

Orchids in the Desert

Every orchid growing environment has its own special challenges. This month, Bev Tall tells us how she grows a mixed collection of orchids in the Arizona desert



KEVIN DUBIEL



ABOVE *Cryptostylis javanica* 'Little Bug', CBR/AOS. Grower: Bev Tall.

ABOVE RIGHT
OPPOSITE

GROWING ORCHIDS IN THE DESERT can be a challenging but rewarding experience. The main concern is to control the amount of light, which is usually too much; the amount of heat in the summer, which is also too much; and the humidity, which is too little. Growing orchids outside is not an option because of the extremes in temperature and the lack of humidity. A few people have been successful growing cattleyas outside using a humidity spray that comes on several times an hour, and providing plants with some shading. Growing genera that do poorly with a wide temperature range is not feasible. However, a few genera, such as *Eulophia* and a few cymbidiums, such as *Cymbidium canaliculatum*, do well in a desert climate.

In the Southwest, many people grow orchids inside their homes. This presents the same problems as elsewhere in the country. There is too

little humidity, which can be augmented somewhat by humidity trays, and there is not enough light, which can be helped by growing lower-light plants, such as phalaenopsis and paphiopedilums. The other problem with growing inside the home is the lack of a night and day temperature difference, which is needed to initiate blooming of many orchids. Sometimes, this can be achieved by putting the plant close to the window, where it will have its own microclimate and allow the night time temperature to drop by 15 degrees. If this is not possible, there are times in the spring and autumn when the plant can be placed outside in a shady spot for a couple of weeks to obtain this diurnal difference and allow the plant to set a spike. It is ideal to have the nighttime temperature in the 50s F (13 C) and the daytime temperatures in the 70s F (24 C) or low 80s F (29 C). This method works well with phalaenopsis, cattleyas and paphiopedilums.

TEXT BY BEVERLY TALL
PHOTOGRAPHS BY GREG ALLIKAS



FLOORING With a larger collection, a greenhouse is a must in the desert. The humidity problem is addressed by putting gravel on the floor of the greenhouse, which should be dirt, not concrete, because the amount of water necessary to increase the humidity is large enough to cause problems if it can't soak into the dirt under the gravel. With a sealed greenhouse and concrete on the floor, you could end up sloshing through a pond on the floor, which is not something one wants to do while tending orchids. The gravel adds surface area so that more water can evaporate, thus increasing the humidity. I have PVC pipe under my benches with sprayers every 2 feet (60 cm) pointing downward so the water sprays the gravel, not the plants. This sprayer system is connected to a humidistat that allows the water to come on when necessary. The sprayers I use are the type that are used to cool

a patio and can be purchased at home-improvement stores. They are readily available, especially in drier climates.

BENCHES I use various types of benches, but most are wire shelves placed on concrete blocks. This allows me to grow nonorchid green plants, such as pothos, underneath the benches, which helps add humidity. Another type of bench I use is a series of gutters placed on a slanted wood base. These gutters are used for the 3- to 4-inch- (7.5- to 10-cm-) square pots, in which grow most of my paphiopedilums. This allows me to grow a lot of plants in a small area. The other benches for larger pots are also wire, but are stepped like stairs to accommodate more plants in the same area.

TEMPERATURE Moderating the temperature is a problem, both in the winter and the summer. To increase heat, many growers use a space heater. However, I find it more efficient and cheaper to use a small water heater and

black irrigation pipe under my benches. I have a small pump that is connected to a timer that circulates hot water in a closed system from the water heater through the pipe and back to the water heater. Because cold temperatures are usually a problem here only at night, I have the heaterCORRECT? connected to a timer that comes on in late afternoon and stops in mid morning. As heat rises, the plants hanging above the benches also receive warmth.

Moderating extreme heat is the main problem in a greenhouse in the desert. This can be done using several methods. One good way is to partially bury the greenhouse several feet in the ground. This helps with the heat and the cold and also allows a greenhouse to be built in a community with restrictions about buildings separate from your home needing to be below a fence line so as not to be seen by the neighbors. This requires a block wall to be built for the space below ground

and then the greenhouse to be built on top of the wall. My greenhouse is 6 feet (1.8 m) below ground. The walls are block with water proofing on the outside and then Styrofoam to insulate. The actual cooling is accomplished by an evaporative cooler that operates well in our dry climate. It pumps water over a cellulose pad and a fan blows on the pad to evaporate the water, which reduces the temperature. I use the type of cooler that has an 8-inch- (20-cm-) thick cellulose pad that increases the efficiency over the thinner pads. Our type of cooler also has a pre-cooler available, which lowers the temperature of the air going into the cooler, allowing the end air temperature to be lower.

I have two coolers, one for the lower level and one for the upper. This works well when it is dry, but when the outside humidity rises, the cooler's efficiency diminishes. In July and August, it is difficult to keep the greenhouse in the 80s F (29 C) during the day and in the 70s (24 C) at night. The larger the area of the greenhouse (both the floor area and the height to the roof), the easier it is to moderate the temperature. One way I have accomplished this is to have a multilevel growing area that allows the bottom area to stay in the intermediate temperature range and the upper areas to be in the warm range, which increases the number of genera I can grow.

On the lower level, I grow paphiopedilums, masdevallias, draculas, phragmipediums and bulbophyllums (both of which I grow in trays of water) oncidiums, and small cattleyas on benches. Over the walkways, I have hanging cattleyas, which receive more light and, in some cases, shade, than some of the plants on the lower level. At the intermediate and upper levels I grow phalaenopsis and warmer-growing cattleyas and high-light plants. The roof of my greenhouse, made of double-paned sliding glass door panels, is slanted to accommodate the three levels. The glass is covered with 50-percent shade in the summer, with the upper part using Aluminet (shade screen) to reflect the heat back out somewhat. The Aluminet stays on all year. On the lower part, I remove the shade cloth in the winter because the distance from the roof to the plants is 10 to 15 feet (3 to 4.5 m) so the light gets diffused in that distance. This diffusion of light means that my lower-light plants are grown at the lower level. In



greenhouses with lower roofs, 50-percent shade cloth is used in the winter and 70 percent in the summer. To help with the heat in the summer, I have overhead sprayers that come on in early afternoon to wet down the plants; the evaporation helps bring down the temperature and raise the humidity. This water is connected to my reverse-osmosis (RO) tank. I do not use tap water to spray the plants. Our tap water would cause chemical buildup on the leaves. Although it doesn't hurt them, it would make them unsightly and cut down on the amount of light reaching the plant.

SAFE TO GROW IN SUMMER?

One of the fears with living in the desert is that if the electricity goes out or the evaporative cooler quits, the temperature in the greenhouse will soar to 120 F (49 C) in a short time, thus frying your collection. As a precaution, many growers in the area have installed sprayers on the outside of the greenhouse that are connected to a valve that has been reversed so that it opens up when there is no electricity. This allows the sprayers to come on and create a column of evaporative cooling above the roof, then rain down on the glass roof, which keeps it cool. I am able to keep my growing area at 100 F (38 C) with no fans or coolers working in the summer with the outside temperature at 110 F (43 C). This may destroy blooms, but the plants survive.

WATERING Water is a problem here because the salt content usually hovers around 800 ppm (parts per million). I use RO water, which I store in a 100-gallon (375 L) tank and then



use a water pump (the kind used in an RV) to pump the water out of the tank and through the hose. I water once a week in the winter and twice a week in the summer with flushing of salts once a month; this means watering copiously with no fertilizer.

I can put my fertilizer directly into the 100-gallon tank rather than using a siphon connection. I use a modification of the Michigan State University



fertilizer that has been formulated for brighter areas, such as the Southwest and Southern California.

I use different growing media for various genera because I want all of the plants to be on the same watering schedule. The plants that require more water are potted in sphagnum moss or coconut chips and the ones that require a drier environment are potted in bark. The smaller pots are in coconut chips

or bark with added sphagnum moss because they dry out quicker than the larger pots.

The pests that invade the orchids certainly do not seem to be specific to this area of the country although mildew is usually not a problem here. I have scale, mealybugs and aphids at times but I do not like to use poisons in my growing area so I use isopropyl alcohol or a spray made from 16 ounces

OPPOSITE
ABOVE



(.5 L) of water, 1 teaspoon (5 ml) of neem oil, 2 teaspoons (10 ml) of 409 cleaner and 2 teaspoons (10 ml) of Listerine, which is an antifungal and antibacterial agent that has been added to the spray as a preventative. Both of these are contact sprays. The first desiccates the bugs and the second smothers them. When things get particularly bad I buy some ladybugs to release and they take care of soft-

bodied pests in short order. They are best for controlling aphids and mealybugs, but do not touch the hard scale.

A product that has recently come on the market is boric acid laced with sugar that does a good job on ants and other crawling insects because they are attracted to it more than plain boric acid.

For spider mites, I used predatory

mites, which are available at biological supply businesses. Yellow sticky bug paper helps trap gnats. Glue traps placed on the benches help trap crawling insects. If I see bacterial or fungal rot on the leaves of my orchids, I cut the rot away and sprinkle with cinnamon, which stops the progression of the rot. Cinnamon also seems to jump start the plants that are not growing at their normal pace. Another substance



that treats rot is hydrogen peroxide. Use a 3-percent solution (undiluted) directly on the plant. This seems to work especially well on phalaenopsis.

All in all, growing in the desert is possible. We just have to modify the environment, such as temperature and humidity. We do not have to generate light, but lower it. The higher light levels make the plants grow quickly and it is possible to grow a variety of

orchids both in the intermediate and warm levels.

Beverly Tall is an AOS accredited judge and secretary of the Pacific South Judging Center. She serves on the AOS Education Committee and is a trustee for the Orchid Digest Corporation. She loves to travel and is an avid birder. 16147 Keota Drive, Fountain Hills, Arizona 85268 (e-mail bevtall@talco.com).

OPPOSITE TOP (Will show shot looking up at roof with PVC pipe and sprinkler head).

OPPOSITE ABOVE
ABOVE