DISA CULTURE

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THE CULTURAL INFORMATION in this article relates to the evergreen *Disa* species (particularly *Disa aurata*, *Disa cardinalis*, *Disa racemosa*, *Disa tripetaloides*, and *Disa uniflora*) and their hybrids. These are the disas most commonly encountered in cultivation.

Media

The potting medium should hold plenty of moisture, drain well, allow free access of air to the roots, and be mildly acidic. No part of the medium should ever dry out. Disa growers have had success with a variety of media, but all of them need to meet these basic requirements.

Long-fibered sphagnum moss (dead or alive) has all the necessary properties. Not surprisingly, disas love it; in nature, they can often be found growing in it. However, it does have some major drawbacks. It is a tedious job at repotting time trying to tease out the moss strands from the brittle disa roots. Also, live sphagnum moss may grow so fast that it overwhelms small disa plants, and the moss can be easily killed by even small concentrations of fertilizer and other salts.

Supersphag is a New Zealand product made from cleaned, chopped, dried, and compressed sphagnum moss. When used in conjunction with coarse horticultural perlite (1:1), it creates an excellent medium without the problem of long fibers that get entangled with the disa roots. By chopping up regular sphagnum into small bits, one can create a useful substitute for Supersphag.

Growers in South Africa have had success using coarse silica grit, with particle size in the 1 to 3 mm range. For whatever reason, this medium has not caught on elsewhere. Builders' sand and beach sand are not suitable.

Peat moss mixed with horticultural perlite has also worked well for some growers, though over time, the extreme acidity of the peat and its tendency to pack down and become waterlogged can be a problem. Small coconut husk chunks and composted pine bark, either on their own or in mixtures, have recently been reported to produce excellent results.

Given that the surface of the medium will always be moist, there is a potential problem with the growth of algae. Sphagnum moss is particularly susceptible. The basic math is simple: light + moisture + nutrients = algae. There are ways to mitigate this. A top-dressing of ¼ inch crushed gravel or pea gravel will ensure that light does not reach the damp surface of the growing medium itself. Fertilizing from below (hydroculture) minimizes the amount of nutrients reaching the top of the medium. Regular flushing from above with pure water also helps, whether using hydroculture or fertilizing by watering from above.

Containers

Mature disas will do well in plastic pots that are 3.25 inches (8 cm) square and about 4 inches (10 cm) deep. Vigorous clones and specimen plants will appreciate being in bigger pots. Terra cotta pots also work well. The pots should allow excellent drainage. Disas will often send roots or even shoots out through the drainage holes, but that is a small price to pay for having a healthy and happy plant.

Seedlings growing in long-fibered sphagnum moss.

Seedlings growing in fine composted pine bark. They have put on more growth than their counterparts in sphagnum moss.

One-year old seedlings in a community pot. The potting medium consists of coconut husk chips with peat and Perlite.

Healthy roots of a plant growing in 1:1 coconut husk chips and Perlite. The top layer is a mix of coconut husk and peat.

Light

In nature, disas grow in dappled sunlight. The surrounding vegetation may filter some of the light, but the plants do see a significant amount of the sun. The light requirements can be met in cultivation by growing the plants in a sunny spot, with 50% shade cloth. Plants grown in high latitudes with short, dark winter days benefit greatly from supplemental artificial light at that time of year (October through February in the Northern Hemisphere).

Temperature

Disas are creatures of temperate, breezy mountainsides, not steamy jungles. They don't tolerate high temperatures, especially in the root zone. An ideal temperature range for them is 10 to 24°C (50 to 75°F). They can tolerate air temperatures that are higher than the ideal range for short periods.

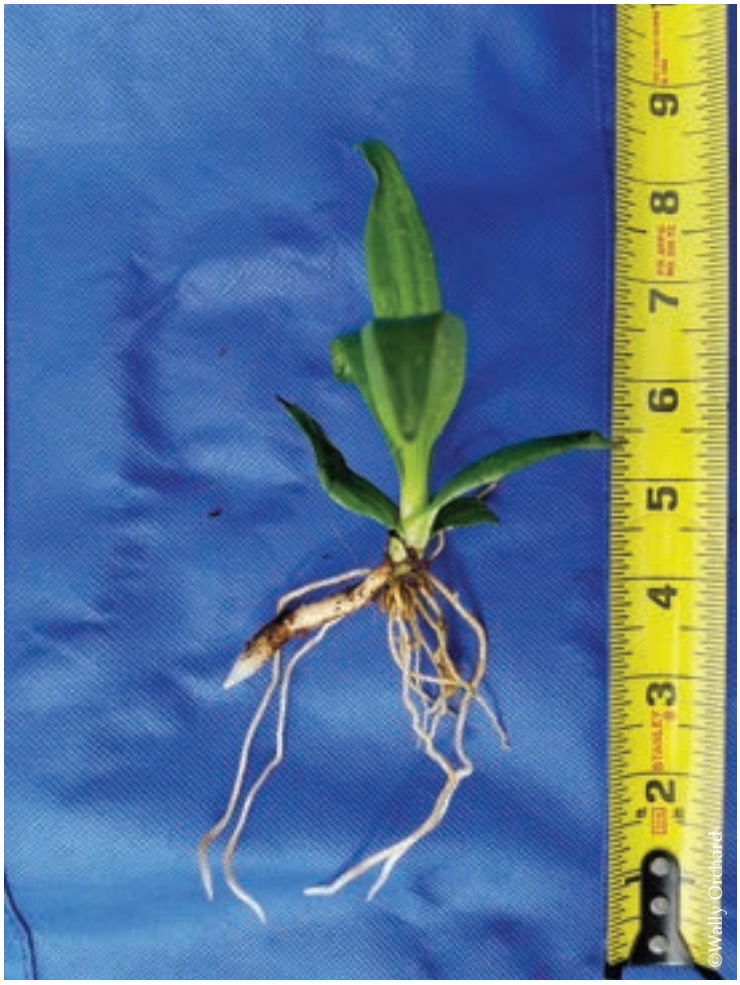
Humidity and Air Movement

The evergreen disas in nature grow in close association with water. They can be found on the faces of waterfalls and drips or along the banks of mountain streams, often actually dabbling their toes in the water. This ensures that there is significant humidity around the plants, even during the hot and dry summer months of the Western Cape in South Africa. Compared with most other orchids, disas have thin, soft leaves, so hot, dry air can be very damaging. For disas in cultivation, a relative humidity of between 50 and 80% is recommended. Higher humidity will cause the pollen to go moldy, ruining the flowers, and shortening their life. Good air movement is also important. This is easily achievable if they are grown outdoors. Forced air circulation is advised for indoor disas.

Water

Good quality water is essential for success with disas. Rainwater is ideal; some streams, rivers, lakes, and even boreholes (wells) may also be acceptable. An electrical conductivity (EC) of less than 50 μS/cm (equivalent to total dissolved solids or TDS of about 35 ppm) is best. Municipal water is rarely acceptable, owing to chlorination. Lacking a good natural source of water, distilled, deionized, or reverse osmosis (RO) water should be used.

The pH of water from different sources can vary widely. In nature, disas experience a water pH of around five or less due to the humic substances present. Higher pH water can be successfully used on disas, particularly in conjunction with a more acidic growing medium.



A vigorous *Disa* clone may develop a tuber within a year from seed and bloom the following year.

Watering and fertilizing can be done from above. In that case, the pots need to be thoroughly flushed with pure water between fertilizer applications. Hydroponic methods (either continuous flow or flood and drain) have also been used with great success. For small collections, feeding and watering from below can be achieved by standing the pots in shallow saucers with a little water.

For anyone wanting to grow more than a couple of disas, I strongly recommend a conductivity meter to test water quality and fertilizer concentrations. Get one that reads from 0 to 1000 ppm.

Fertilizer

The best way to fertilize disas is to use a dilute solution of a fully soluble fertilizer containing trace elements. Calcium and magnesium are macronutrients that are not present in most fertilizers, even those with trace elements. Therefore, it may be advisable to provide these two elements separately, as calcium nitrate and magnesium sulfate (Epsom salts). Either a high-nitrogen (30-10-10) or a balanced fertilizer (18-18-18) will work well. When buds appear in the spring, a low-nitrogen fertilizer such as 6-20-20 can be used to stimulate flower production. When flowers open, cut back on fertilizer, and stop feeding entirely when the flowering stems start dying back. Once the plants are repotted in autumn, fertilizer application can be resumed.

It is important to use very low fertilizer concentrations for disas. Cywes et al. suggest a range of up to 300 µS/cm (200 ppm). During fall and winter, when growth is very slow, use even less fertilizer.

Disas also respond well to foliar feeding. It may be convenient to provide calcium and magnesium supplemental feeding in this way. Foliar feeding at around 220 µS/cm (150 ppm) will not burn the disa leaves.

Urea in a fertilizer does not contribute to the measured EC or TDS. So, if a large part of the nitrogen in a formulation is supplied by urea, concentration measurements based on conductivity readings will be lower. If you do not have a meter for measuring fertilizer concentrations, try starting with ¼ teaspoon of fertilizer in 1 US gallon (4 liters) of water. This ratio will give a TDS of around 200 ppm. From there, you can increase or decrease the TDS to find what works best for you.

Whatever method one uses to deliver the fertilizer, it is crucial to flush out the pots with water from above regularly. Accumulation of salts in the medium must be avoided at all costs.

Growing Indoors

While it is easy enough to provide good growing conditions for disas in a greenhouse, it is much trickier to succeed in the confines of your home. A typical indoor living environment is unlikely to have enough light, humidity, and air movement. Disas need good light to develop their full-color potential.

That said, excellent results have been obtained when plants are grown in the basement of a house. Here they can be given intense, artificial light, and the humidity can also be kept high enough for them. These plants grow well even through the winter months. Many go from seed to flowering much quicker than their counterparts that experience more natural seasonal variations in light and temperature.

Repotting

Most growers try to repot in the fall, though late winter has also been suggested as a good time. For plants grown in small pots, up to 4 inches (10 cm), annual repotting is recommended. For plants in bigger containers, less frequent repotting may be acceptable. If at any time a plant is looking distressed, it might need repotting. Disa roots are extremely brittle, and the tubers can easily break off with careless handling. Try to tease or rinse out the dead and dying roots and growths, leaving only healthy, new plant material behind. Old potting mix can be removed while "floating" the plant in a bucket of water, cradled in your hands; this helps support the plant and minimizes root breakage while you tease out the old medium.

Although regular repotting is essential for disas, it gives them a temporary setback. If you find you need to repot more than once a year, owing to the growth of

A disa collection in full bloom makes for a colorful spectacle.

algae or any other problem, your plants are unlikely to reach their full potential.

Pests and Diseases

Disas, with their tender leaves, are fair game for a variety of common pests. Aphids, thrips, fungus gnats, slugs, snails, and earwigs, among others, may all enjoy dining on disas. In choosing an insecticide to use on your disas, avoid solvent-based formulations; wettable powders are preferred. Sticky insect traps can give a good idea of the prevalence of insects in your collection, and carnivorous plants such as droseras and pinguiculas can help control their numbers while growing as companions. Disas are also susceptible to some diseases. Occasionally, all the roots will rot off just below the surface of the potting medium. This seems to be a bigger problem when algae are present on the medium surface. It is probably a good idea to apply a fungicide to the plants regularly. Various fungicides have been used successfully; again, wettable powders are preferred.

Newly deflasked seedlings often die through damping off. The stem turns to mush at the surface of the medium, and the plant cannot be saved. Any damage done to the plants during deflasking will only exacerbate this problem.

Starting from Seed

Disas are unusual in the orchid world in that their seed will germinate without the need for flasking on nutrient agar. Seed should be fresh; it loses viability within a few months. It may be sown on a bed of boiled sphagnum moss or peat moss and, to preserve humidity, the pot or flat should have a plastic covering. Germination is rapid. When the seedlings have leaves that are a few mm in length, they can be moved out into community pots. Again, it is important to conserve humidity levels.

While it is undoubtedly rewarding to grow plants this way from seed to maturity, much quicker results can be obtained with conventional flasking. One quarter strength Murashige and Skoog medium works well.

With good management, plantlets can be replated from the mother flasks after two to three months and be ready for deflasking in six to eight months.✾

Reference

"A Disa Companion" by Eric Harley, Sid Cywes and Peter Linder. Available as a Kindle file from Amazon.

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About the Author

Walter Orchard hails originally from South Africa. He became interested in disas through his father, who grew them successfully in his retirement. He and his wife Christine now live in Yachats on the central Oregon coast where the local climate and water supply are ideal for disa growing. Walter's disa collection is hosted by Jim Rassmann, in nearby Florence. When not repotting disas he can be found pulling invasive weeds, jogging around Yachats, playing bridge, or baking artisan bread.

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