Week

One Month

Two Months

Mammillaria Seedlings

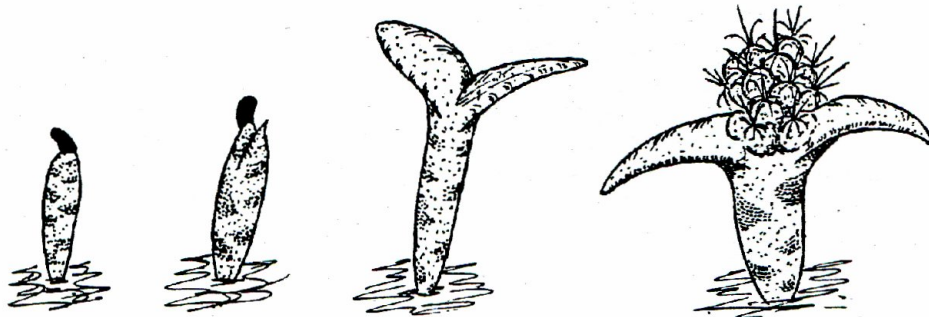


One Week

One Month

Two Months

Rebutia Seedlings



One Week

Two Weeks

One Month

Two Months

Typical Cactus Seedlings

How Do Succulent Seeds Sprout ??

Harry Evans, Victoria, BC

Let's talk about seed structure. Each seed has a seed coat which moisture has to penetrate before the seed will sprout. As seed coats differ in thickness and *strength*, moisture takes different periods of time to penetrate the seed coat. Some seeds will therefore germinate in three to four days. Others may take three to four weeks or longer. Germination of thicker seeds can be aided by a process called 'scarification' which simply means abrasing the seed coat.

Seeds vary greatly in size from dust-like particles to much larger and each seed contains a food supply in the form we refer to as food leaves. It is these stored foods which we eat in grains, nuts, beans, peas, etc. As the plant's mature leaves form, they start to manufacture their own food. At this time the original food leaves shrivel and are of no more use. There are exceptions to all rules, however. Some seeds which do not have food leaves such as orchids, compensate for this by producing great quantities of seeds.

Each seed contains an embryo plant and when germination starts the seed coat splits, a rootlet starts to grow down into the soil mix and a sprout, carrying food leaves, starts upward. The seed has a sense of the force of gravity at this time. (See note on gravity later on).

In order for seeds to sprout, there are four important factors to consider:

1. Proper depth of planting
2. Water
3. Air
4. Temperature

Proper Depth of Planting

I would say most failures in sowing seeds occur by burying them too deep. A good rule is to sow your seeds to a depth of two to four times the diameter of the seeds. Small, dust-like seeds are scattered on top of the soil and gently firmed down to make good contact with the soil.

Water

After you have planted your seeds, water the flat well from the bottom and *never* allow the soil to dry out during the germination period. As germination occurs, the seed

How Do Succulent Seeds Sprout?

coat splits, and a rootlet occurs which will then start downward and the sprout carrying the food leaves will start towards the surface of the soil, responding to gravity.

Air

Keep in mind air has to penetrate the soil so do not compress the soil too hard but just enough so the seed coats make good contact with the soil.

Temperature

The preferred temperature for seed germination is 70°F day and night. There are exceptions and the instructions on the seed packet are a great help. Heating cables with a built-in thermostat set at 71°F are carried by most garden centers. ☆

Doug Rowland says ...

"The point about gravity (mentioned in the foregoing article) is that when you germinate any seeds, the stem goes up and the root goes down according to the earth's gravitational pull. If you germinate seeds, say in a wet moss peat in a jar or plastic bag and then rotate the bag continuously, the seed becomes confused and cannot identify the earth's gravitational pull and will send sprouts and roots in all directions! "

Ceropegia sandersonii

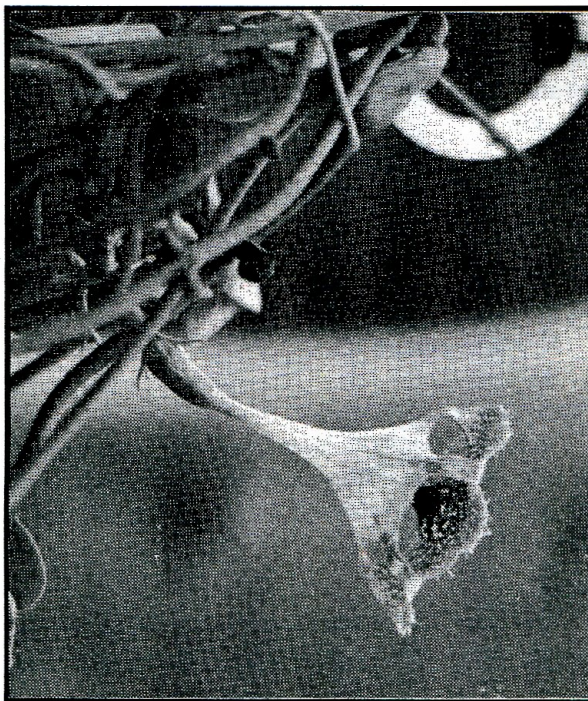
Photo:

Bob Harris, St. Louis, MO

Picture was taken at the Henry Shaw
Cactus Society Show
in 1992

Plant owner is
shown as Joan S.

Flower is pale green and cream
color. Stem light green.



How To Multiply Your Succulents

Bob Stone, Bradenton, Florida

From Seed

Seeds should be sown on sterile medium. Soilless mixes, such as Pro-Mix or Ball Mix or other peat/perlite mix are suitable. A blend of good garden loam with coarse sand, about half and half, is also good. If garden soil is used, it should be sterilized by moistening it and heating to about 150 degrees for half an hour.



An exceptional collection (& photo) of Robert Herbage, Don Mills, Ontario-Many of the beautiful plants in this selection will flower providing seeds for new seedlings. Pups on some can be removed to root new plants.

Fill a suitable container to a depth of about two inches with the soil mix. Add a thin layer (about ¼") of coarse sand. Drench soil by immersing container in a fungicide solution just deep enough to completely soak the soil, then drain. Insert seeds about their

How To Multiply Your Succulents

own diameter into the sand. Fine seeds may be sprinkled onto the surface, then be watered in between the sand granules by gentle misting.

Enclose entire container in a plastic bag and fasten bag closed. Place in good light, but not full sun. Use bottom heat of 70 to 80 degrees, if available. A good source of heat is the top surface of a fluorescent fixture, near the ballast, where the heat can be felt. After germination, place container in brighter light. If placed in full sun, the temperature inside of the bag will get too high and damage the seedlings. Some succulent seeds will germinate in 48 hours or less. Others (usually ones with a hard shell) may take as long as a year. These are usually the rarer seeds. The average grower is not likely to have the problem.

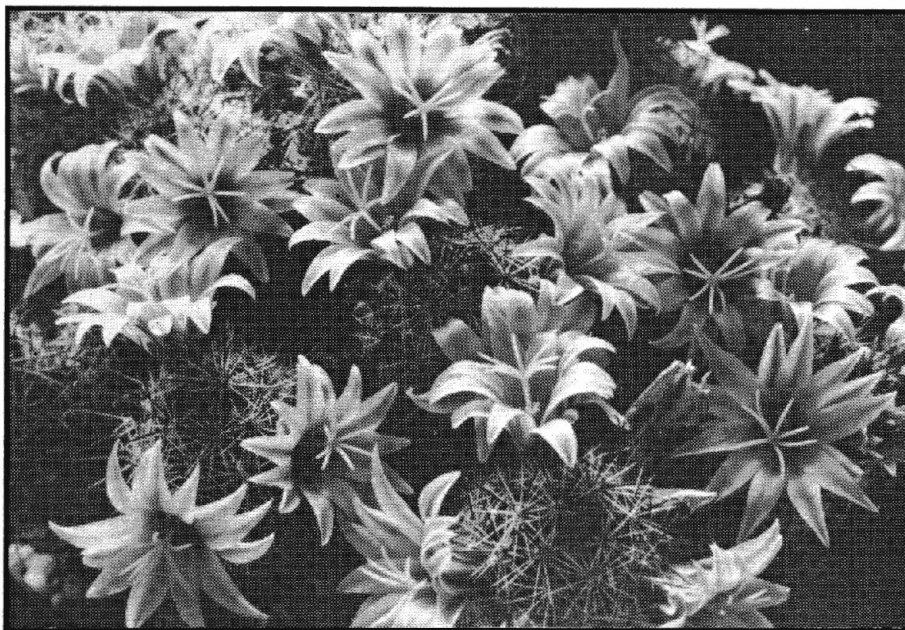


All From Seed. "Left to Right-*Adansonia digitata* 15 mths. 19" tall. *Gasteria* sp. *Euphorbia balsamifera* 14 mths. 10" tall. *Pachypodium rutenbergianum* 8 mths 4 1/2" tall. *Adansonia digitata* 9 mths 17" tall. (I suspect the latter is not *digitata*. Note the leaf margins." Plants & Photo: Al Henderson

Seedlings, especially cacti, can remain in the closed bags for many months, generally without additional water. Some succulent seedlings might be subject to rot if left too long. When succulents show their first true leaves, or when cacti show spines, they may be fed with a weak solution of a balanced plant food.

When transplanting seedlings, insert them into moist soil and do not over water. This gives the roots a chance to heal. As seedlings mature, move them closer to the fluorescent tubes, or into brighter sunlight. Keep soil evenly moist, but not soaking wet.

How To Multiply Your Succulents



Mammillaria mazatlanensis-pale pink flowers with deep pink stripe
Plant & Photo: Olda Lastovicka, New Zealand

Vegetative Propagation

1. Offsets

Some species develop offsets or 'pups' as they mature. These afford the simplest means of propagation. In cacti, the offsets appear either at ground level or higher on the body of the plant. These are carefully cut off at join between plant and offset. The offset is then allowed to dry (callous over) and it is then set on top of soil. Keep soil moist (not soaking wet) and eventually roots will form and enter the soil looking for moisture. Low-growing plants sometimes form clusters which can be separated and planted singly. In many cases roots will already be formed on the offsets from the parent plant. Insert into moist soil and set in a bright, warm location. Since the offsets are really small plants and have no cut surface, they are not very subject to rot. Bottom heat may aid in getting them well established.

2. Leaf Propagation

Most plants with succulent leaves such as *Sedum*, *Echeveria*, *Crassula* and others will make new growth from the base of a leaf laid on the surface of moist soil. Gently break the leaf from the stem. Do not cut it off. In many cases the new growth develops

How To Multiply Your Succulents

from the portion of the leaf that was attached to the stem, and cutting would remove this growth tissue and result in failure.

Some species, *Kalanchoe* among them, will grow new plants at the leaf notches if a leaf is pinned down in contact with the soil. Some *Kalanchoes* actually develop new plantlets at the leaf notches during normal growth. These fall off, or can be removed and planted. They provide very nearly 100% successful propagation.

3. Stem Cuttings

A) Other Succulents

Each stem cutting should include at least two leaf-nodes, more if possible. Remove leaves from lowest one or two nodes. Save some of the leaves and try leaf-propagation. Dip cut in powdered sulfur, powdered charcoal, or a rooting hormone. The first two have antiseptic properties and the rooting hormone will make *you* feel better, whether it helps the plants or not. Some of the juicier cuttings should be dried for a day or two so the cut end will heal and protect against rot. Fungicide in the soil will help too.

Various growers with much experience recommend a number of rooting media. Some are: perlite, vermiculite, soil, sand, peat/perlite, or a combination. Whatever you decide to use, it should be moist and should not be allowed to dry out. Insert cuttings far enough to cover the places where the leaves were removed. In order to keep the soil moist and the humidity high, the container can be enclosed in a plastic bag or if there is enough depth to the container, a piece of glass or sheet-plastic can be laid over the top. Bright light and bottom heat will speed root development.

B) Cacti

These plants are like no others in their requirements. Most species, but not all, can be propagated from cuttings. They are very susceptible to rot but a few precautions will ensure good results.

All cuts should be dusted with powdered sulfur or powdered charcoal to prevent infection, then should be allowed to dry and form a callous. The callous will seal out the elements in the soil that can cause rot. If making more than one cut from a long stem, be sure to mark which end is up. If cuttings are placed in a vertical position and set aside, they will eventually sprout roots, without soil or water. I prefer to set the short, fat cuttings on top of a dry rooting medium and check from time to time for root growth. When roots have developed, the soil may be watered, but not too much at first.

For tall, thin cuttings I have found that a convenient method is to put a couple of inches of rooting medium into a flower pot or similar container, then stand the cuttings up on the surface. No water until roots start to form.

Opuntias can be done differently. These are the cacti with (usually) round, flat pads forming stems and branches. The easiest way for them to be rooted is to remove a pad and lay it flat on a shelf or on top of dry soil or sand. Large pads can be cut into

How To Multiply Your Succulents

convenient pieces and be set out the same way. Roots will grow from the lower surface and new pads will develop from the edges or upper surface. Once roots have formed the pads or pieces can be potted up and watered.

Growing On

Once your cacti and other succulents are potted up and growing they need very little attention compared to ordinary house plants. Most prefer bright light. Most cacti will tolerate full sun but if they have been in the shade or under lights they must be adapted to bright sun in stages to prevent sunburn which could be damaging or even fatal.

As for watering, there can be no hard and fast rule. The frequency of watering will depend on many factors. You must consider whether your soil mix is fast or slow draining, whether the pot is plastic or clay or glazed pottery. Clay pots dry out much faster than the other two. The amount of heat and light will also affect water consumption. A general rule is to drench the soil thoroughly, empty the pot saucer, if any, then wait until the soil is quite dry before watering again.

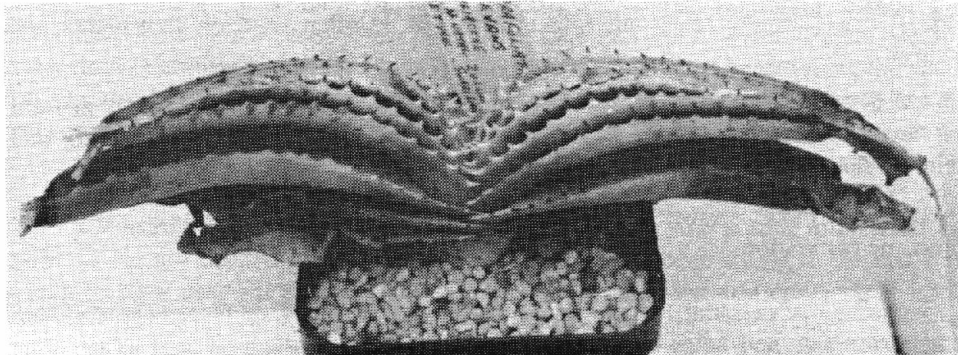
How About Feeding?

I grow my plants 'hard' which means a minimum of water and food. I think I have lost more plants to over-watering than to under-watering. I use time-release plant food, Osmocote 14-14-14, but there are other fertilizers that are just as good. Most cacti grow in our spring and summer months and rest in fall and winter. They do not need food while resting.

Do They Really Bloom?

Almost all cacti and other succulents bloom in habitat but some of them are difficult in cultivation. All cacti and most other succulents bloom better if allowed to go completely dormant in the winter. I keep my greenhouse at 45 to 50°F in winter and the plants get little or no water from October or November until February or March. This gives them a good dormant period and most of them reward me with many beautiful flowers. With a little luck, yours will do the same for you.

Good growing! ☆



Aloe suprafoliata Pole Evans - Plant & Photo: Robert Stephenson, Cobourg, Vic., Australia

All Plants Need Food

Marina Welham

Fertilizers are the major part of a plant's diet and form the building blocks for growth. Most plants need three major nutrients which are identified on the product you buy by three numbers. For example, when you see on the label 20-20-20 or 15-10-15, the first number always indicates the **Nitrogen** content. The second number indicates the **Phosphate** content and the third number tells you the **Potassium** content.

Major Nutrients

N Nitrogen: Necessary for green growth and foliage production. It is important to remember that feeding too much nitrogen to succulents (cacti in particular) will cause the plants to become weak and flabby. In this condition they are then susceptible to pests and diseases and also makes them more susceptible to rot. Lack of enough Nitrogen can also cause problems. If a plant which is normally bright green suddenly goes pale, lack of nitrogen is often the reason.

P Phosphate: Helps promote growth of roots and stems and helps nitrogen and other nutrients to be used by the plant to best advantage. Phosphate also helps flower production if applied at the right time in the growth cycle.

K Potassium: Helps to increase the resistance of plants to disease and insects. Is also necessary to enable plants to use water efficiently and is very important for the production of flowers. It even encourages seeds to germinate and cuttings to root more readily. With all this going for it, Potassium might be considered the most valuable of the three major nutrients.

20-20-20 is a complete multi-purpose plant food, perfect for encouraging general plant growth.

10-52-10 helps develop a strong root system and is often used on transplants and seedlings.

15-30-15 increases blooming on flowering plants. Extra phosphate **applied only around the time the plant normally is expected to bloom** will encourage blooming and maximum flower production.

10-6-16 feeds plants grown in hydroponic systems and should be used only with hydroponic cultivation.

Intermediate Nutrients

Magnesium is essential for photosynthesis and efficient use of Phosphate. Calcium strengthens plants and helps make them more resistant to disease as well as enabling them to use Nitrate and Phosphate more efficiently. Sulphur is a vital ingredient of plant

All Plants Need Food

enzymes and proteins. Some fertilizer brands omit these nutrients altogether. Obviously you should choose brands which include them if you want to use a complete fertilizer.

Trace Elements

Plants also need many other elements for healthy growth but they are needed in much smaller quantities. These trace elements (or micro-nutrients) include iron, manganese, zinc, copper, boron and molybdenum. We usually refer to them as 'trace' elements because so little is required in proportion to the major nutrients. When choosing a fertilizer, therefore, it's always wise to make sure the label tells you that in addition to the correct N-P-K ingredients, the product also includes trace elements. Iron and Manganese are both necessary for photosynthesis and for making chlorophyll.

Water Soluble versus Solid Fertilizer Products

Plant roots cannot take in nutrients unless they are dissolved in water. Water soluble fertilizer products dissolve completely and provide the fastest and most effective method of feeding plants. Water soluble fertilizers are in the long run more economical too because so little is required to make all the nutrients immediately available and you can easily regulate how much to mix whether you are watering a large collection or just spot feeding a few plants.

Most soil mixes are alkaline (low acid). An alkaline soil inhibits the uptake of fertilizer elements. That is why most complete fertilizer products produce a slightly acidic condition which enables the plants to easily absorb and utilize nutrients. If your soil is very alkaline, this condition must be corrected otherwise you are feeding your plants and they are not taking in the nutrients. Alkalinity or acidity of the soil is expressed as the pH value of the soil. The only way you will know the pH value of your potting mix is if you invest in a good pH meter and use it periodically through the year to test whether or not your soil is in condition to satisfactorily use the fertilizers you apply through the growing season. If the indicator on the pH meter shows a pH of 1 to 7 your soil is acid. The No. 7 means it's neutral. And more than 7.3 is alkaline. With some exceptions succulents grow best in a slightly acid soil where the pH number is between 4.5 to 6.5. If your soil is very alkaline it is important to correct the pH value by making the soil more acidic. This can be done by adding acidifying agents. An inexpensive method is to steep a few handfuls of peat in a pail of water. Tie the peat in a cheesecloth or similar bag so that you don't have to sift out debris before using the water. You can also buy citric acid at the drug store and add it to your water. But use of a pH meter is really a must if you use citric acid because you should control how much you add so as not to over-acidify.

Compost

If you have a good garden compost available for use in your potting mix, additional fertilizers are not needed until such time as the plant has been sitting in the mix long enough to have used up the nutrients in the compost and then you either repot into a fresh mix (including compost) or begin a schedule of additional fertilization. Certainly

All Plants Need Food

no added fertilizers should be needed during the first year after a plant is potted into a potting mix in which a good compost is used. An excellent article on composting in this issue by Vida Cairns will tell you how to make your own compost. There are many small low-cost composting units on the market today which take up little space. Since the proportion of compost to the rest of your mix is quite small, a little will go a long way.

Over-feeding

If you fertilize too much you create more problems than you would if you starve your plants. Succulents will not become lush (only mush) with over-feeding. Many hobbyists like to feed their plants with every watering during the growing season using a much weaker fertilizer-to-water mix than recommended by the manufacturer. Their theory is the plants are much happier with a regular, balanced feeding than having a strong shot of fertilizer once or twice during the growing season.

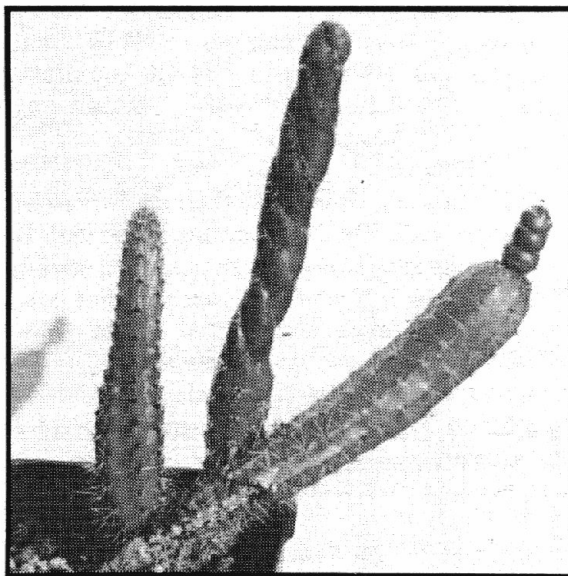
Some plants naturally grow very slowly in comparison to others. Giving them an extra shot of fertilizer will not accelerate their growth. In fact you may be encouraging the plant to grow horribly out of shape and probably, in the end, it will die. ☆

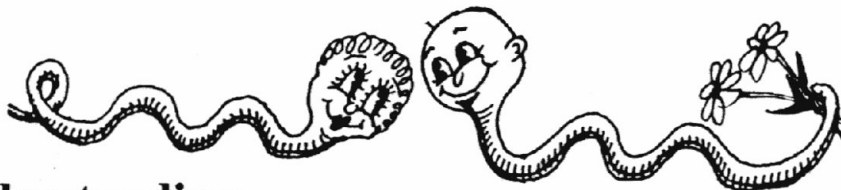
Weird ???

Plant & Photo: Alice Tabor
Marlborough, New Zealand

Erdisia (Corryocactus)

Have a close look at the plant in this photo. Notice two normal stems, one that is twisted into a spiral and another twisted shoot growing out of one normal stem. Alice Tabor says the one normal stem (without the shoot) has continued to grow. She wonders what she should do. Cut the twist off? Give the plant free root run or will that cause it to grow too fast and lose the twist? Keep us posted on what you decide, Alice, and let us know what happens.





Understanding COMPOSTING

Vida Cairns, Olympia, WA. on Leafmold

I'm sure 80% of hobbyists don't know that Leafmold is another word for Compost which is Nature's way of providing food and soil builders for plants in the wild. It is made up of fallen leaves that lie at the base of trees and bushes. Having spent the winter on the wet ground it rots and becomes shredded. By spring you will find that most of the fallen leaves seem to disappear. A depth of 6" of fallen leaves will reduce, rot or 'compost' to approximately 1" of leafmold. By scraping the soil under a tree where leaves were not raked up in the fall, and sifting the residue through a ½" screen, you will have a sort of leafmold. Be sure to sterilize this mix (more about that later) or add a soil insecticide such as Diazinon because it will be full of wire worms, sow bugs, centipedes and any number of soil diseases. Allow the insecticide at least 24 hours to kill all the insects. Diazinon does not kill earthworms and they are soil enrichers, as any worm farmer can tell you. When you allow the soil to go dry, the earthworms will die also so there is little fear of the soil becoming "too rich" for cacti and other succulents.

We have supplied our nursery needs for the last eight years by making our own leafmold. We need about 600 gallons per year. Each fall we collect fallen leaves from our native big leaf maple trees. We dump and pack our maple leaves into a large chicken-wire bin. As layers are added, they are sprayed with water to get them wet and keep them wet. By spring they are well on their way to being leaf mold. When they are well rotted, that is broken down or composted enough to be screened, screening is done. Then we mix the leafmold with Diazinon granules and put it into 55 gallon drums to kill insects and be stored awaiting use. These drums have drain holes punched in the bottom for drainage and are left open-topped so that rain will keep them moist.

Our soil mix is ½ leafmold and ½ coarse, sharp sand which comes from a 'rock crusher' as opposed to screened river sand. River sand is more rounded and smoothed whereas crushed rock is sharp edged from being recently broken. To 5 gallons of this mix we add 2 tablespoons of 14-14-14 Osmocote fertilizer. With this mix we do not have to fertilize again. If the plant outgrows its pot, it is merely set into a larger pot, root ball intact, with fresh soil around the sides and bottom to supply the plant for another year or more.

Understanding Composting

This mix is good for our damp climate as it dries out easily and is very easy to wet in the spring after our dry winter rest. If you live in a drier climate than we do, you would need to water more often, or amend the mix with clay soil or peat moss to hold moisture longer.

As a hobbyist of course you would not need to do all this on our large scale! You can use a compost bin of smaller size or even an old garbage can. Be sure there are drain holes at the bottom. Leave the lid off and keep the leaves damp so they will rot. If you regularly mix them up, they will rot faster and the mixture will be more even, but I personally do not consider that extra work worthy of my time and back muscles.

If you are opposed to insecticides, then take the *damp*, sifted leafmold and bake it in a covered pan until the temperature reaches 180°F. Keep it at that temperature for 30 minutes which pasteurizes it. It is ready to use when cool.

Collect leaves that are free of harmful sprays and hopefully of disease. Thinner leaves such as maple, willow, etc. will break down faster than oak as there is less woody fiber. In southern California most of the leafmold is made from the native live-oak trees, but then it has to be aged longer. If you already have a compost of vegetable scraps, etc., that is of the same nature, it can be used but it will probably be 'hotter', richer in Nitrogen and you will therefore need to use less in your soil mix.

Happy leafmolding. And don't burn those fallen leaves! ☆

Tips for Quicker Compost - Marina Welham

To speed decomposition, materials should be *reduced in size* to create more surface area on which the bacteria may act. Skins should be bruised or crushed to provide for entry of the micro-organisms that bring about decomposition. For example, tear and mar the skins of fruits and vegetables, cut up banana skins into several pieces, slice grapefruit peelings into small pieces, chop up carrot and other vegetable greens, split tea bags, crush egg shells, tear up stale bread, etc. etc. You can add Bar B Q and fireplace ashes but make sure they are dead and cool with no chance of igniting. Chop up small twigs, hedge trimmings, tomato vines and old plants and then shred them finer by running over them with a power lawn mower. A huge pile of leaves will reduce to a fraction after shredding and will decompose rapidly. Woody materials take longer to break down. Watering these thoroughly will help.

Micro-organisms require water for reproduction and decomposition. The material in your composter must therefore remain moist and should be as damp as a well squeezed-out sponge. Check the moisture content frequently.

Mix and vary materials thoroughly in order to prevent thick layers of any one material which will mat together and compact into a soggy mess. Kitchen wastes are well mixed normally and may be added on a daily basis for convenience. They should, however, be covered over with grass cuttings, leaves or soil to prevent flies. Never add scraps of meat, bones or fat to compost.

Understanding Composting

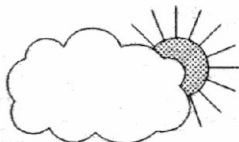
In the fall, mix leaves and grass cuttings together (with a garden fork if there is a lot). If the leaves or any other materials are dry, water them thoroughly.

Micro-organisms require a balanced diet of carbon as an energy source and nitrogen as protein to make the micro-organisms reproduce. Generally fresh and green materials added to the compost such as grass cuttings and weeds are high in nitrogen. Older, tougher materials such as dead leaves are high in carbon. To have a correct balance, mix one part of grass clippings with an equal part of dead leaves.

If there is an excess of carbon (leaves) extra nitrogen may be added to activate the compost. The best organic activators are animal manures, dried blood, real bone meal. Or you can buy commercial activators which are high in nitrogen but chemically prepared. These chemical preparations are not essential, however, if you use the proper mix of elements as described. And commercial additives are expensive.

How to Tell When Compost is Ready To Use

Compost can be ready in four to six weeks. It will have the appearance of dark brown loam which balls together and is crumbly, moist and has a pleasant earthy aroma.



Winter Composting?

You cannot compost in winter but you can save kitchen waste through the winter for composting in spring. Place whatever container you choose for composting near your kitchen door. Put about a foot of fall leaves in the bottom and moisten to pack down. Start adding kitchen waste after the first frost but do not mix it with the leaves at this stage. During the winter the kitchen waste will freeze and there will be no smell. When the warm days of spring arrive the material will thaw out. Then you should thoroughly mix the leaves and kitchen waste together. If you do notice an odor, that means the mix needs more oxygen. Turn the pile of compost with a fork or spade. This action will also help dry the pile if it is too wet which is often the cause of the odors.

Materials you can use for winter composting are: all fruit and vegetable trimmings, peels, etc. (chopped and shredded). Tea bags (split), egg shells (crushed), stale bread (broken into pieces), cold fireplace ashes, remains of dead flowers from the garden, etc. Bones, meat, fat or cooked left-overs should never be added to a compost pile.

With the advent of the new, small composters available at moderate cost (some as low as \$25.00), lack of space is no longer a hindrance to 'raising' your own compost to feed your plants. In the long run the money spent on the composter will be saved many times over when you no longer need to pay the high cost for chemical fertilizers. ☆

Grafting and . . .

The 'Other' Succulents

Doug Rowland, England

For many years it has been fairly commonplace in our hobby to graft difficult and slower growing species of the family *Cactaceae* on to *Pereskopsis* stocks at the seedling stage, or as offsets or larger seedlings on to *Cereus* or *Trichocereus* stocks. This makes for easier cultivation, quicker growth and an improved method of propagation of these rarer kinds of plants.

Because some of the more difficult 'other succulents' have been coming into cultivation, it is wise and even expedient to graft these too.

There are at present four plant families where grafting can be a distinct advantage. These are *Apocynaceae*, *Asclepiadaceae*, *Euphorbiaceae* and *Portulacaceae*.

APOCYNACEAE

Seeds of most of the species are now generally available in commerce. However, *P. brevicaule*, *P. namaquanum* and *P. decaryi* are slow and difficult in lesser climes than their habitat. At the seedlings stage, these species may be grafted on to the growing tips of *P. lamerei*. This is best done in late spring when growth has begun both in the stock and the scion. The plants will then be as easy to grow as the host stock.



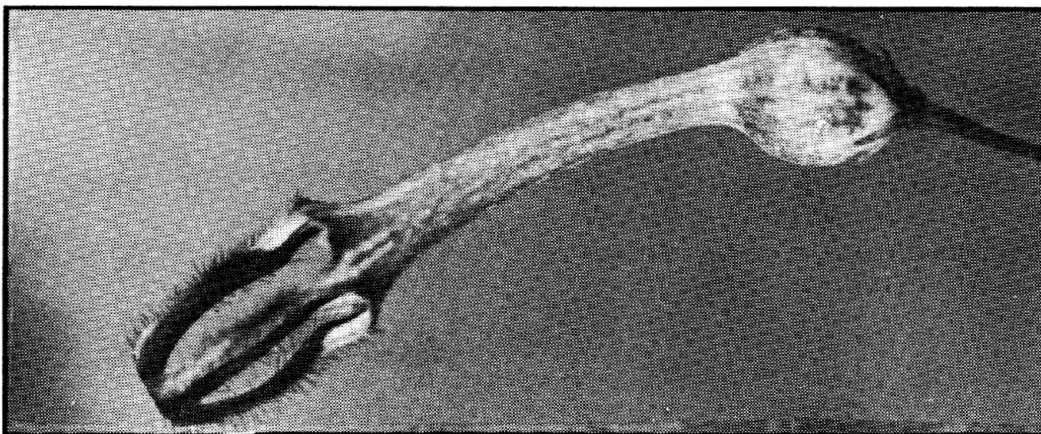
Pachypodium brevicaule

Photo: Mario Couvreur, Belgium

Grafting the Other Succulents

ASCLEPIADACEAE

There are a variety of slow and difficult plants in this group, and the ball flowered *Caralluma*, *Ceropegia dimorpha* (Madagascar), *Edithcolea*, *Hoodia*, *Pseudolithos*, *Tavaresia* and *Trichocaulon* come to mind. Seedlings and smaller plants of difficulty may be grafted on to stems of *Caralluma mammillaris* or tubers of *Ceropegia woodii*. Again, do the grafting on to prepared stocks in late spring when seedlings of some difficulty can become plants of easy cultivation.



Flower (pale to deep purple) of *Ceropegia woodii*

Ceropegia woodii is a succulent with long, trailing stems. It needs to be grown on a plastic trellis or similar support where it can show off its curious but most attractive flowers and small fleshy leaves to the best advantage. You can, however, just let the stems trail over the edge of the pot. Tubers will form where nodes touch the ground.

EUPHORBIACEAE

Most of the plants that we cultivate in this family are reasonably well behaved when we are able to give them a favorable environment. There are, however, a few choicer species which grow in specialized native habitats, which are not possible to sustain in cultivation. When we keep them too dry, they just shrivel up. When we water them they just rot off. A few of the more difficult species are as follows:

Grafting the Other Succulents

***Euphorbia abdelkuri* Balf.** (photo to the right which also appeared in our 1993 special edition) - This tall growing plant from the Socotran Archipelago is slow and difficult on its own roots.

***Euphorbia бага* A Chev.** A difficult ovoid caudiciform plant from Sudan, Ghana, Nigeria and Upper Volta.

***Euphorbia columnalis* Bally.** A difficult, tall growing species from Somalia.

***Euphorbia guillauminiana* Boit.** A small Madagascan shrub, stems to 1 cm. across. Best grafted.

***Euphorbia gymnocalycioides* Gilbert et Carter.** A rare, green chinned globe from Ethiopia, discovered in 1982

***Euphorbia hadramautica* Bak.** A widespread small, difficult species with stems covered in leaf scars. Arabia, Ethiopia, Somalia and Socotra.

***Euphorbia horwoodii* Carter et Lavranos.** Named for the late Frank Horwood in 1978. Difficult on its own roots, it has short, spiny, mottled arms. Somalia.

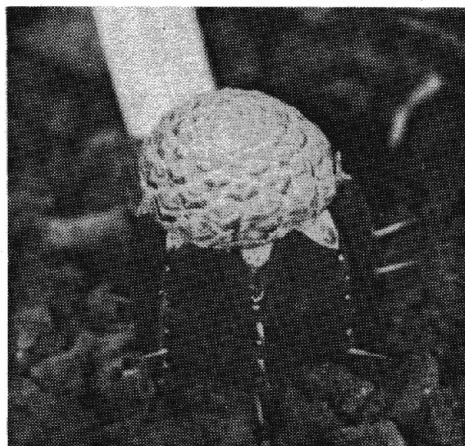
***Euphorbia napoides* 'nom prov'.** Dwarf solitary stemmed species, very sensitive to overwatering. Somalia.

Euphorbia obesa cristata Although this species may grow suitably on its own roots, most plants in cultivation are grafted for convenience.

Euphorbia piscidermis A whitish, scaly globe difficult on its own roots but does well grafted on to *E. ingens*. A ring of offsets is produced around



Euphorbia abdelkuri
Photo: Mario Couvreur, Belgium



Euphorbia piscidermis
grafted on *E. echinus*
Photo: Mario Couvreur

Grafting the Other Succulents

the top of the plant which can also subsequently be grafted. It is now more plentiful than it used to be. From Somalia.

Euphorbia poissonii Pax. A tall growing tender and difficult species from Ghana, Nigeria and tropical West Africa.

Euphorbia quartziticola Leandri.- Very similar to *E. primulifolia*, with a napiform root. Madagascar.

Euphorbia rubella Pax. A difficult and small growing geophyte from Ethiopia and Sudan.

Euphorbia suzannae v. cristata. Not comon in collections but grows better grafted. There is also a variegated form around which cultivates easier grafted.

Euphorbia turbiniformis Cheiv. A small caudiciform species which grows half buried in the sand. The top is slightly tuberculate. Difficult. South Ethiopia and Somalia.

Euphorbia unispina N E Br. A difficult thorny succulent shrub to 4 metres tall. Sudan and West Africa. Difficult on its own roots.

A variety of stocks may be used but some cereoid kinds with irregular growths of spines may look unsightly. *Euphorbia obesa* is sometimes used but is not entirely suitable nor is it quite the right shape for the job. *E. ingens* and *E. canariensis* are generally used and the smaller growing *E. fruticosa* is useful for smaller items and seedlings.

Grafting of *Euphorbia* is similar to the procedure used in grafting of *Cactaceae* but with a few basic differences.

Before any grafting can begin, a good supply of growing stocks must be obtained and kept in ideal surroundings. Late spring or early summer is the best time to begin your grafting program. A very sharp knife or scalpel with renewable blades is required. Make sure that the stock is well rooted and growing. Cut off the end of the stock near to the top, level, and bevel the edge or the ribs at 45 degrees. If the stock is in good growth the white latex sap will flow freely. Using a small spray gun, wash off the latex from the joint with clean water. Several applications may be necessary to stem the flow. Treat and cut the scion in the same way and when both surfaces are fairly clear, place together and secure with rubber bands, wool or the like. Place in a shady spot for two weeks while stock and scion should unite successfully. Keep moist and water from the bottom at this time.

Some of these grafted plants will produce offsets freely as does *Euphorbia piscidermis*. These can be subsequently grafted.

Remove all offsets from the 'stock' and root them up for use another year.

Grafting the Other Succulents

Some nurserymen now sell these grafted difficult rarities. Now that there is a way to grow and keep and propagate these rare and difficult items (by grafting) they will become more popular and prices are likely to fall somewhat. However, it is important that you are able to provide a warm, dry and sunny environment for these plants to prosper.

Rarer species of *Monadenium*, eg *M. stellatum* could be grafted on to *Euphorbia* stocks although to date I haven't seen any.

PORTULACACEAE

There is just one plant in cultivation from this family which causes growers some problems. It is a small shrubby bush from the Cape, Little Namaqualand and Namibia, called *Ceraria namaquensis*. Grafted plants are sold by nurseries and they are easy to grow on in a warm greenhouse. The problems start when you take cuttings and try to root them. They will not usually respond to your efforts and are best grafted on to prepared stocks of *Portulacaria afra* which is very common in cultivation. Stems should be sliced at a shallow angle early in the growing season and tied or bound together for two weeks, during which time they should unite. Subsequently the plant is of easy cultivation. ☆

The author would like to thank Chris Holland and Keith Grantham for their kind help in preparing the notes for this article.

Cartoon:
Dan Leavitt
Seattle, WA
The Point
Newsletter



How to Graft *STAPELIADS*

Doug Rowland

Seedlings and mature *Stapeliads* may be grafted on a variety of *Asclepiad* understock. Plants most commonly used for understock are *Ceropegia woodii*, *Stapelia nobilis*, *Stapelia grandiflora* and *Stapelia leendertiae*. Only *Asclepiads* can be grafted to *Asclepiads*.

Before one attempts grafting, the following should be present: warmth, bright light, clean working space, clean razor blades, rooted understock (although emergencies may necessitate using unrooted cuttings), and the plants to be grafted. The best time to graft is in spring or early summer when there is adequate warmth and light and when the plants are in active growth. Grafting is sometimes used, however, not only to speed the growth of difficult plants but also to save plants which have begun to rot. Rotting frequently occurs in the fall and winter when the



Diplocyatha ciliata

Pale gold flower

Plant & Photo: Alice Tabor, New Zealand

plants should be given only enough water to prevent shrivelling and dying back. Many *Asclepiads* will benefit from a little bottom heat in fall and winter to help prevent black rot. This is not the best season for grafting but one should not hesitate to use this procedure in order to save a rare plant. Grafting, then, can be used at any time of the year if conditions require it.

Clean working space and equipment are essential. The working space should be free of dust and dirt and it should be well ventilated and in a warm, bright location. Several new razor blades or a scalpel or sharp knife should be within reach. After they are spotted with soil or dust they should be washed clean and wiped dry before being used again. For best results, the understock to be used should be rooted and well established in a pot, although in emergencies unrooted cuttings can be used and then rooted after grafting.

How to Graft Stapeliads

With one clean stroke - and most importantly **no sawing motions** - the understock should be cut clean across with a clean razor blade, the cutting plane usually about half way up the stem. The top portion which has been cut off may be allowed to remain for the time being so that the cut tissue will not begin to dry. With another clean blade, the scion should then be cut. If it is a seedling, the cut should be above the seed leaves. If it is a mature plant which has partially rotted, the cut should be made well above the rotted portion, in clean and healthy tissue. Do not allow any of the cut surfaces to become contaminated with dust or dirt. Any foreign material on these surfaces will usually cause the grafting to fail. The scion should be held firmly in one hand while the other hand is used to remove the top portion of the understock, which remained in place to prevent the drying of tissue. The scion is firmly **and quickly** placed onto the cut surface of the understock. A gentle, circular motion may be used while placing the scion in order to squeeze out any air bubbles which may have become trapped between the scion and stock. When placing the scion, one should be certain that the vascular rings of both stock and scion are joined. Otherwise, the grafted portion will not receive nutrients from the stock and will starve.

The union of stock and scion occurs in *Asclepiads* in less time than in cacti. Usually ten to fourteen days are required for one to know if the graft was successful. After grafting has been done, the edges of the understock may be bevelled and the plant can be placed in a shady, warm location for a week or ten days. After this period, the grafted plant can resume its place in the collection.

The stems of the stock should be bevelled to suit the situation when the grafting is done. All stocks shrink a bit in the middle after union so beveling is always required. The plant to be grafted (the "Scion") should correspond in size and shape to the understock. Seedlings, of course, will be smaller than the stock on which they are to be grafted, but in no circumstances should the scion be larger than the understock. Obviously one should always keep a few suitable, rooted stocks on hand at all times.

Using A *Ceropegia* Tuber

If a *Ceropegia* tuber is used, the tuber should be placed on its side. Do not cut off the top of the tuber when grafting because the vine and leaves should be allowed to remain in order to furnish the tuber with the elements required to produce food. Tubers will graft top, bottom or sides!

Aftercare

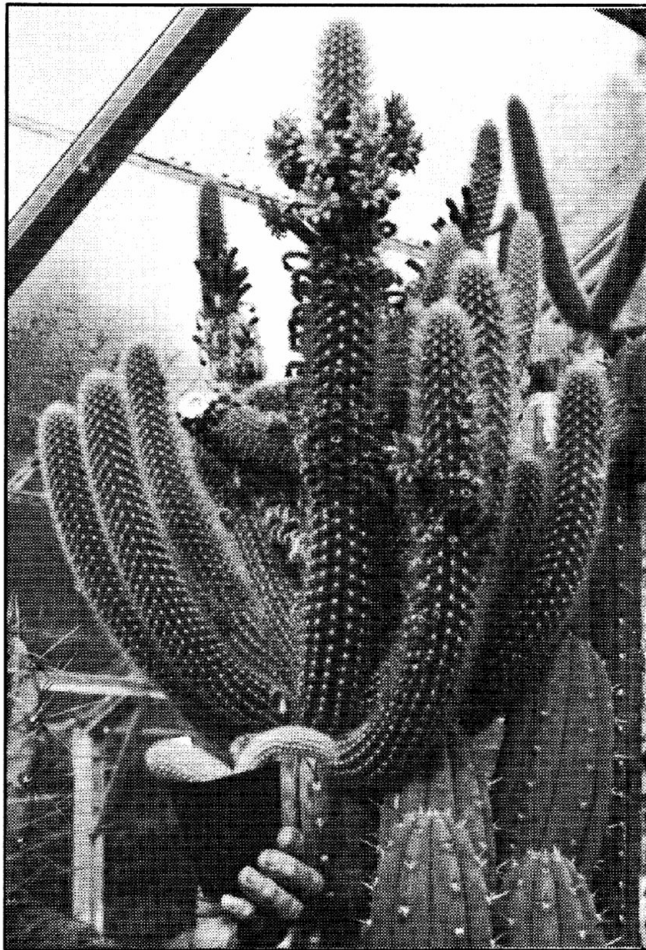
All offsets or sprouts from the stock area should be removed as soon as they appear to allow the stock to give full energy to the scion. ☆

Cactus Grafts

Alice Tabor
New Zealand

The stock plant in the photo (and you can see other stems of this to the right of the grafted plant) is *Trichocereus macrogonus*. The scion is *Borzicactus roseiflorus*. The photo also shows a small plant in a pot which is also *Borzicactus roseiflorus*. Both are from the same seeding. Grafting has caused the *Borzicactus* to grow about a hundred times larger than would the plant have grown if left on its own roots.

Borzicactus grow well on their own roots and there is no need to graft them other than to produce, if you want one, an interesting show plant as I have done. My other reason for deciding to graft of



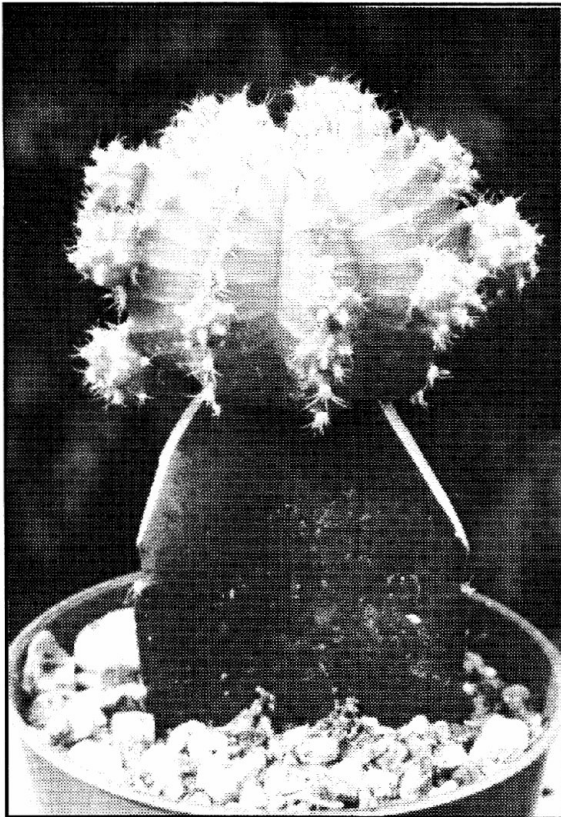
course was to do something to improve the look of the *Trichocereus*. A beheaded plant, after all, is not attractive. The *Trichocereus macrogonus* had grown so tall that it threatened to go through the greenhouse roof where we previously lived. I had no choice but to cut off five inches of the plant at that time, which five inch cutting rooted in open soil and has flowered on and off all summer.

My method of grafting is simple. I hold the scion on with two pieces of nylon stocking - cut in two strips. I tie a stone in each end and drop the strips (crossing each other) over the top of the scion. Spines stick through which hold it in place and I don't get punctured in the process. Stones tied in the strips should be just heavy enough to hold the scion on firmly. If too heavy the scion could be squashed or marked.

Borzicactus roseiflorus on *Trichocereus macrogonus*-Photo:Alice Tabor

Cactus Grafts

I never graft just for the fun of it. Usually I use grafting to save a plant that is not doing well on its own roots. For stocks I mostly use and have success with *Echinopsis* Paramount Hybrids. They always have lots of pups to root to use for more stock plants when I need them. I tried grafting *Notos* and *Rebutias* on *Trichocereus macrogonus* but they did not take. ☆



Gymnocalycium mihanovichii cv. Hibotan
grafted on to *Hylocereus* stock

Photo: Vivi Rowland

Marina Welham

Lacking in chlorophyll the red scion on the graft to the left will not live on its own roots. The pups can be left on the plant or removed and grafted on to other stocks. While Doug Rowland has said this grafted plant usually produces weak or poor flowers, luckily the one I have has produced strong, continuing pink blooms for most of the year. I have in fact been amazed at its flower production over such a long period of time.

Hylocereus is not always the best grafting stock. If you keep your cactus collection in a cold place in winter months, *Hylocereus*, which needs warmer conditions, is prone to rot. It is wise to find out before you choose any stock whether the plant needs warmer conditions in winter because if you cannot supply that warmth you stand to lose both the stock and the scion.

You cannot graft just any old cactus on to any old cactus. Best results are obtained if the stock and scion are of closely related genera.

Also remember that if you try a graft and the stock fails to marry the scion, the now beheaded stock will provide you with a multitude of offsets to root and use for future grafting attempts.

Cactus Grafts

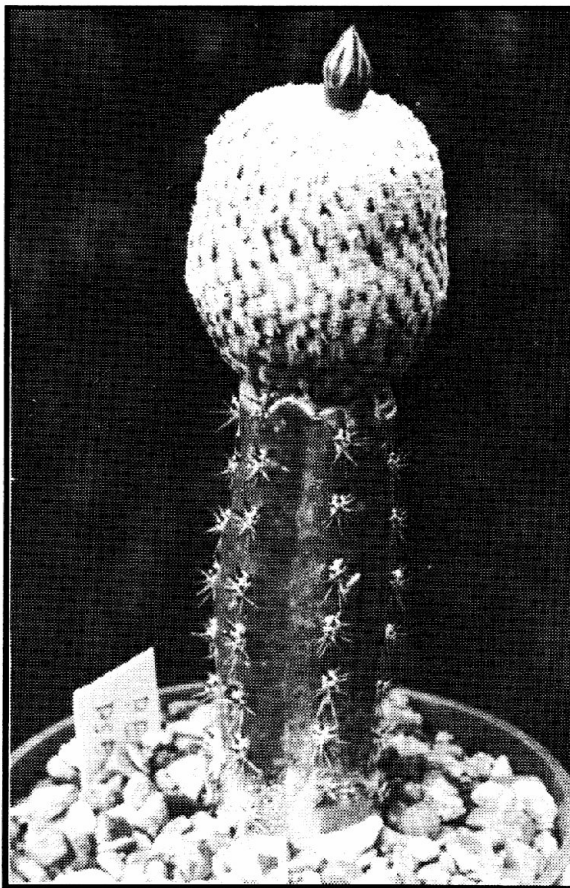
If you have no stock plants at all, the quickest way to obtain some is to grow *Cereus peruvianus* from seed. Seedlings four inches to six inches high are sufficiently large for stock plants and since these are quick growing you can have stock plants ready in just one season. ☆

De-Grafting

Doug Rowland

In early spring detach (slice) the scion off the stock where the two join each other. Allow to dry off and callous over. After about a month, dip the cut end of the scion in a little rooting compound. Make up a 50/50 peat and gravel mix, which should be dry, and pot up the degrafted plant. It helps to provide bottom heat in a propagator with lid removed so that dry air can circulate.

Pereskopsis tip grafts of seedlings of *Sclerocactus*, *Toumeyia*, *Navajoa*, *Pediocactus*, *Rebutia narvaecensis*, *Uebelmannia* and some *Discocactus* will not grow well on their own roots in cultivation and will eventually die. These larger seedlings must be re-grafted on to suitable *Cereus* or *Trichocereus* stocks in early summer to give them the benefit of a full season's growth on their new stock, which by the way, will not be as vigorous as the former *Pereskopsis* one.



**Pelecyphora pseudopectinata*

Photo: Vivi Rowland

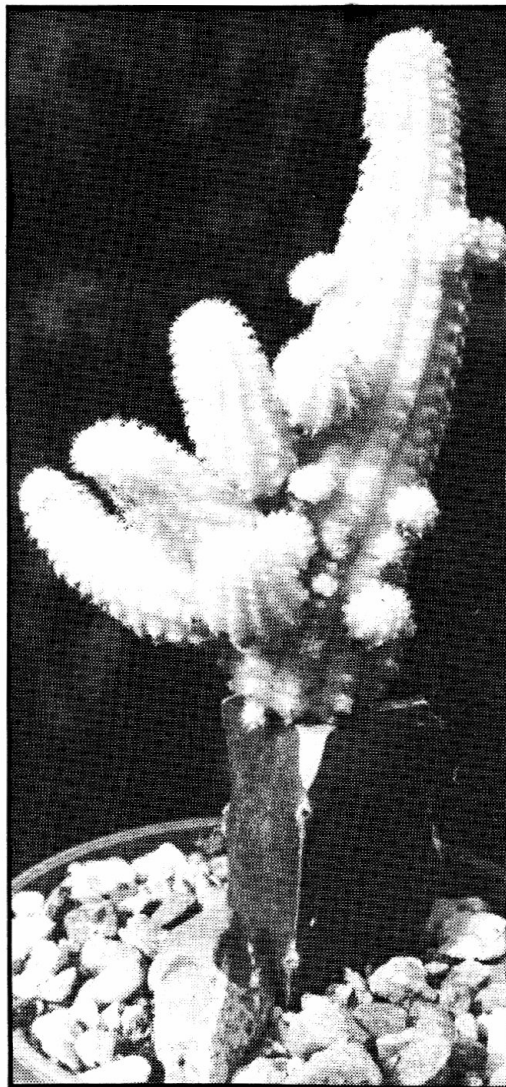
*Stock plant unknown. Might be a *Trichocereus* which is often used as grafting stock. This particular plant hails from the Czech Republic where the collector and grower there almost exclusively uses *Hylocereus* for grafting.

Cactus Grafts

Color forms of *Chamaecereus silvestrii* and *Gymnocalycium mihanovichii* cv. Hibotan, Red Cap, Black Cap and Pink Cap can never be degrafted to grow on their own as these plants lack chlorophyll and will not produce roots.

The cultivation for these 'color' cacti is quite different from normal desert cacti. The stocks usually used for plants you purchase are Central American tropical cacti (*Hylocereus*), which will not survive in a cold cactus house. The colored scions are a problem too because hot sunshine will burn them. They are also susceptible to cold. The successful and sure way to cultivate the color plants is on a window sill of a double glazed window in a centrally heated living room where there is warmth year round.

When 'color' grafts produce offsets freely, these can be detached and grafted on to *Cereus* or *Trichocereus* stocks. I don't recommend grafting the Red Hibotan *Gymnocalycium mihanovichii* on to *Trichocereus*, however, because the plant can grow down over the stock and the union may eventually be half way up inside the body of the scion. ✪



Chamaecereus silvestrii cv. *lutea*
grafted on to *Hylocereus* stock

Photo: Vivi Rowland

The Very Different...

S P I R A L A L O E

Terry Sibley, South Auckland, New Zealand
and Doug Rowland, UK

Aloe polyphylla, Schoenl. et Pillans - Family *Liliaceae*



Aloe polyphylla - showing leaf form and source of inflorescence

Spiral Aloe

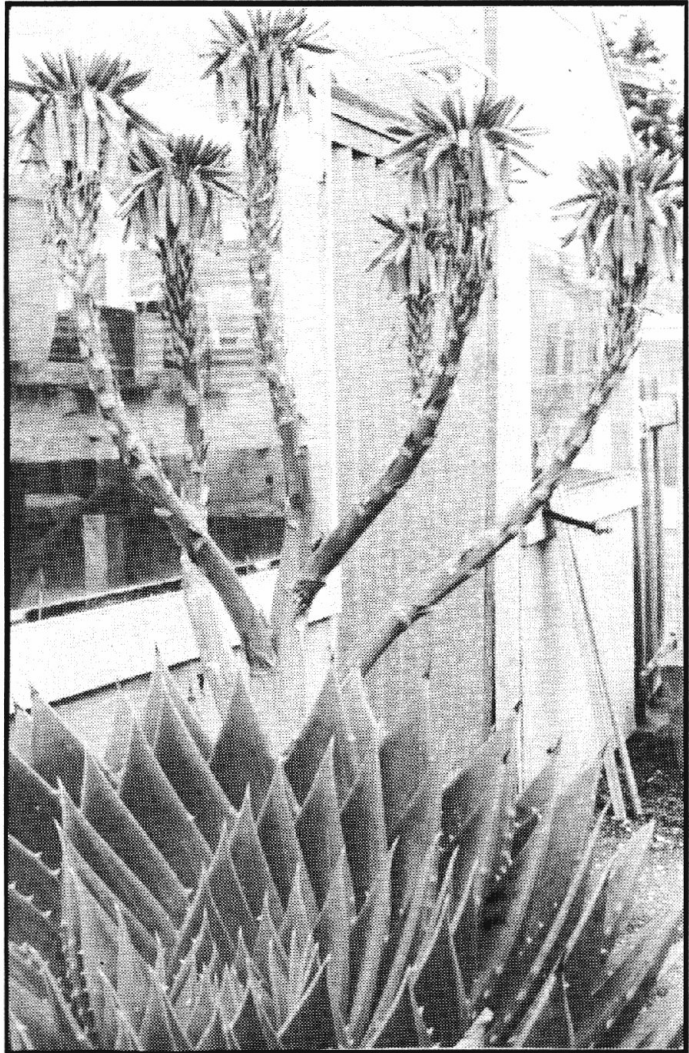
The name '*polyphylla*' means 'many leaves'. This plant is commonly known in the succulent plant hobby as the Spiral Aloe which refers to the leaf form which is unique to this species. Also unique is the plant's habitat in the high mountains at around 8000 feet in Lesotho. It grows in damp, rich soils on steep mountain slopes which are often very wet, but well drained.

This *Aloe* is subject to winter frosts and is occasionally covered in snow in winter. The local summers are cool when 30 to 40 inches of rain can fall at this time. The habitat is also subject to fogs and a lot of low clouds. For successful cultivation of this species, these habitat details should be kept in mind.

The plant and its inflorescence grow to about 1 metre tall and the stalk is very short. Rosettes can be from 50 to 60cm in diameter in habitat and to 1 metre in cultivation. Rosettes are usually solitary but in favorable localities small clumps will form in age.

There can be 75 to 100 leaves in the spirally arranged rosettes and these can appear in the clockwise or anti-clockwise mode. The grey green leaves have a cartilagenous keel and edges which are toothed in five spirally aranged rows. The panicle is 50 to 60 cm (25") tall and is branched. Flowers can be a dull red to salmon pink and rarely yellow. Terry's plants in his photographs have salmon pink flowers.

Terry and his friend who live 68 miles apart, both grow a plant of *Aloe polyphylla* outside in large tubs. They are seven years old from seeds raised by another enthusiast.



Aloe polyphylla, in flower, outside in South Auckland

Spiral Aloe

Both plants are now in excess of 2 metres in diameter. Over the 1992 Christmas and New Year period, both plants flowered together causing great excitement at the prospect of pollinating. There was, however, the problem of the 68 miles to overcome. Over a three week period they travelled to each others plants to pollinate them with a small, soft camel hair brush.

The two plants are of different clones and some of the pollination was successful. Both plants are very vigorous having rooted through the drainage holes of the tubs into the open ground.

The seed capsules took two months to grow on to maturity, their full size being 45 x 13mm. After successful pollination, fertile capsules commenced to grow in an erect and upright mode while unsuccessful ones remained pendant and dropped off. Flowers appeared to be more receptive on warmer, sunny days and flowers appeared to be more receptive to pollen after they had shed their own.

To make life a little more difficult, Terry found that most flowers were receptive for only two days.

Seeds are greyish brown, twisted and of uneven triangular section and 7mm x 5mm.

This plant is difficult to cultivate in hot, dry desert climates and will frequently die if exposed to such conditions. It prefers a damper, cooler climate with rich, well drained soil. Suitable conditions exist outside in North Island and in New Zealand where there are plants happily in cultivation.

The method for successful cultivation of this *Aloe* is unlike any other due to its very specialized habitat conditions. Keep plants in the correct size pots for their diameter. Give them a rich, well drained soil. Keep fairly cool and allow light shading in summer. Plenty of fresh air is a must. Water regularly during the summer growing season and keep just moist in winter. Do not allow temperatures then to fall below 48°F.

At one time a steady number of this species were imported but this ceased long ago. Propagation is from seeds which are always scarce and difficult (though not impossible) to obtain. Some difficulty is to be experienced in germination as they do not respond readily to methods used to germinate other desert *Aloes*. Seeds must be kept wet for some weeks. This is essential to success.

Seeds may be germinated on a piece of absorbent filter paper in a covered glass dish. A mix of clean water and a suitable fungicide such as Chinosol should be used. We have germinated the seeds successfully using a teaspoonful of this mix and a snap top small, clear plastic bag. Place the mix and seeds into the bag and exclude air. Place on a sunny windowsill during late spring or early summer for six weeks at least. Remove sprouted seeds very carefully with tweezers and pot up into prepared containers of gritty seed raising mix. Place on gentle bottom heat in a propagator, allowing air to circulate freely. Whatever you do, you must not discard ungerminated seeds after a few days. Give them a chance. Have patience. Persevere with them. Do not allow the pots of seedlings to dry out. Keep moist at all times.

Grow on in light shade. Water regularly. Move up into larger pots as required.

Spiral Aloe

Caution: *Aloe polyphylla* requires cooler, moist conditions to grow well. Do not place it with or treat it like you would your desert *Aloes* as it has very different requirements from those. Keep this very special plant in a nearby handy spot so you can attend to its very special requirements.

Aloe polyphylla is not very common in UK collections now but it does grow quite well in our cooler, cloudy and often sunless summers.

We are very grateful to Terry Sibley for his permission to use the series of photos with this article. We especially appreciated and enjoyed his story behind the chase to pollinate these beautiful plants.



Aloe polyphylla showing branched inflorescence and flower

If You Like
a Challenge...

Grow BROMELIADS

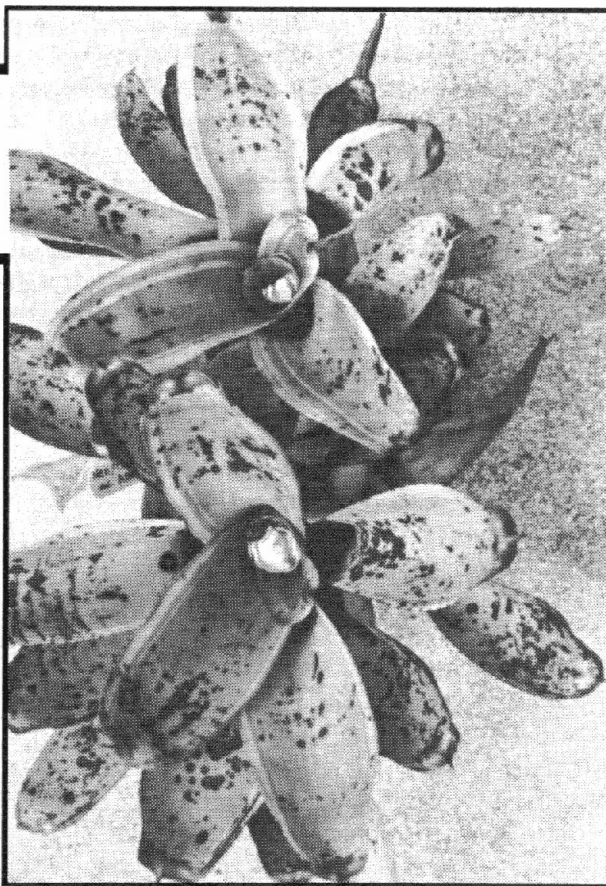
Marina Welham

From Seed

Few have the patience to grow Bromeliads (family Bromeliaceae) from seed but if you have lots of time and the challenge intrigues you, here's how to proceed.

Gathering Seed

Fruits of most species are berry-like and will ripen in two or three months. Birds, mice and other crawlers enjoy these fruits so depending where you keep your Bromeliads, keep an eye on the fruit as it develops or you will lose it to munchers looking for a feast. Many fruits will turn darker and softer at maturity and should be removed as soon as ripe.



Neoregelia concentrica var. *albo marginata*

Parent plant is on the bottom - pup on top. Pale green stems mottled purple and edged in pink. Plant & Photo: MaryAnn Delaune, Metairie, LA. "You can see the sky and trees reflected in the water in the cups of these plants."

Cleaning, Storing & Viability

Once gathered, seeds should be carefully cleaned, dried and treated with Chinosol or another good disinfectant, then placed in envelopes or small containers until ready for use. Bromeliad seeds will retain their germinating ability for several months but rarely more than six months. For best results plant as soon as possible after harvesting and cleaning.

Bromeliads

Planting Mix

A good planting mix is a combination of peat, clean sand and crushed granite or similar granular material. Heavy on the peat. Lighter on the sand and still lighter on the granular material. Mix this well and spread in a pan over a layer of whatever you usually use on the bottom of seed pans to promote drainage. And make sure the pan has drainage holes in the bottom. Never use this planting mix more than once. Water the mix carefully and sprinkle the seed on top. A light sprinkling of sand can be sifted on top of the seed bed but not enough to cover the seeds. Spray (gently) the entire surface with water. Cover the pan with a piece of glass or rigid clear plastic so there is about an inch of space between the seed bed and the covering. Over this glass or clear plastic place a white sheet of paper leaving it in place for several days until the seeds begin to sprout. Germination time ranges from seven to twenty days. Do not put the seed tray in the sun. Bottom heat kept at 70-80°F will give you best results. And remember to ventilate occasionally to let air circulate.

Germination should be high if seeds are well formed. Some species of bromeliads will set fruits with the seeds thin or undeveloped and completely sterile but as a rule when the fruit is fully developed the seeds are good.

Never let the seed bed dry out or on the other hand allow it to remain soggy wet. Sprinkle with water when needed rather than soak and if damp-off creates a problem, add a damp-off preventive to the water before watering. Rain water is better than tap water.

Treatment of Seedlings

Once seedlings are a half inch high use a good house plant fertilizer. One teaspoon to a gallon of water is sufficient and apply once a week.

Seedlings can be transplanted when they are an inch high using the same basic mix as was used in the seed germinating tray but from then on fertilizing should be half that recommended for smaller seedlings. Grow seedlings in light shade and never direct sunlight.

Problems with Tillandsia (See Care Advice Page 44)

It takes one year from flowering of mature plants for mature parent plants to ripen their seeds (there are exceptions where the process only takes six months). Seedlings of the genera *Vriesia* require several more years to reach maturity than do most of the species belonging to other genera of the family. These seeds are very small and very delicate and are borne on tiny silken parachutes which may suddenly open and be blown away if you are not on guard to watch them. Seeds are dry when the fruits are ripe and have burst open so they don't need cleaning as there is no pulp around them. For good germination Tillandsia seed should be as fresh as possible.

Established Plants

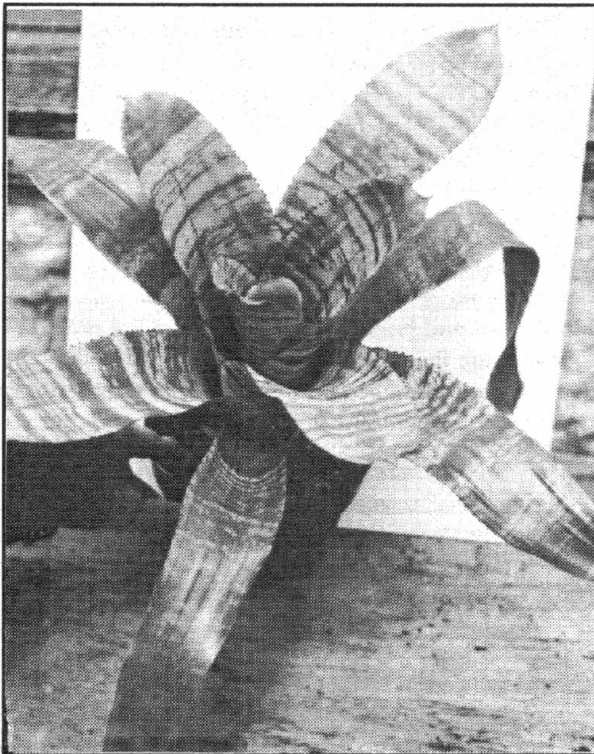
Watering - Bromeliads do need water. While in nature many live in or near treetops and are exposed to wind, a dry atmosphere and lack of rain, they do take their moisture

Bromeliads

from heavy dews or from moisture carried on the wind. While they can thrive for weeks without rain in the wild, in cultivation in the greenhouse or home many need fairly frequent waterings. Because there are many types of conditions under which various bromeliads live, it's wise to find out what natural conditions would be for your particular plant(s) and be guided accordingly as to the amount of water those plants will need. If you grow them in a location with high humidity, obviously less frequent watering is needed. If grown in the dry atmosphere of the home, more frequent watering is needed. Where leaves form a natural cup to hold a continuing supply of water this should be rinsed out and refreshed from time to time to avoid build-up of excessive lime or salt. Rain water, if you can collect it, is better for bromeliads than tap water, especially if your tap water is alkaline. If collecting rain water is too much of a chore, put your bromeliads outside in warmer months and let them enjoy a natural shower of rain.

Whether or not you should water in winter months depends on the climate where you live. If your plants are growing in a cool location, less watering is needed because evaporation time is much reduced. If grown year round in warm conditions where artificial heating keeps the air dry even during winter months, some watering will be needed year round to avoid excessive drying out. You really have to use your own judgment.

Light - It is important that all Bromeliads have plenty of light. Most will have best color and growth in full sun. Common sense again should be used during the hottest months of the year. If you are growing any plants including bromeliads in a greenhouse, some shading from a cooking sun should be provided.



Aechmea fasciata

Commonly available, this bromeliad with silvery grey leaves dusted with white down, produces a beautiful pink flower (bract).

Photo: Roy Welham

Bromeliads

Temperature - Although bromeliads are tropical and subtropical plants, they should not be subjected to excessively hot temperatures. 50 to 70° F is ideal. If you raise them in a hot greenhouse, it is imperative to provide maximum ventilation and better still to provide a fan to keep air circulating and fresh.

Pests - Bromeliads are mainly bothered by scale insects. If left uncontrolled the plants eventually become weak and unsightly. The application of commercial products (such as Malathion) designed to get rid of the scale should not be used on Bromeliads with glossy leaves as the leaves may be injured. In this case, if the scale is a bad infestation it may be better to cut off the entire plant leaving an inch or so at the base and then hope for a new shoot to form to begin a new plant. You would of course destroy the scale infested portion and make sure there is no scale on the inch or so at the base by removing any by hand. Never spray plants in full sun.

Propagation - Propagation is by seeds and offsets. You will have a greater number of offshoots if you remove them as soon as they have reached a size large enough for them to withstand the shock of being separated from the mother plant, usually about a quarter of the size of the main plant. You can usually remove them by pulling gently and rocking the offset from side to side. Failing that a knife may be used, carefully. Offshoots can be potted up immediately. Offshoots will reach flowering maturity faster than seed grown plants, some even in the following year.

Potting Medium - A light potting medium is best. For most bromeliads wood bark and redwood chips are excellent. Chips should be small enough to compress the plant into place in the pot and hold it steady. Commercial orchid mixes are ideal too. As with all plants, make sure the pots are clean.

A very good reference on the subject is Rauhs' 'Bromeliads For The Home Garden and Greenhouse', Blandford Press. It's out of print but you might find it with a favorite book dealer."

Information Taken From- Bromeliads, A Cultural Handbook
of The Bromeliad Society, Inc. (1959)

Mulford B. Foster, Author

Thanks to Clive Innes for advice
about contents of this article.

Doug Rowland says ...

"Cactus growers usually grow *Terrestrial Bromeliads*, which grow in clumps on the desert floor in Mexico and southwards well into Argentina. They are plentiful in Tula Tam. where *Neogomesia (Ariocarpus) agavoides* grows on gravel ledges on hillsides to escape the encroaching terrestrials. Terrestrials are tough old plants and do well in a cactus house environment and are almost winter hardy here in England - but not quite.

Germinate seeds as for cacti. Good terrestrial seeds will produce plenty of tough little rosettes with a thorn at intervals down every leaf which catches on just about everything and is very taken up with net curtains and woolly pullovers!

Succulent

BROMELIADS

Clive Innes

My very first encounter with terrestrial Bromeliads dates back very many years. It was on one of my very first trips to Mexico—being a very enthusiastic Cactus fanatic, I was naturally seeking to find cacti in habitat. However, whilst I was looking specifically for *Mammillaria boolii* which I understand grew on the mountain slopes of San Carlos Bay by Guyamas, I encountered endless patches of particularly spiky rosette plants and these definitely created a great interest. I was later to discover that this was a member of the *Bromeliaceae* one of the several terrestrial species, the majority of which were assuredly succulents! This Mexican species, *Hechtia montana* is but one of 50 or so members of this genus. Hermann Jacobsen in his *Lexicon of Succulent Plants* mentions but three genera as being succulents—*Abromeitiella*, *Dyckia* and *Hechtia*—these alone accounting for well over 100 species which undoubtedly are succulents. *Puya* is a large genus centered in South America from Colombia and Ecuador to Peru, Chile and parts of Argentina and Bolivia. Not all are succulents, but many are, including the popular *P. laxa* with its thick fleshy leaf bracts densely coated with white scaly hairs and thick white felt, and flowers of deep violet. *P. maculata* is yet another and the borderline succulents are endless!

Deuterocohnia

Deuterocohnia is another South American genus containing only a few species all of which are truly xerophytic and with one or two such as *D. longipetala* and *D. haumanii* which are definitely succulents. The latter has a rosette of leaves 30cm or more in length, about 3cm wide, remarkably fleshy and spiny, narrowly triangular in shape and recurving. The prominent inflorescence is branched and often attaining 60cm in length. Other genera could be mentioned but these might well wait for a future article.

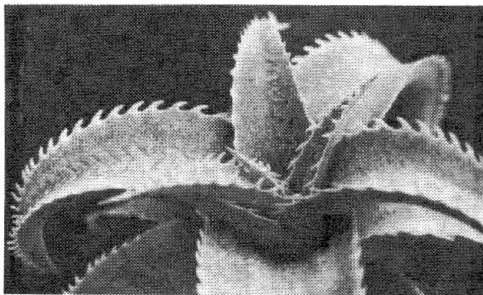
Perhaps more needs to be said concerning the genera referred to by Jacobsen!

Hechtia

Hechtia rosea from southern Mexico is one of the very few species of the genus with flowers other than white or greenish. This has a pyramid-shaped inflorescence of many rose-red flowers on a scape 60cm or more long. The wide, spiny leaves are dark-glossy brown in color and arranged in a dense rosette. A choice find of more recent days is *H. marnieri-lapostollei*, another Mexican species with a rather small few-leaved rosette, the leaf bracts are densely coated with greyish scales and minute upwardly curved spines-giving the appearance of being felted. The loosely compound inflorescence

Succulent Bromeliads

carries small white flowers. Going back to my first acquisition, *H. montana*, which is a truly large clump-forming species, the leaves can be 20cm or more long and form a dense semi-erect rosette—the upper surface of the leaves being green and striped, whilst the underside is white scaly. The inflorescence is many flowered, each pale yellow flower being well stalked.



H. marnieri-lapostollei

Dyckia

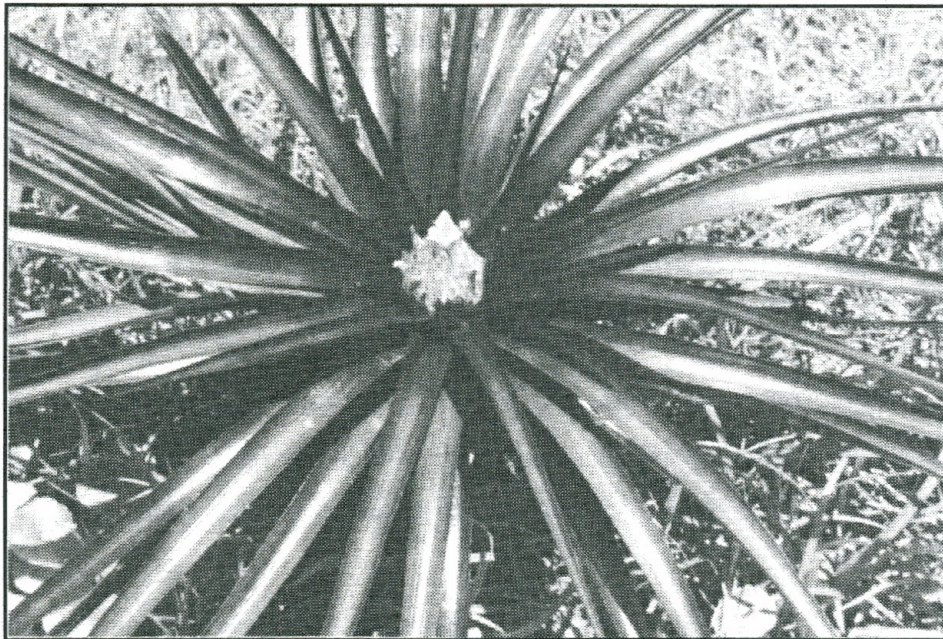
Dyckia still holds pride of place with many collectors in Europe, maybe because they are more readily available, all 60 or more being delightful plants to acquire. *D. cinerea* is a Brazilian species, flourishing on rocky areas of Minas Gerais at altitudes of about 1500m. A really lovely plant with its ashy-grey, thick fleshy leaves formed into an arched rosette. The long grey scape carries a many flowered inflorescence of bright orange blooms. *D. choristaminea* is a yellow flowered plant originating from Rio Grande do Sul where it thrives on open rocky territory. Plants are found in dense clumps, each rosette having numerous slender recurved, green, grey-scaly leaves. Many others deserve mention, but space does not allow. Perhaps another time!

Cultivation

Cultivation wise there are next to no problems. If you can grow a cactus well, then these terrestrial bromeliads are comparatively easy. Treat them just as you would the so-called desert cacti—regular watering throughout the growing and flowering season, but kept completely dry throughout the colder period of dormancy. Use a very open compost slightly enriched with a slow release fertilizer—the addition of thoroughly decomposed leafmould will also prove beneficial. Above all, ensure plants are placed in the sunniest and warmest position possible throughout the year—the result will be excellent growth and numerous spikes of attractive flowers! ☆

How I Grow Bromeliads From Seed

MaryAnn Delaune, Metairie, LA



Neophytum x Ralph Davis (bright red leaves graduating to a brownish color at ends)

Plant & Photo: MaryAnn Delaune, Metairie, LA

With the exception of *Tillandsia*, I have successfully grown Bromeliads from seed.

This is my method:

Use a wide-mouthed glass jar (gallon pickle jar is ideal.) Use equal parts of sifted peat moss, perlite and vermiculite, fine grade. Moisten with either distilled water or rain water, not too wet. Take a handful of mix, squeeze tightly and then release. If mix breaks apart when lightly touched, it's just right. Fill jar to a depth of about 3" with this and then cover with long-fibred moss. I sometimes cut the moss into smaller pieces. Mist spray and sprinkle seed on top then spray again. Cover tightly and place in a bright, warm spot. No direct sunlight. Remember the inside temperature of this closed container. You don't want to cook your seeds.

How I Grow Bromeliads From Seed

Use no chemical fertilizers on immature plants. Keep watch for a few weeks to make sure the condensation within the closed container is adequate to remoisten the medium without saturating it. Then forget about the whole thing until you notice lots of little green things putting in an appearance. Can't give you exact germination periods since each genus is individual. Proper temperature/light plays an important part in the germination of seeds. When seedlings put in an appearance, remove the metal cover of the jar and replace with plastic wrap, held tight by a rubber band.

To harden off seedlings, begin to punch holes in the plastic wrap until you feel that the seedlings can survive without the extra humidity. Even when seedlings have been moved to individual pots, they are still high-humidity-loving plants so will enjoy an occasional misting, more while they are adapting than when they are established.

Young plants enjoy a lightly moist potting mix, while mature bromeliads prefer to obtain moisture through their foliage. Roots on most mature Bromeliads (terrestrials the exception) use their roots only to secure themselves to where they have chosen to grow. Treat them as you would any of your epiphytes. ☆

How to look after

TILLANDSIA

Vida Cairns, Olympia, WA

Tillandsias are atmospheric air plants. They are Bromeliads, related to the Pineapple Plant. They take in water and food **through their leaves**, much as a sponge absorbs water.

The roots of these plants only grow to anchor the plants to tree limbs, rocks or other places where they will get free air circulation and receive the dew that settles on them nightly and rain when it falls.

In house culture we have to adjust for dry air, no dew and usually poorer light.

Water

The best way to water *Tillandsias* is to submerge the plants in water for 15 minutes or so. This allowse them to absorb a good drink. How often you will need to do this will depend



Tillandsia cyanea

(Pink quill)

Tillandsia

on your home environment. By letting the plants be your guide you should be able to grow them quite well. Watch the leaves as this is where the water is stored. If they are losing their plumpness, they need water. Some leaves roll lengthwise when dry. Others tend to curl and twist like a ribbon when dry. The greener looking ones will require moisture more often than ones that look silvery grey or white.

Fertilizer

A few drops of liquid fertilizer may be added to the soak water in spring through summer. Don't overdo as it will cause them to grow unnaturally and lose their tight, compact appearance.

Light

Greener Tillandsias prefer indirect light. Silvery grey or white ones need bright light to full sun.

All of them need free air circulation. **Do not** bury the bases in a pot or wrap moss around bases of plants.

How to Mount Them

Use a clear silicone and a small disguise of moss to hide the silicone. Hot glue may be used if only roots are glued. If the hot glue touches the heart of the base of the plant it can cook the plant and cause it to die. ☆

Drawing: Ency. of Houseplants, Chapman, Davidson, Martin

The European Bromeliad Society, President, Mr. Clive Innes, invites you all to join their membership. Regular journal included in fees. UK Membership £7.50. International £12.50. Write for information leaflet to The European Bromeliad Society, Honorary Secretary, J. Ainsworth, Bank Farm, Bank Head Lane, Bamber Bridge, Preston, PR5 6YR, UK. Seeds available to members as of the end of 1993.

The Bromeliad Society Inc., Membership Secretary, Linda Harbert, 2488 E 49th, Tulsa, Oklahoma 74105, USA. Excellent color journal published bi-monthly, 95 pages. Annual fees including journal \$20 in US, add \$5 for international and another \$7.50 for first class or airmail. This Society offers a number of related publications including Bromeliads, A Cultural Manual, 43 color illustrated pages. Handbook for Judges, Exhibitors & Affiliates, Listing of all Known Cultivar and Grex Names for the Bromeliaceae, etc. Seeds available from Harvey C. Beltz, 6327 South Inwood Road, Shreveport, LA, 71119-7260.

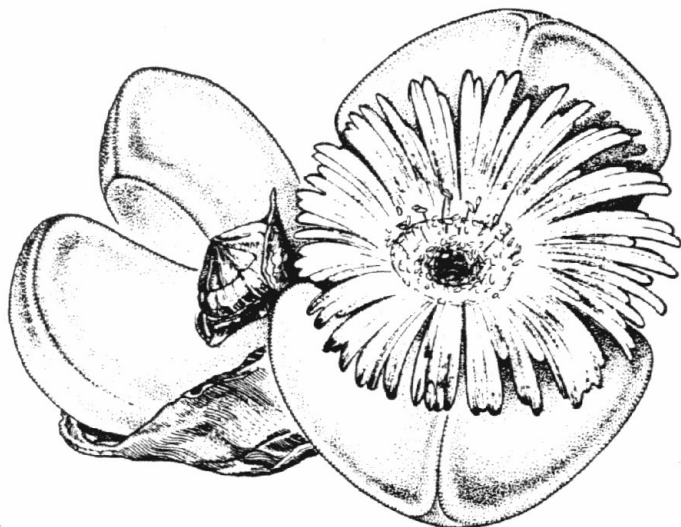
The Cryptanthus Society, affiliate of The Bromeliad Society Inc., Kathleen Stucker, Secretary, 3629 Bordeaux Court, Arlington, Texas 76016, USA. Membership \$10 USA and \$15 international, includes four colorful issues of The Cryptanthus Society Journal. Send SASE for cultural information or \$3.00 for sample journal.

The Bromeliad Society of Australia Inc., P.O. Box 75, Kenthurst, NSW 2156, Australia. No details on hand but you can contact them for information.

MESEMBRYANTHEMACEAE

Doug Rowland

Artist: Carla Wolters
Holland



Argyroderna pearsonii (N.E. Br)
Schwant

Argyrodermas are easy to raise and grow but some are difficult to flower in cultivation. They grow in summer. This plant has reddish flowers about 1" across. MW

The name *Argyroderna* comes from the Greek, argyros = silver and derma = skin. So, 'silverskin'. The genus was described by N.E. Brown in the *Gardeners' Chronicle* in 1922. The habitat is the Van Rhynsdorp Division of Cape Province, Republic of South Africa and is not widely distributed.

This species may occasionally be found under the name *A. ovale* which name was assigned to it by Dr. H.M. Louisa Bolus. *A. pearsonii* is a stemless, ultra succulent type. Bodies are light silvery green and leaf pairs can be from 20mm to 40mm long. It seldom clusters and dead leaves remain persistent. The leaves are semi-globose and the fissure is narrow. Flowers, 25mm across, can vary in color and can be purplish and white and occasionally yellow and orange and are seldom white.

Propagation from seeds which germinate well and are usually available in the hobby. *Argyroderna* are all summer and autumn growers. They need plenty of sunshine to flower in cultivation. In the United Kingdom plants choose to flower in early November when sunshine is declining. These plants will remain small and never embarrass you for space not even after ten years from seeds. For this alone they are popular with all *Mesemb* enthusiasts. They will overwinter in a cactus house but should not be subjected to temperatures below about 48°F.

Finally, remember not to overwater in the growing summer season, or the silvery outer skins will crack and become rather unsightly and will show your bad cultivation until the new bodies appear the following year.

Mesembryanthemaceae

Bergeranthus multiceps (Salm)
Schwant.

A dense, tufted, stemless, freely suckering plant with fleshy roots. Flowers appear in June and July and are about 1 in. across, yellow and red on the outside. This species is fairly free-flowering. Flowers open in the afternoon. Keep these quite dry in winter. mw

In 1922 this genus was named by Dr. Gustav Schwantes in honor of the botanist Alwin Berger of Stuttgart, Germany.

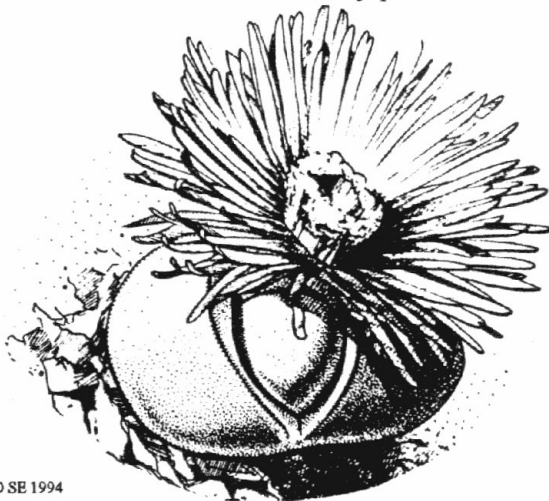
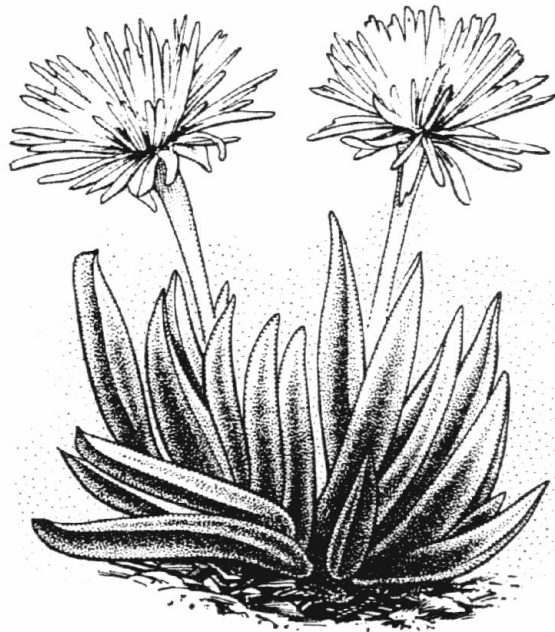
There are about 11 species of *Bergeranthus*. *B. multiceps* is from habitats in the Eastern Cape Province in the Port Elizabeth and Uitenhage areas.

B. multiceps is fleshy leaved and clumping with tuberous rootstock. It has narrow, pointed semi-keeled green succulent leaves which form rosettes. Plants are fairly low growing to 3cm high. The bright yellow flowers which are up to 3cm across, appear on longer stems and stand clear above the leaves. Popular with collectors it is easy to grow and flowers with great regularity in high summer in the afternoons. It is a useful, pretty and a very tough beginners' plant, tolerant of neglect if it has to be. Cultivation is easy in a warm greenhouse. Growing in summer it flowers during the longest days of June and July. Propagation is by detached rosettes or from seeds which are fairly plentiful and readily available.

Dinteranthus pole-evansii
(N.E. Br) Schwant.

Dinteranthus require a bright situation throughout the year.

They grow in summer and should be watered sparingly then but kept quite dry in winter. Seeds are smaller than any of the other mesembs. Surface of this plant is distinctly wrinkled, dove-grey, often yellowish or reddish. Flowers are glossy buttercup-yellow. mw



*Mesembryanthemaceae**Dinteranthus pole-evansii* con't ...

This genus, described in 1926 by Prof. Dr. Gustav Schwantes, is named in honor of the botanist, Prof. Kurt Dinter and the name is from the Greek anthus = flower.

There are six species popular with collectors, seeds usually being available for all of them. *D. inexpectatus*, *D. microspermus*, *D. pole-evansii*, *D. puberulus*, *D. van-zijllii* and *D. wilmotianus*.

Habitat is in the Cape Province in the Prieska Division and is not widely distributed. Plant bodies in all the species are a very distinctive dove grey color tinged pinkish.

Plant bodies of *D. pole-evansii* are usually solitary and the leaf pairs are very succulent, united for half of their length distinctly dove grey in color to 4½cm long. The undersides are curved and rounded and some surface wrinkling may be observed.

Flowers are large and showy, glossy yellow up to 4cm across. Seeds are numerous. Often 3000 will occur in one capsule. They are extremely small and dust-like with surfaces seen under a microscope being minutely rough, lightish brown.

D. pole-evansii is of fairly easy cultivation and is a summer grower. A good sharp soil mix and plenty of sunshine will ensure success. It will grow from April to October and will flower in August and September. Allow to dry out completely in winter when leaves will be renewed. Do not allow winter temperatures to fall below 48°F. Water sparingly in summer when plants are in full growth.

Dinteranthus are not too plentiful in our collections although they are not difficult to grow in a warm greenhouse with careful watering. Propagation can be from detached heads if there are any but principally from seeds. These are plentiful in dealer lists and all six species can usually be found. Wild, collected capsules, produce a glut of difficult to count seeds which sometimes defy all attempts to germinate them. Alternatively, Lady Luck may be on your side if your conditions are right for *Dinteranthus* at the time of sowing. Sown seeds need to be subjected to a considerable amount of sunlight.

Difficulty in germinating these seeds might be overcome by noting that it has been discovered the seeds require a temperature of 150°F (65C) for a minimum period of 60 to 100 hours for optimum germination. To provide conditions in cultivation as near to this as possible, proceed as follows. Fill the pot to within ¼" of the rim with sterilized gritty compost and gently firm down level. Lightly and evenly cover the surface with coarse sand or grit, level and gently firm down. Sow the seeds lightly on the surface making sure the seeds are not covered by the grit. Cut a piece of plain glass smaller than the soil surface area and place directly on top of the sown seeds. Soak the pot in a diluted fungicide mixture until the seeds and grit under the glass are wet. Allow 24 hours for the seeds to take up this moisture. Place in full sun for at least 10 days or 100 hours of sunshine and keep seeds moist by watering regularly from below. After that place pots in light shade. Seeds should then germinate in two to three weeks from sowing. After germination, raise the glass 2mm each day, carefully replant any seedlings that stick to the glass. Continue to grow on using a suitable fungicide mixture to prevent 'damping off'.

Mesembryanthemaceae*Faucaria tigrina* (Haw) Schwant.

Surface of this plant is greyish-green and covered with numerous conspicuous white dots. Margins have 9-10 recurved teeth, tops of which are continued into long bristles. Flowers, which often occur two together, are about 2" across and golden yellow. MW

The name of this genus comes from the Latin *faux* = jaw and *faucaria* = a collection of jaws. *Faucaria* was described by Prof.

Dr. Gustav Schwantes in 1925. There are about 33 recognized species and *F. tigrina* is the Type Species. The genus are all yellow flowered but there are exceptions to every rule and *F. candida*, scarce in our collections, is white flowered. Distribution is in the Eastern Cape Province in the Albany Division in R.S. Africa.

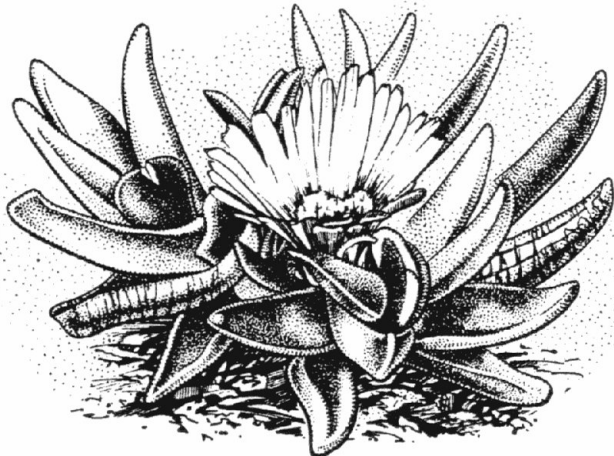
F. tigrina is a small rosette forming plant with highly succulent leaves and fleshy, napiform roots. Rosettes will multiply in age and will eventually form mats. The leaves are greyish green with numerous white dots, shortish pointed and with toothed edges. Flower is large and showy to 5cm across and a bright golden yellow. The seeds are much larger than most *Mesemb*s, brown and flattish.

All *Faucaria* are summer and autumn growers, May to November, with flowers appearing from August to November, sometimes two to a stem. This species, of simple cultivation, has been popular with collectors for many years and comes easily from seeds. Detached heads root easily in good gritty soil and with lots of sunshine. It is popular with collectors because of, at times, its habit of prolific offsetting and gorgeous buttercup yellow flowers in autumn. Dry off in winter when temperatures should not fall below 48°F. If you occasionally detach rosettes and give them to your friends, your plants will be larger than they ought to be in a small greenhouse!

Glottiphyllum arrectum - N.E. Br.

Golden yellow flowers.

*Glottiphyllum*s are very succulent plants needing great care in watering. Growing period is very short in spring with a long resting period during which they should be kept quite dry. A cold greenhouse in winter is suitable. Propagation is by cuttings. These plants are self sterile. True seed is obtained only by cross-pollinating plants from different clones of the species. MW



Mesembryanthemaceae

Glottiphyllum arrectum cont ..

This generic name comes from the Greek glotha = tongue and phyllon = leaf and was described in the Gardeners' Chronicle in 1921.

There are about 60 species many of which are in cultivation. Habitat is in Sevenfontein in the Swellendam Division of Cape Province, R.S.A.

G. arrectum is a small, low growing plant and is very succulent. It branches at ground level. Leaves are fresh green 4cm to 5cm long and about 8mm across and thick, finger-like and rounded and keeled on the underside.

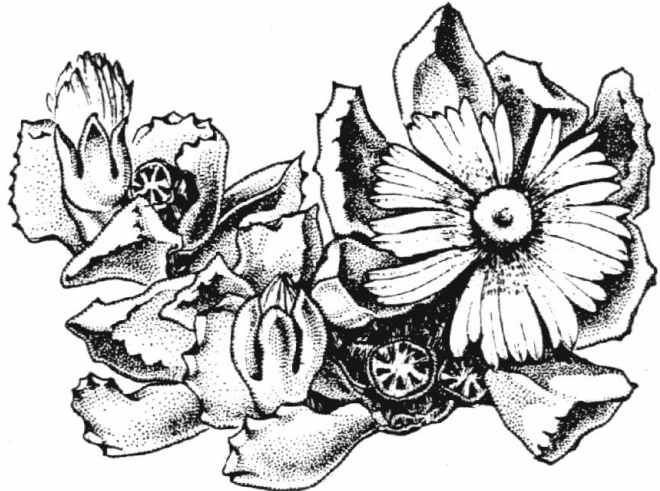
Large golden yellow flowers are 4cm across and seeds are small and ovoid, brownish and have a small pip at one end when seen magnified.

All the *Glottiphyllums* are summer growers and of easy culture providing you do not overwater them. They will grow from April to November and produce showy flowers from September until the end of their season. As *Glottiphyllums* are a very succulent genus, they should be potted in a gritty soil mix and watered sparingly during their growing season. Overwatering will cause the leaves to split and crack and will be very unsightly when your friends visit. If bedded out they do best in poor and fairly well drained, dry soils. If not, plants will run riot and have fat, splitting leaves and be far out of character for the species. However, with proper care they make good ground cover plants. Rest dry in winter and keep them around a 48°F minimum temperature at that time.

Propagation is from seeds which are fairly readily available. They germinate and grow well in summer. Detached stems will root easily and do well for you in summer in a bright, sunny location. Rather larger than some *Mesembs*, you will need space to grow these ground huggers with finger-like leaves. They are popular with beginners, the large yellow blooms in autumn being particularly appreciated.

Juttadinteria elizae

Juttadinterias are extremely succulent, clump-forming plants. Flowers are white, lilac-red or violet. Plants bloom in August. They need warm greenhouse care. Propagation by seed and cuttings. *Juttadinteria elizae* has white flowers.MW



Mesembryanthemaceae

Juttadinteria elizae cont ..

This genus was named for the late Mrs. Jutta Dinter in 1927 by Prof. Dr. Gustav Schwantes. There are around 12 known species and they are mostly shrubby and small, often with trailing stems of much crowded succulent leaves. Habitat is around Tirasberg, North of Aus, in South West Namibia.

J. elizae is a branched, shrubby Mesemb with short, decumbent stems and with crowded very succulent leaves with margins and keel dentate. The leaves are a bluish grey and lightly dotted. White flowers have a very short stalk. Seeds are small and brownish to 1mm long.

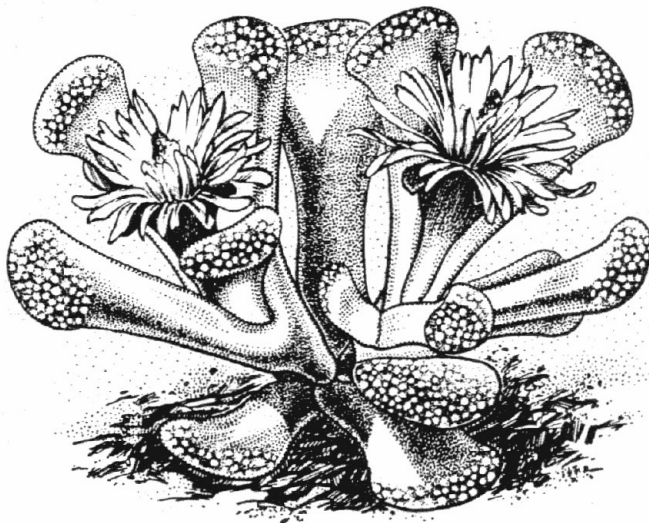
In cultivation this plant will grow from midsummer to the end of the year when flowers are produced in November and December. It is comparatively easy to grow in a gritty mix in full sun. The densely leaf covered stems grow slowly and will flower at the end of the year in cultivation.

Propagation is primarily from seeds which are sometimes available. They germinate well and are easy to grow on. Compactly formed stems may be detached in spring, dried off and then rooted in summer to make new plants. Don't be put off by the long generic name. At year's end when there is very little color emanating from your cacti, the contrasting white flowers of this plant against the pastel blue leaves - will delight you!

Rhinephyllum broomii,

L. Bol.

Rhinephyllums are short-stemmed succulents with flowers ranging from golden-yellow, yellow, yellowish white or white. Flowers of *broomii* are ½" yellow. Note also that flowers are nocturnal. Growing time is in summer when they need bright growing conditions. Greenhouse is best but if kept outside in summer. Protect from rain. In winter keep dry around 45-50F—no higher. Readily propagated from seeds and cuttings. MW



Mesembryanthemaceae

Rhinephyllum broomii cont ..

The generic name is derived from the Greek rhine = file, an allusion to the roughness of the leaves caused by hard, white tubercles at the tips and phyllum = leaf. The genus was first described by Dr. N.E. Brown in 1927, in the Gardeners' Chronicle.

R. broomii is a short stemmed, compact, shrubby succulent plant. The leaves are spatulate and minutely tubercled at their tips.

Flowers are nocturnal and 1 to 2cm across, light yellow. Many small, brownish seeds are produced from a capsule. Highly magnified they appear slightly compressed.

Titanopsis calcarea (Marl.) Schwant.

Flowers golden yellow to almost orange. They grow in summer.
Propagation from seed or cuttings.mw

The generic name is from the Greek titanos = chalk and opsis = appearance and was first described by Prof.; Dr. Gustav Schwantes in 1926.

There are six species in the genus, all small and attractive and popular in cultivation. They are:

T. calcarea, *T. fulleri*, *T. hugo-schlechteri*, *T. leuderitzii*, *T. primosii* and *T. schwantesii*. Type species habitat is around Prieska, West Griqualand in Cape Province, R.S.A.

This is a short stemmed very succulent plant with a firm, fleshy rootstock, forming dense mats with age. Leaves are spatulate with somewhat truncate tips with greyish white tubercles.

Flowers are golden yellow to orange and to 2cm across. Seeds are small and many are produced in the capsule. Under magnification they appear globose and are minutely tuberculate.

This species is easy to cultivate and is truly a 'mimicry' plant. *Titanopsis* cannot be mistaken for anything else. Only *Aloinopsis* and *Nananthus* bear a superficial resemblance. The plants are summer and autumn growers, commencing growth in July. Flowers appear the last two months of the year.

Give good light levels and a warm greenhouse. Rest dry in winter. Do not allow temperatures to fall below 48°F at that time.



Mesembryanthemaceae

Titanopsis calcarea cont ..

Propagation from seeds which are easy to raise during summer months and which are readily available. Cuttings, which are not very plentiful, will root easily in the longer days of summer.

All *Titanopsis* are popular with *Mesemb* growers but perhaps out of the six species, *T. hugo-schlechteri* is the favorite one with its wonderful and expensive looking brown

hue. Seeds of this species are often a little more difficult to obtain due to its popularity and reputation. Grown hard, plants will remain small and beautiful.



Trichodiadema

densum, (Haw) Schwant

Crimson flowers but they can range from white to yellow or red on other species. Flowering from spring to late fall then a cold resting period should be given. Propagation by seed and cuttings.mw

This name comes from the Greek trix = hair and diadem = crown and was described by Dr. H. M. Louisa Bolus in 1926.

The genus consists of about 30 mostly woody, small shrubs. Some will adapt to half hardy bonsai culture. Flowers are quite large being 4cm to 5cm across. Seeds are small, pear shaped and minutely warty.

All *Trichodiademas* are of easy culture in gritty soil. They will grow all year except for the two shortest day months of winter. Plants in a light situation will flower freely from February to September. Watering with care can be done most of the year. However, do not allow winter temps to fall below 48F.

Propagation is far easier from seeds than from hard, woody cuttings. Seeds of *T. densum* are usually available and will germinate and grow on well in summer, the red flowers being quite delightful at that time. This plant is popular with collectors because of the flowers, and especially because of the caudex which is below ground.

If you have plants of different clones flowering together, plants will eventually drop seeds from their capsules and you will eventually have more little plants than you know what to do with.

Summing Up

Mesembs are from very hot, dry, sunny deserts and are what you might call 'Children of the Sun'. They are not really at their best grown under lights but if you must grow under lights those lights must be of really excellent quality - and replaced with new lights when the intensity wanes - which happens with fluorescent tubes of any kind.

It is important to remember that Mesembs need excellent drainage, especially for the very succulent ones. Because in their native habitat very little plant food is available to them, it is best to avoid the use of fertilizers which can cause the plants to develop abnormal growth and become susceptible to rot. A *little* leafmold in a very sandy mix is all they need. Some growers say you can add a little bonemeal if leafmold is not available. ☆

Growing and flowering times given refer only to plants grown in the Northern Hemisphere. The beautiful drawings by Carla Wolters were commissioned by Doug Rowland and we thank him for his generosity in allowing us to use them.

There are differing opinions on the subject of fertilizing *Mesembs*. Some growers are quite firm in their belief that no fertilizers should be applied because fertilizers would cause the plants to develop abnormal growth and become susceptible to rot. They point out that in the native habitat very little food is available to *Mesembs*. On the other hand, **Steven Brack**, a recognized authority on the subject, says he feeds them about twice a year. **Isabelle McDermid**, also a very knowledgeable grower, says she fertilizes *Mesembs* even more often than Steven Brack does but never during dormancy. Isabelle explains that years ago in one of her 'climate' studies, she read something to the effect that the so-called poor soils in arid regions were actually rich in minerals and other nutrients. This is because the very scant rainfalls do not leach away these substances as happens in areas of heavy rainfall. When it does rain, these desert plants get a rich feast! This is certainly an interesting topic which invites discussion in future Digest issues. mw



Cartoon:
Dan Leavitt
Seattle WA
From
The Point
Newsletter

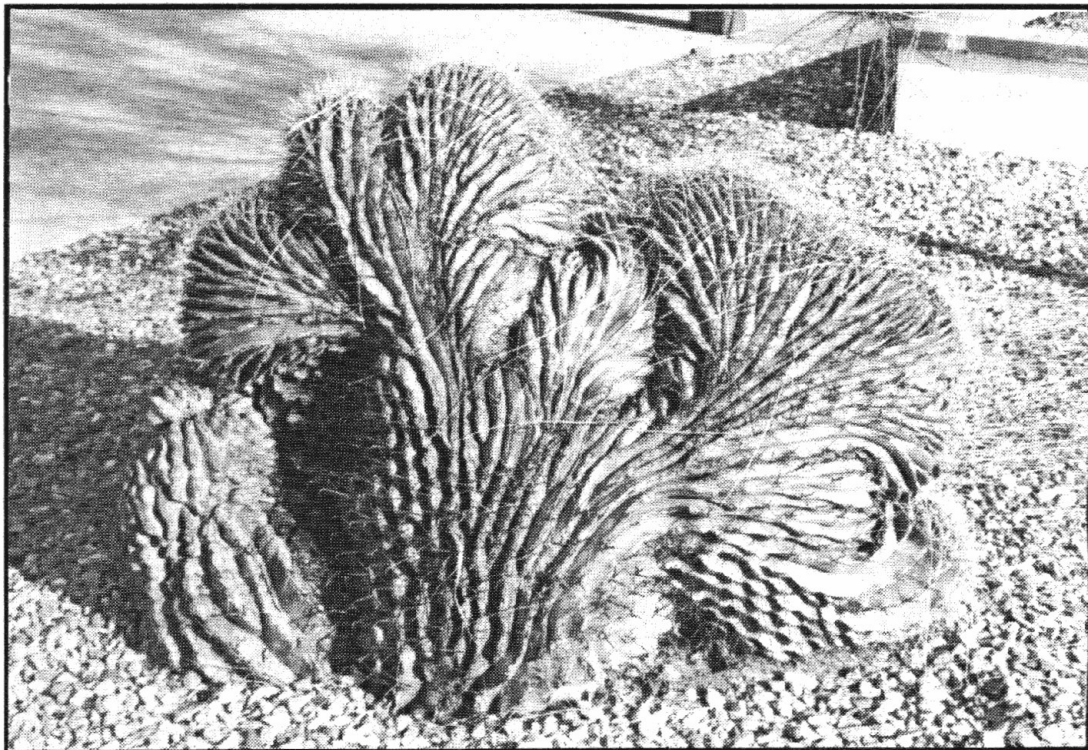


FEROCACTUS ACANTHODES* (Lem) Br & Rose (Cover Photo)*Doug Rowland, England**

Of the four species of *Ferocactus* found in the American Southwest, (*F. covillei*, *F. acanthodes*, *F. wislizenii* and *F. viridescens*), *F. acanthodes* is the most common and widespread. In the species the body is stout and globose then columnar in age reaching three to nine feet (1m to 3m) tall. They are mostly solitary plants, stems 12" to 15" diameter with about 30 ribs. Spines are whitish pink or light red, becoming grey in age. There are about 13 radial spines and four centrals, the lower one gently curved but never hooked, occasionally flattened and sometimes tortuous. Plants of the species have a ragged look about them due to many of the spines being of uneven length.

Bell shaped flowers are yellow to orange, 1½ to 2" across and begin to appear in April. Fruits are smooth and yellowish green, some persisting over winter until springtime when they eventually dehisce and are taken by ants and other insects, desert birds and rodents. A few fall down between the ribs to germinate later in a shady spot when the rain comes along. Berries are dry and easy to collect from mature plants. The red spines can be shown to advantage on sunny days by lightly spraying them with clean water which brings them up to a gorgeous, shining, pinky red or straw yellow color and ready for a photograph.

Occasionally cristate plants occur in *Ferocactus* (see photo below by Vivi Rowland of *F. acanthodes cristata*) but they are never very plentiful.



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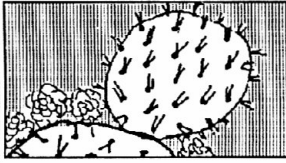
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THE AMATEURS' DIGEST

CACTI - OTHER SUCCULENTS - CAUDEX PLANTS

Written and Illustrated
By Lovers of Succulent Plants

Marina Welham, Editor
8591 Lochside Drive
Sidney, BC V8L 1M5 Canada

April 26, 1994

Dear Esther,

Letters like yours which are soooooo enthusiastic really make my day. Your first issue is enclosed as well as the special editions you wanted.

The good news is you overpaid on your 1993 special edition. You paid \$8.00 instead of \$6.00. I hope it's okay if I credit your account with \$2.00. Haven't got any American money on hand and it's an hour to the bank to get some.

I'm working on another special edition for 1995. Wait until you see the show-off caudex plants belonging to one of our members. Wish I could extend the 'caudex' section for those of you who love these plants but a recent survey of our membership showed our ratio of C&S and caudex is about right at the moment. Fact is, however, there isn't another publication featuring the fat plants so I guess our caudex section is better than nothing at all.

Remember we have free ads in swap and shop and if I can be of help in any way, don't hesitate to write to me. And try to get involved in future issues will you? I need people with your enthusiasm to participate.

Take care now and keep in touch.

Sincerely,



THE AMATEURS' DIGEST

CACTI - OTHER SUCCULENTS - CAUDEX PLANTS

Written and Illustrated
By Lovers of Succulent Plants

This is Your Invitation to Join Our World Wide Membership



Astrophytum asterias

Plants & Photo: Tom Popson, Chicago, Illinois

THE AMATEURS' DIGEST

Cacti-Other Succulents-Caudex Plants

Written and Illustrated By Lovers of Succulent Plants
Informal-Informative-Affordable

Hobbyists from beginners to experts share information, plants, seeds and make contacts with other collectors world wide.

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AND MAKE THIS YOUR DIGEST TOO !!**

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Marina Welham, Editor
8591 Lochside Drive,
Sidney, British Columbia
V8L 1M5, Canada

Our Digest reaches hobbyists in ...

Canada - Alberta, British Columbia, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, Ontario, Quebec, Saskatchewan and the North West Territories.

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THE AMATEURS' DIGEST

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NEW DIGEST SEED EXCHANGE SERVICE

➤ Available ONLY to individually paid subscribers (no fee)

Send Seed Donations and Orders to: Allan Daku, Seed Exchange Coordinator, P.O.Box 68, Parkside, Saskatchewan, SOJ 2A0, Canada. As with all 'beginnings' our system will be simple. We have some seeds on hand but need donations to build up an inventory. We will publish lists twice a year. Cost to you covers actual cost of packaging and postage. If you order and we run short we will keep your order to fill as more seeds become available. Or a refund will be made at some point. Do not expect to be notified of short supplies. We cannot at the moment give credit for donated seeds by giving seeds as an exchange. *The Amateurs' Digest* cannot be responsible for viability of seed, purity of seed or even correct identification. We rely on the integrity of our members to make every effort to provide seed that is true, fresh and properly identified. If you send seed with short viability, please note that fact on the seed package. **When you order 'print' your name and address clearly.** List seeds you want and a few substitutes you will accept. Include payment as follows: 1-9 types of seed: 50 cents per type of seed (could be more for choice seeds) plus \$1.50 P&P. Overseas \$3.00 P&P. 10 types of seed and more: same price per type of seed but please add double the postage. Seeds available will periodically be listed in your Digest issues.

General Inquiries? Write to Allan but **make sure you include return postage or IRC's** if you expect him to reply.

Want a Free Digest Renewal? Or money to buy a new plant?

Earn \$2.00 for each new person who joins our membership on your recommendation. I'll keep a record in your account and at the end of the year you will find out if you earned enough to pay for a free renewal, money to buy a new plant .. or take the half a million in cash!! This offer is good through Volume 6.

If you would like to help promote our publication to earn money for your club, society, etc. write to me and I can supply you with promotional material giving all details about our Digest. Just let me know how many flyers you think you would need.

The purpose of our Digest is to provide hobbyists everywhere with a way to share information/plants/seeds, etc. and to make new friendships in our hobby.

All work and material included in Digest issues and other Digest publications is totally voluntary. Fees paid and advertising payments defray costs to produce the Digest and pay management expenses and where possible help us to grow. Issues are supplied to members at cost price.

THE AMATEURS' DIGEST - Publications

THE AMATEURS' DIGEST

1994 Special Edition (many photos)

Contents

- Seed Raising
- Propagation
- Fertilizing
- Grafting (Cacti and the Other Succulents)
- Feature Article on Mesembs
- Report on a Very Unique Aloe
- Bromeliads including Succulent Types
- Lots of Excellent Photos
- Drawings by Carla Wolters, Holland

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THE AMATEURS' DIGEST

1993 Special Edition

Canada & US \$6.00 (US in US\$)

Other \$.800 US\$

mailed with regular issues

add \$1.50 for first class mail

67 pages spiral-bound (many photos)

Covers cacti-other succulents and caudex plants

This special issue now in short supply. If you order and sold out your cheque will be returned with your next issue.

Growing Under Lights

By: Al Henderson, Mackenzie, BC

22 Page illustrated booklet

\$3.50 including postage

For the convenience of members, this is a photo-copy (with cardstock cover) of six articles printed in early issues of the Digest plus a 7th article not previously published. Al Henderson tells you everything you need to know about setting up a growroom/area to grow your plants under lights. Metal Halide information included.

➤ CAUDEX Booklets (2)

FOR NEWER MEMBERS WHO ARE CAUDEX LOVERS

NEW - We have a large number of newer members whose main interest is in caudiciform and pachycaul succulents. For them to have access to caudex pages in earlier issues, they are looking at paying \$30.00 to \$40.00 to

purchase all those back issues. For them and for others who may wish to have a re-paged, newly indexed, quick reference to caudex items in Volumes 3 and 4, two booklets have been prepared containing copies of all caudex pages which appeared in Volume 3 (when we started the new feature) and through to the end of Volume 4. Photographs are not as good as the originals but where originals were excellent, copies are good. It was decided not worth the extra expense of having more original photos made which would have considerably increased the cost of the booklets. So, if you want them, here are the details:

Caudex Booklets 1 and 2 (not sold separately) - 90 pages in total - cardstock cover - Canada \$11.50 (for both) (incl. \$1.50 postage). USA \$11.50 (incl. \$1.50 postage (US\$) Other \$11.50 (US\$)(incl. plus \$2.50 postage) - overseas air mail add another \$1.50. I am not going to order too many of these until I see how many are interested so allow up to a month to fill your orders. Anticipating your next question - will the same be done for all volumes? I don't know. Depends on the number of orders for these two booklets.

➤ **Index of Cactus Illustrations by John Evanich** "Updated" through 1992. Now the entire book (published in 1989) including full update through 1992 is available on five diskettes. Please specify 5 1/4" or 3 1/2" diskettes. Set of five diskettes US\$25.00 incl P&H. Overseas add US\$3.00. Send payment to **The Amateurs' Digest** (exclusive distributor), 8591 Lochside Drive, Sidney, BC V8L 1M5, Canada.