

Preventing Problems in

Taking Precautions to Safeguard Orchids in the Greenhouse

BY STEVE KLITZING, MA

UNLESS YOU LIVE IN FLORIDA, Hawaii, Southern California or South Texas, when winter comes knocking at your greenhouse, the possibility of diseases and afflictions cannot be far behind. In tropical and subtropical climates, temperature variations rarely dip low enough to spawn orchid-killing conditions. But if you live in a more temperate climate, with cold winters and chills that require you to grow sensitive orchids inside a greenhouse, then you need to know how to prevent disease conditions during the winter. Within the temperate zone, temperatures range from mild along coastal areas to bitterly cold inland where the mercury falls below zero. Variation in the climate can influence how best to prevent and deal with ailments in a greenhouse during the winter.

COMMON AFFLICTIONS There are several types of ailments that tend to appear in winter, although they may occur at other times of the year.

Botrytis This is a fungus that often appears on orchid blossoms. It is especially apparent when the flowers have opened. When you wait a year for an orchid bud to unfurl, only to have the petals speckled with brown and black dots, it can be discouraging. This condition is caused by mild temperatures and/or too much humidity.

Brown Rot This affliction, caused by the bacterium *Pseudomonas*, causes the leaves, usually those at the top or crown of the plant, to develop large brown streaks because water has settled on the top of the plant. The entire leaf may turn chocolate brown. If brown rot attacks the growing tip of the orchid, consider it toast. Brown rot will also attack flower spikes and buds, causing them to fall off or wither into muck.

Black Rot Large black sunken lesions on orchid leaves indicate the presence of black rot. If you inspect those lesions, you'll discover they ooze liquid. If your plants become infected with black rot, chances are the orchid

roots are also rotting, indicated by a brown or black color. This condition can be caused by *Pythium* and *Phytophthora* fungi, which can thrive because of overwatering and moderate temperatures.

Green Algae Also known as green slime, green algae is not particularly dangerous to most orchids. However, it creates a problem when it spreads to the walls and ceiling of a greenhouse and cuts down on badly needed wintertime solar intensity. This condition is caused by excessive humidity and, if it appears on a greenhouse floor, the additional culprit is fertilizer runoff.

Cold Shivel Although not a disease per se, cold shivel can plague orchids in a greenhouse during the winter. There are four possible culprits: A fan blowing cold air across the orchids during the day or night; an automated vent sucking in cold air, freezing and drying the orchids next to it; a night of below-zero external temperatures without greenhouse heating; and exposing stressed plants to cold night temperatures. Stressing can be caused by overdue repotting, underwatering and overwatering.

Slugs and Snails A major affliction, slugs and snails can severely damage an orchid collection. And it's possible they can spread disease from plant to plant. Winter is the most likely time for snails and slugs to invade the greenhouse. With everything so cold outside, they're looking for a pleasant home and fresh greenery.

Viruses Viruses can strike at any time of the year and in winter, under the right conditions, they can become more apparent.

PREVENTIVE MEASURES By taking effective preventive measures before the dead of winter arrives, you

RIGHT Several methods exist for controlling slugs, which are especially bothersome during the cool moist days of winter.



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the Winter





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YIN-TUNG WANG

can ensure a healthy winter greenhouse environment for your orchids.

Reduce Humidity Too much relative humidity can kill orchids, with the main damage occurring at night. Humidity causes moisture to condense on the leaves of orchids and create conditions ideal for *Botrytis*, petal blight and algae. If you have a misting system or a fogger, and live in a mild climate, turn it off from November through March. If you must mist, do so by hand during the morning at around 10 am and make sure you do it

lightly. This allows any excess humidity to dissipate long before evening. In frigid climates, where greenhouses are kept closed during the winter and maintaining adequate humidity is a challenge, keep misters active. Consider tying a humidistat into your climate-control system so when the humidity drops to a certain level, such as 60 percent, the misters will turn on.

Reduce Watering This is a hard thing to master for most orchid hobbyists. The tendency is to over-water because, during warm summer

months, orchids do not react adversely to overwatering. However, during the winter, too much water will kill the roots on most tropical orchids. Terrestrial and semiterrestrial orchids can take more water than epiphytes. But, even then, I have watched healthy specimens of *Arundina* and *Sobralia* turn brown from the bottom up until the last leaves on top withered and dropped.

Depending on your conditions, in winter you may need to water at an interval of seven to 10 days, instead of every two or three days as in summer. This depends on the type of orchid. In September, begin extending your watering interval by about two days per month. In other words, if you're watering every third day in early September, then by October water every fifth day and by November, every seventh. Most epiphytes will do better with this type of treatment.

Terrestrial orchids benefit from having a lighter potting soil containing perlite, sphagnum peat moss and fine fir bark. Epiphytic orchids should not be grown in rock in cool climates because stone is too cold in winter. While pumice is a better type of rock to use, the pockets on the surface of

LINKS

<http://www.aos.org/aos/orchids/orchids.aspx?sec=27>

<http://www.aos.org/aos/orchids/orchids.aspx?sec=28>

These two informative essays — both on the American Orchid Society's Web site — offer general advice on ailments and how to control them. This practical advice, helpful at any time of year, is especially appropriate during the winter when plants indoors and in the greenhouse are especially susceptible to attack.

<http://www.geocities.com/RainForest/Vines/7040/article.html>

In this chapter reprinted from the book *Growing Orchids in Canberra*, Jane Write talks about "Orchid Pests and Diseases." Many common insects are discussed, and symptoms as well as solutions are given for each one.

http://nat_hist.sdstate.edu/Orchids/Pests/mites.htm

Mites can be a problem during the winter in dry environments. Here, Paul J. Johnson, PhD, with the Insect Research Collection at South Dakota State University, offers detailed information on these culprits, complete with color photographs and detailed notes on their life cycles.



that substrate trap fertilizer salts that can eventually kill an orchid. Rock mixes increase heating costs in order to keep their thermal mass warm. Fir bark allows the grower to reduce energy costs because of its insulating properties. In temperate winter zones, use fir bark instead of rock.

Clean Up Dead Matter Before winter comes, employ the excellent habit of greenhouse cleanup. Trim all dead matter from your orchids, including dead blossom spikes. Clean up benches and floors. Repot those orchids whose bark has decomposed. When you repot or divide, do it at a potting station set up inside the greenhouse, or elsewhere, such as in the garage or kitchen. Make sure you trim off all dead or dying roots. *Botrytis* often starts out on dead plant matter. By removing detritus, you remove a breeding ground for winter danger.

Circulate the Air Lack of adequate air circulation during the day can cause greenhouse diseases to appear and spread. This is true at any time of the year. In milder climates, make sure the main greenhouse exhaust fan activates a few times a day and once late in the

evening, just for a few minutes each time, to reduce the buildup of humidity. Initially, in cold regions, this may bring in cold air. But, that air will warm up quickly during daylight hours to reduce the relative humidity. Make sure you have a portable oscillating fan to circulate the air inside your greenhouse. This keeps disease from settling. It also lifts condensation off the orchids and sends it up toward the main exhaust fan. Do not run any intake fan in the early morning, the late afternoon, dusk or night. Doing so will suck in, or circulate, unwanted cold air. It can also reduce your efforts to warm the greenhouse at night. Operate fans that circulate warm air 24 hours a day.

Provide Proper Warmth at Night If a greenhouse suffers from low night temperatures, it can kill many tropical orchids. You need to heat the greenhouse, and, in this time of high energy costs, you must do it affordably. An electric coil heater will use the most power and tend to dry out the orchids. An oil-filled electric radiant heater is better for the orchids, but less efficient at heating a greenhouse. Where permitted, you can use a wood or pellet stove for heat. But the real cost

OPPOSITE LEFT Walking through the greenhouse every day to inspect plants for ailments and to remove dead flowers and leaves is part of a proactive program to keep orchids healthy.

OPPOSITE TOP RIGHT Removing weeds in the seedling stage is easily done with tweezers.

OPPOSITE BELOW RIGHT If the medium is kept too wet for extended periods, mold can grow on its surface. This is one reason to avoid bringing potted flowers, including orchids, to patients in hospitals, particularly those who just had surgery.

ABOVE TOP LEFT Excessive humidity and incorrect temperatures can lead to rot, shown here on leaves.

ABOVE LEFT Virus, which can infect orchids at any time of year, can infect many types of orchids, including the *Cattleya*-like hybrid shown here.

ABOVE Operating an oscillating fan in a growing area helps circulate warm air and prevent ailments.



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ABOVE Cold shrivel can plague orchids in a greenhouse during the winter. An orchid will shrivel up and die, with leaves turning dry and light brown in the process.

involves how your greenhouse retains that heat. Polycarbonate greenhouse cladding is filled with air tubes that provide effective insulation and heat retention. But if you own a glass greenhouse, you will have to insulate the inside with clear plastic tarp or bubble wrap. Bubble wrap is the more expensive of those two materials, but it also retains heat effectively. The wrap should be the small-bubble type because it has more thermal efficiency. 6-mil clear plastic tarp is inexpensive, but must be stapled to 1 × 1-inch (2.5 × 2.5-cm) wooden framing attached to the greenhouse frame. If you use tarp, you basically have to build a tent over the inside glass cladding of the greenhouse. Either way, you save money and, by maintaining proper night heating, avoid many of the disease conditions that kill orchids. Be careful when installing bubble wrap, as some of the punctured bubbles can fill with water overspray or humidity condensation, resulting in round pockets of water filled with algae here and there. This can lead to the spread of algae, known as algae creep, from those pockets to more insulation, benches and orchids.

Control Algae As winter approaches, spray the interior walls, ceiling and floor of the greenhouse with a mild solution of bleach (1 part Clorox: 10 parts water). This will effectively kill algae. But do not allow the bleach to reach your orchids. You can gently lay a plastic tarp over the plants when you spray. Make sure you control algae before winter sets in. If you have a glass greenhouse, spray before installing thermal insulation.

Control Slugs and Snails Control slugs and snails with baits such as Sluggo, Snail and Slug Death or Deadline. You can use a copper-based spray, too, but other plants may be sensitive. If copper spray hits bromeliads, they may die.

At monthly intervals, leave out two or three small containers full of beer on the greenhouse floor and benches. One bottle of beer a month is a cheap price for total slug and snail control, catching what the other baits do not. I have been amazed to find huge slugs floating in beer.

Also leave out some cups full of metaldehyde or ferric-based bait. Each month, dispose of the cups. If you use a metaldehyde bait, keep pets and children out of the area where it is exposed.

Patrol Once a Day During the winter, patrol the greenhouse daily. Morning is the best time to spot the formation of disease. There is no substitute for keen observation. Pay attention to your greenhouse. Inspect and observe. A once-a-week visit is not adequate during the winter. Inspection takes only a few moments and can save your plants and your bank account.

By following these simple guidelines, precautions and actions, you will have a greenhouse full of orchids that survive and thrive during the dreaded chill of winter.

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↑ SYMPTOM If tropical orchids start dying for no apparent reason and their leaves start to yellow and fall off, then night temperatures are possibly too low.

SOLUTION You can detect cold conditions at night inside a greenhouse using three techniques:

High Tech — Install a minimum/maximum thermometer in your greenhouse (above). Some models are manual, while others will reset each day. In the morning, you can see the minimum night temperature and the maximum day temperature of the preceding day. If the night temperature is falling too low (below 50 F [10 C] is bad for phalaenopsis and vandas), increase the heat.

Bio Tech — Place a phalaenopsis orchid about 6 inches (15 cm) above the greenhouse floor in the northeast corner as an early warning system. If that orchid begins changing color and suffering — the leaves yellow, then black spots appear in the yellow areas — you know that night temperatures are too low.

Low Tech — Just walk into the greenhouse — in your robe and pajamas is fine — at 6 am before you do anything else that morning. Take off the robe and stand still for one minute. If you're cold, so are your tropical and subtropical orchids.

Move orchids sensitive to low temperatures to higher positions where they can take advantage of rising heat. Avoid watering practices that create any soggy potting medium.

What to Do if Preventive Measures Fail



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↑ **SYMPTOM** Holes in leaves, rasped edges on leaves, rasped pitted or sunken areas on leaves, or similar marks on inflorescences and flowers, indicate snails and slugs.

SOLUTION Get rid of snails and slugs. Put out bait, but use two or three different kinds — metaldehyde-based (Slug and Snail Death), ferric-based (Sluggo) and beer (Beck's seems to work fine). Place a yogurt cup containing a blob of Deadline on its side on top of the affected plant's medium and stop watering the plant. This forces the slugs and snails directly to the bait. Place snail bait in cups or cans on the floor of the greenhouse, and one on every bench. Place beer in a cup or can on the floor of greenhouse to draw away slugs.

SYMPTOM If, early in the morning, you see water droplets on your orchid leaves, or condensation and drips on the ceiling, you know there may be too much humidity in the greenhouse.

SOLUTION Buy a humidity meter and place it above the orchids to give you a reading of the humidity level in the greenhouse. Make sure you have an oscillating fan operating during the day and night to ensure that the main greenhouse exhaust fan operates for at least a few minutes during the warmest hour of the day to blow out excess humidity. Turn off the water on cooling pads earlier in the afternoon to allow drying before the exhaust fans stop operating in the evening. In mild climates, reduce watering, misting or both.

SYMPTOM When leaves or pseudobulbs develop watery black sunken lesions, you have black rot.

SOLUTION Remove the plant from its medium and perform surgery on rotted parts, using a sterile scissors, kitchen knife or a single-edge razor blade. Disinfect the tool with a can of Lysol spray, wipe off with a paper towel and toss the towel into the garbage. Next, light a candle and pass the blade of the tool through the flame until the blade is hot, and then fully extinguish the candle. Cut off dead roots, brown or black pseudobulbs, and rotted leaves, making sure the cuts are made into healthy tissue toward which the rot is spreading. Dust cuts and cut edges with agricultural sulfur. Place the diseased plant tissue and old potting medium in a plastic bag, tie it up and place into the outside garbage bin. Repot with a clean, sterile pot and new orchid medium. Refrain from watering the plant for a few days, and stop watering so much.



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↑ **SYMPTOM** When flower petals look like they've been drilled with pin-size black-speckled holes or have brown speckles, your orchid has *Botrytis*.

SOLUTION No matter what you do, including spraying with fungicide, you cannot save the affected flowers. Even if they open fully, they will look terrible. Immediately remove the blighted flowers, or flower stalk, and place the diseased plant matter in your outdoor recycle bin. *Botrytis* ruins just the flowers and not the plant. Change greenhouse conditions, making sure you reduce humidity, particularly at night. Treat with Daconil at 50–75 ppm of the active ingredient; wear protective clothing and shield the eyes.



GREG ALLIKAS

↑ **SYMPTOM** Weird, repeating or concentric patterns or strange coloration on the orchid leaves spell virus.

SOLUTION There's not much you can do except toss the plant and its medium into the outside recycle bin.

SYMPTOM Gray-colored hairy mold or medium brown lesions on leaves and crown of orchid indicate rot.

SOLUTION Spray immediately after sunrise with a fungicide rated safe for orchids. Most greenhouse fungicides fall into this category. Increase night temperature and reduce humidity. Avoid watering too frequently or having the medium staying wet for long periods. Make sure you have an oscillating fan to move air around during the day. Wait a couple of days and inspect the affected plants. If the disease has damaged the leaves, the damage will still be visible. — *Compiled by Steve Klitzing, MA.*

TO LEARN MORE

Expand your horizons about orchid ailments by visiting the Web sites listed on page 830. Additional information is in *Orchid Pests and Diseases*, a 124-page softcover book with chapters contributed by experts in the field. The 68-minute video *Orchid Pests and Diseases* offers additional information on this subject, including demonstrations on two methods for detecting virus. Both the book and video are available on line at www.aos.org or by calling toll free 1-877-ORCHIDS (672-4437) or 561-404-2021.