

DISA CULTURE

This deals with the culture of the better known, more popular, evergreen Disas from the winter rainfall area around Cape Town, South Africa. The main species of interest are *Disa uniflora*, *D. racemosa*, *D. tripetaloides*, *D. aurata*, *D. cardinalis*, *D. venosa* and *D. caulescens*. These are all terrestrial orchids which grow in association with water. Many other Disas are known which grow in quite different environments and have different cultural requirements.

Media

Disas need excellent drainage, a neutral to slightly acidic pH and a constantly moist (but not waterlogged), aerated medium. There are different ways of achieving such conditions. Long fibered sphagnum moss is excellent, as is Supersphag, consisting of sphagnum fines. These should be mixed 1:1 or 1:2 with coarse Perlite or shredded Styrofoam to keep the medium buoyant. For anyone just growing a few disa plants, I recommend these sphagnum mixes. They work with top-watering or hydroculture (bottom watering, preferred). Live sphagnum moss provides outstanding results if you can keep the moss healthy. Coarse quartz grit (about one eighth inch size), mixed with peat or fern fiber works well for some growers. A mix of peat:perlite in a 60:40 proportion also has some adherents. Algal growth on the surface can be reduced with a layer of small pebbles. Experiment with media to find the one which suits your growing conditions the best. If a plant does not thrive, it may be time to try a slightly different medium. The best medium may also depend on the water supply being used. For example, if the water has a high pH, a more acidic medium may be called for.

Pots

For mature plants, 3 to 4 inch (8 to 10 cm) square plastic pots are fine; for seedlings, smaller pots may be ok. Pots should be reasonably deep to conserve moisture and allow room for the roots and tuber.

Water quality and watering

Water quality is absolutely critical in Disa culture. The water should have a low concentration of dissolved mineral salts and should be low in chloride and fluoride. Some tap water is ok, but many supplies are not. Rainwater or reverse osmosis water is recommended. However, even rainwater can pick up unwelcome salts off a roof, especially the first rain coming off the roof, and if the tiles are of cement. A slightly acidic pH (5 to 7) is preferred. A dissolved solids tester, reading in ppm (parts per million) or $\mu\text{S}/\text{cm}$ (microsiemens per cm) is essential for any serious Disa grower. Water with a dissolved solids reading of less than 50 ppm (75 $\mu\text{S}/\text{cm}$) is preferred.

Disas are different from many other orchids – **never let the medium dry out! (Please make sure you understand the meaning of the word NEVER!)** Adjust your watering frequency to meet this requirement, which may mean daily watering in extreme cases. But also try to avoid a waterlogged condition. Hydroponic systems, either continuous flow or ebb and flow, give excellent growth but are not essential. With a water reservoir, pump, timer and other accessories it is fairly easy to set up an automated ebb and flow watering system. Watering from above also works well. As with most orchids, watering is best done early in the day so that the leaves can dry out. Disas succumb rapidly when mineral salts accumulate in the medium; thorough watering from above will help to flush away unwelcome residues. It is important to cut back severely on watering during winter, otherwise problems with fungal rot can be expected.

Fertilizer

Use **very** dilute (about 1/4 to 1/10th strength), balanced fertilizer containing all trace elements every week or two during the spring to fall growth phase. Cut back on fertilizer during winter. Moderate to high nitrogen is recommended; mixtures like 10:5:5, 30:10:10, 20:20:20 and similar have all been used by successful growers. Here again, a dissolved solids tester is a great investment. Ideally, fertilizer solutions should be kept below about 200 ppm (TDS reading), or an EC value of 300 $\mu\text{S}/\text{cm}$. Occasional supplements of trace elements (e.g. kelp emulsion) may be beneficial. If you have a lot of algal growth on the surface of the pots, it is a sign of too much fertilizer. Flush the pots with water to correct this.

Temperature and humidity

Disas like plenty of air movement and relatively cool temperatures, especially in their root zones. They are stressed when the temperature goes above 80°F (27°C); also the humidity should ideally be kept above 50%, especially in hot weather. Shade netting (about 50%) in summer helps keep the temperature down and humidity up. A sharp frost will

damage the leaves, and a hard, extended freeze is likely to kill the plants, but they will tolerate winter temperatures just slightly above freezing.

Lighting

During the growing season bright, filtered sunlight is important for Disas. Morning sun is preferable to afternoon sun. Poor light quality leads to inferior color of the blooms.

Repotting

Mature Disas need annual repotting since the old plant, tuber and roots die and rot. Repotting may be done in the fall, after flowering, or whenever there are indications of root problems. Healthy roots are pale and very brittle; dead roots are brown and soggy. Wash the plant thoroughly and soak in fungicide solution before repotting it. Repotting at the end of winter has also been recommended, in order to give the small new growths from the previous season more time to mature.

Pests and diseases

Disas are susceptible a virulent fungal rot, in which the whole plant and root system decomposes into a soggy black pulp. Correct culture and a fresh potting medium reduce the chances of this, but routine preventative fungicide application is recommended. Among the fungicides which I have used are Aliette WP, Subdue, Clearys 3336 WP, Captan WP and Rootshield, a biological “fungicide”. Bacterial soft rot has been treated with Physan 20, with great care. Insect pests in North America include aphids (Malathion, Sevin, Orthene), fungus gnats, thrips (Cygon, Lebaycid), slugs and earwigs, which eat the flowers at night. Regular removal of dead and dying leaves reduces the risk of disease. As a rule, pesticides in wettable powder form are preferred to liquids which may contain damaging solvents. Pesticides and fungicides should be rotated to avoid development of resistant strains.

Growth cycle

Winter. Plants show little or no green growth during the coldest months, but mature plants can have significant underground activity in the way of developing tubers and shoots.

Spring. With the advent of warmer weather and longer days, leaf growth begins to accelerate and spikes may start developing. I see stirrings in March.

Summer. As the weather warms up, strong growth continues and flowers should open. The hybrids tend to flower early, along with species such as *D. tripetaloides*. On the west coast of North America, the main flowering season is between May and August. Flowers may last for six weeks.

Fall. After flowering, the plants are genetically programmed to die back. With good management, other plantlets are already present, and a new tuber has been produced from which a strong new plant will sprout. Even without flowering, mature plant growths will usually die every year, but vigorous plants should always produce new tubers.

Propagation

Mature Disa plants often produce several new plantlets annually, and these provide a simple way of increasing a collection. These new plantlets can grow from new tubers, as keikis alongside the main growth, or from long underground runners (stolons). Disas can be grown from seed to flowering in 2 to 3 years. Seed can be sown on boiled, damp moss, on peat, or on a sterile nutrient agar medium, which is much quicker. One quarter strength Murashige and Skoog formulation, with added banana pulp or powder, works well for *in vitro* propagation. Methods have also been developed for tissue culture cloning of Disas.

General

Despite trying to follow other people’s proven growing methods, I have had my share of setbacks. It pays to experiment to find the best growing medium, watering routine, fertilizer, lighting etc for your specific conditions. Unfortunately, you will probably lose a few plants along the way!

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