

## American Orchid Society FAQs

### Are orchids hard to grow?

No. They are no more difficult to grow than many popular flowering plants. Like any plant, an orchid needs water, fertilizer, light and air. If you grow other ornamental plants either in the garden or indoors, you can grow orchids.

### Aren't orchids terribly expensive?

Not anymore. Once a hobby for the wealthy, orchids are now within the reach of any income. You can spend as little as you like, but trying to own only one orchid is like trying to eat one peanut.

### Are all orchids the same?

Quite the contrary. No plant family is more diverse. The orchid family is the largest plant family, occupying almost all possible environments. From the thimble-sized *Mystacidium caffrum* to the 20-foot-tall *Renanthera storei*, orchids exhibit amazingly different shapes, forms and growth habits. Some orchids produce blossoms no larger than a mosquito; other orchid flowers are as large as a dinner plate. Your familiar corsage is just one of the thousands of attractive types that can be grown with ease, given the proper culture. And with today's propagation methods and current hybridizing trends, there are more choices to choose from than ever before.

### Are orchids parasites?

Absolutely not! Of the approximately 28,000 species of orchids that grow around the world, not one is parasitic. In nature, many orchids cling to trees and bushes as a growth habit, but they do not injure the host plant in any way. Orchids that grow on trees are called epiphytes or air plants.

### Do orchids come from the tropics?

Some do, but orchids can be found in every country in the world and every state in the United States, including Alaska.

### Do I need a greenhouse?

No. Many popular orchids can be grown in your home or under lights. In tropical and semi-tropical areas they can often be grown in a shade house, in the backyard or hung under a tree. When selecting plants, choose those that will survive in the environment you have to offer.

### Should orchids be protected from drafts?

No, as a matter of fact, orchids require moving air. They do best where there is a steady, moist breeze. However, they should be positioned away from air-conditioning or hot-air vents.

### What sort of soil do orchids need?

In nature, orchids can be divided into four types according to growing conditions. Most are classified as epiphytes, or air plants, which grow chiefly on trees. Lithophytes cling to the surfaces of rocks. Saprophytes grow in decaying vegetation on the forest floor. Finally, there are terrestrials, which anchor themselves in soil or sand. As most orchids are epiphytes, they can be grown in tree bark (e.g. fir or redwood), crumbled natural charcoal, pebbles, moss, or mounted on tree-fern or cork plaques. Most orchids will not grow in garden soil or dirt because their roots must be able to dry out. Think of most orchids as air plants which if potted, require an open media in which to grow.

### Are orchids short-lived?

Most are long-lived. In fact, some species are virtually immortal, given the proper attention. Divisions or propagations of orchids discovered in the 19th century are still growing and flowering today.

### How often do orchids bloom?

It depends on the plant. Some bloom once a year, others bloom several times a year and some even bloom continuously.

### How long do orchid blooms last?

It depends on the type as well as on cultural treatment. Blooms of hybrids of the genus *Cattleya* may last from one to four weeks on the plant. Those of the genus *Phalaenopsis* commonly last from one to four months, sometimes even longer.

### Are orchids fragrant?

Some are so powerfully scented as to perfume an entire greenhouse or living room. A few orchid fragrances defy description, while others mimic familiar aromas — raspberry, coconut, lilacs and citrus. Others have no scent, but rely on shape and color to attract insects or birds for pollination, thereby continuing the life cycle of the species.

### Where can I buy orchids?

Hundreds of orchid nurseries, many of which advertise monthly in *Orchids* magazine, exist in the United States and around the world. Most likely there are some close to you. Additionally, many fine growers will ship orchids right to your door! And today orchids are found in the "big box" stores and perhaps even in your local supermarket. Visit the AOS website at [www.aos.org](http://www.aos.org) to learn about savings on orchid purchases with a two-year membership to AOS.

### Is conservation of orchids an important issue?

Absolutely! Sadly, orchid species are becoming extinct faster than they can be described and classified. Threats to orchids originate primarily from loss of habitat and collecting. The AOS advocates the purchase of only artificially propagated orchids, either from meristems (clones) or seeds, which will help discourage the collecting of orchid species at home and abroad. For more information about this serious topic, and to learn how to get involved and to support conservation efforts, visit the American Orchid Society website at [www.aos.org](http://www.aos.org).

### Where can I get more information?

First, check out the AOS's website at [www.aos.org](http://www.aos.org). You will find reliable information on how to grow all types of orchids. The AOS popular culture sheets written for novice growers are available for some of the more popular types of orchids. There is a section entitled "ORCHID BASICS" which answers many specific questions about growing orchids such as watering, feeding, and how to cut the spike on your phalaenopsis. Also, there are many videos or webinars that share information including how to pot your orchid. Additionally, there are many excellent books and publications available to help a novice grower learn more. The AOS offers a discount on its publications if you are a member. Most bookstores and public libraries have good orchid book selections also, as do some commercial orchid firms.

### How can I find out about Orchid Society meetings?

Perhaps the most useful learning step is to become a member of your local orchid society. Currently, there are more than 400 orchid societies that are affiliated with the AOS scattered around the globe. A listing of these affiliated societies can be found at [www.aos.org](http://www.aos.org).

### Should I become a member of the American Orchid Society?

Yes! There are many benefits to joining the AOS. A few are:

- Monthly subscription to *ORCHIDS* magazine
- Access to online orchid information and features available in the "Members Only" section
- Free and discounted admission to more than 300 botanical gardens and arboreta
- Discounts on AOS publications via phone, mail or on-line at [www.aos.org](http://www.aos.org)

By joining or renewing now for a two-year period, you will receive vouchers good toward over \$700 toward orchids purchased at participating orchid nurseries nationwide!

For more detailed information regarding growing orchids, visit the American Orchid Society's website at [www.aos.org](http://www.aos.org).



American Orchid Society  
Education • Conservation • Research

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# Catasetum

Kat-ah-SEE-tum

This unusual group of orchids offers fascinating, waxy flowers that often have the peculiar habit of discharging their pollen masses (pollinia) onto pollinators. Almost always deciduous, the pseudobulbous plants have strict growing and resting periods. Most flower before entering a dormant period when they drop their leaves.

**LIGHT** should be strong, especially near the end of the growth period. Early in the annual growth cycle, plants will tolerate less light, from 1,500 to 3,000 foot-candles. Plants grow best with light levels of 3,000 to 6,000 foot-candles, or one-half to three-fourths full sun. As pseudobulbs mature, harden them by giving slightly more light.

**TEMPERATURES** reflect the fact that these orchids are native to hot tropical areas and grow during the rainy summer months. During this growing period, day temperatures of 80 to 100 F and night temperatures of 60 to 65 F are beneficial. After growths mature, temperatures can be reduced to 55 F at night, with day temperatures of 70 to 85 F.

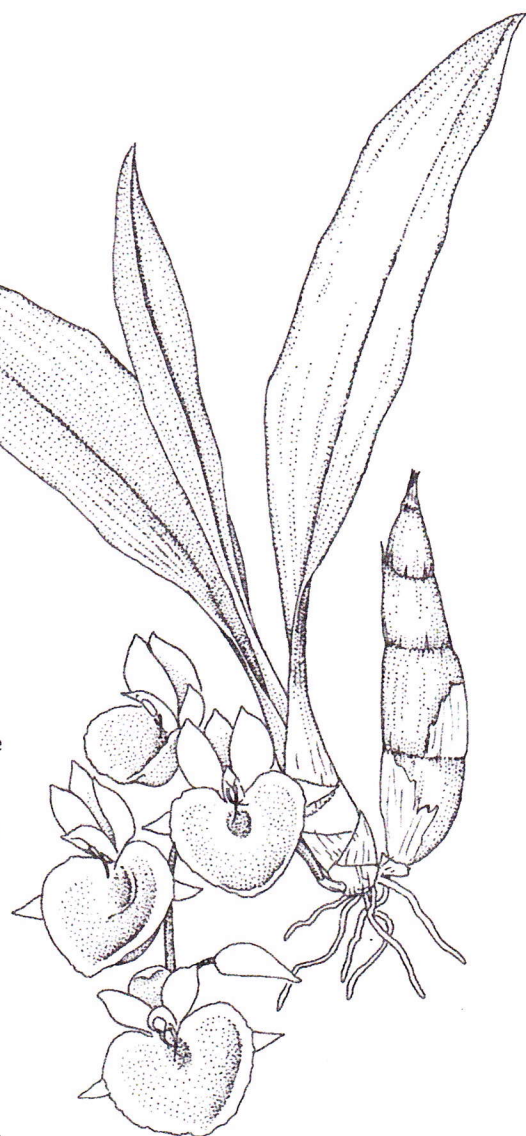
**WATER** is a critical factor for the production of large pseudobulbs that result in best flowering. A great quantity of water must be stored by the plant in a relatively short growing season. Water heavily as new leaves are forming. As the pseudobulb matures, gradually reduce watering frequency. Leaves will yellow and drop. At this time, watering should be stopped completely until new growth begins. Water lightly to rehydrate the pseudobulbs if shriveled severely.

**HUMIDITY** should be 40 to 60 percent. This can be provided in the home by placing the plants on trays of gravel, only partially filled with water so that the plants do not sit in the water. Air should always be moving around the plants to prevent fungal or bacterial disease, especially if high humidity or cool temperatures exist. In the greenhouse, the humidity is best

increased by use of a humidifier while cooling the air.

**FERTILIZE** and water regularly to produce strong pseudobulbs. Use a high nitrogen formulation (such as 30-10-10) while plants are in active growth, slowly tapering off as pseudobulbs forms. A blossom-booster formulation (such as 10-30-20) should be used in the autumn, except for plants that normally bloom in the spring. Frequent applications of a dilute concentrations of fertilizer are more effective than occasional applications of strong concentrations.

**POTTING** should be timed to coincide with the initiation of new growth, usually in the spring. New roots will be produced quickly at that time, and plants will experience minimal setback. These plants have vigorous root systems and require a rich, moist potting medium during the growing season. Many growers bare-root their plants during the resting period to ensure dryness at that time. Fine-grade media are common for smaller pots; medium-grade media are used only in larger pots. Sphagnum moss is used successfully for plants in many areas, as it provides tremendous water and fertilizer-holding capacities. Some plants can be grown on slabs of tree fern or other material, which makes it easier to keep them dry during dormancy; however, it is harder to keep them moist while growing. When well-grown, these orchids can be divided down to one mature pseudobulb and will then flower on the next mature growth.



Spider mites are a common pest of these orchids when in leaf. Control spider mites by keeping humidity high or spraying with recommended miticides.

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## Novice Culture Sheet



### **Cattleya**

KAT-lee-ah

Cattleyas are among the most beautiful of orchid flowers. Often used in corsages and wedding bouquets, their blooms can last several weeks to a month or more. Miniature cattleyas have increased in popularity because of their ease in growing on windowsills in the home.

#### **Water**

Cattleyas store water in both their pseudobulbs and their roots. Miniature catts and seedlings need more frequent watering than the larger standard catts because they store less water.

Potted in a bark mix (finer bark for the smaller catts and seedlings), the mix should be allowed to dry out before re-watering. Summer months and active growth periods will require more frequent watering. After a few waterings, you will be able to tell by the weight of the pot whether or not it is time to water again. If in doubt, wait a day. Generally, watering once a

week to ten days is sufficient for large cattleyas; seedlings and miniatures need water every five to seven days.

When watering, place the plant in the sink and use tepid water. Do not use salt-softened or distilled water. Let the water run through the plant for a minute or so. Be sure to let the plant drain completely.

When watering plants, it's a good time to look closely for any sign of insects or disease.

#### **Light**

Catts belong to the 'high' light group of orchids. The bright light of an east or west window is ideal; south windows can also be used if shaded with a sheet curtain. The leaves should be medium green. If your plant is not blooming for you, try increasing the light. Without sufficient lights, a cattleya will not bloom.

#### **Temperature**

Catts generally enjoy warm temperatures; ideally 55-60 F at night and 70-85 F during the day. Mature plants do well with a 15-20-degree difference in day and night temperatures. Keep in mind that temperatures close to the window on a windowsill will be colder or hotter than your general house temperature.

#### **Fertilizer**

Any balanced orchid fertilizer, for example 20-20-20 (found on the label) can be used to fertilize your orchid. Feeding weakly (1/4 strength) works well for catts. Once a month use clear water to flush any accumulated salts from the potting mix. Increase the fertilizer to 1/2 strength when the plants are in active growth.

#### **Tips**

Use a shallow tray of pebbles filled with water to increase humidity around your plants. Be sure the pot does not sit in water as this will rot the roots.

Give your plants room for air to circulate around them. Crowding of plants can lead to problems with insect infestations and fungus. A small fan will help provide good air circulation around your plants.

When the blooms are finished, remove them from the plant. Continue watering and fertilizing and within a year it will begin the blooming cycle again!

Cattleyas should generally be repotted every two or three years either after flowering or in the spring.

#### **American Orchid Society**

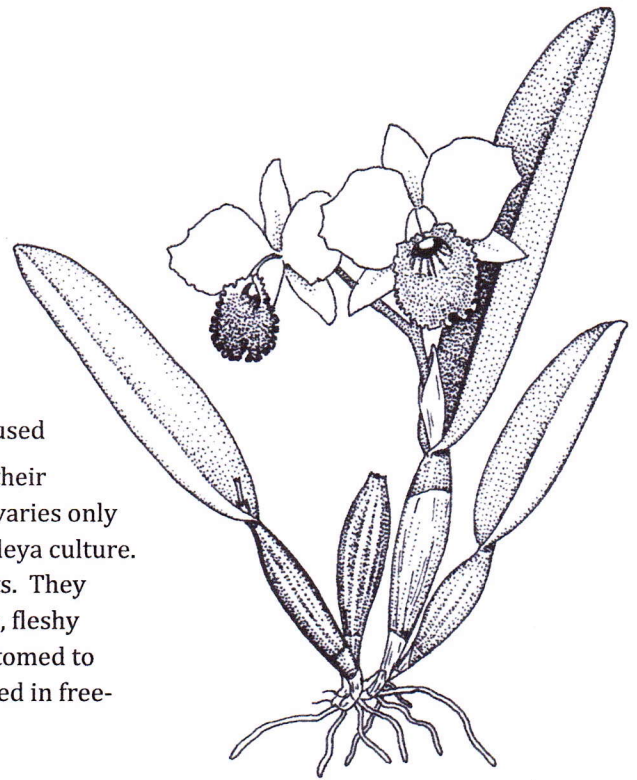
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# Cattleya

KAT-lee-ah

Cattleyas are among the most popular orchids. Their culture is often used as the basis for comparison with other types of orchids. Cattleyas and their related hybrids come in many colors, shapes, forms and sizes. Culture varies only slightly among most of these. This sheet is a general guide to basic cattleya culture. Like many other cultivated orchids, cattleyas are epiphytes, or air plants. They have developed water-storage organs, call pseudobulbs, and have large, fleshy roots covered with a spongy, water-retentive velamen. They are accustomed to being dry at the roots between waterings, and therefore should be potted in free-draining media.



**LIGHT** is the most important factor in growing and flowering cattleyas, whether in a greenhouse or in the home. Bright light to some sun should be given to the plants, with no direct sun in the middle of the day. This means an east, shaded (as with a sheer curtain) south or west window in the home, and 50 to 70 percent full sun in a greenhouse (3,000 to 5,000 foot-candles). Leaves should be a medium-green color, pseudobulbs erect and requiring no staking.

**TEMPERATURES** should be 55 to 60 F at night and 70 to 85 F during the day. Seedlings should have night temperatures 5 to 10 degrees higher. A 15 to 20 degree differential between day and night is recommended, especially for mature plants. Higher day temperatures can be tolerated (up to 95 F) if humidity, air circulation and shading are increased.

**WATER** should be provided in two ways: in the pot by watering and in the air as humidity. Watering in the container is dictated by many criteria: size and type of the vessel, temperature, light, etc. Mature cattleyas need to dry out thoroughly before being watered again. Seedlings need more constant moisture. Compare the weight of a dry pot of the same size and type of mix; it can indicate if a plant needs water by the relative weight – light means dry, heavy means wet. If in doubt, it's best to wait a day or two until watering. Plants in active growth need more water than plants that

are resting. Water temperature below 50 F may injure plants, as will water softened by the addition of salts.

**HUMIDITY** should be 50 to 80 percent for cattleyas. This can be provided in the home by placing the plants on trays of gravel, only partially filled with water so that the plants do not sit in the water. Air should always be moving around the plants to prevent fungal or bacterial disease, especially if high humidity or cool temperatures exist. In the greenhouse, the humidity is best increased by use of a humidifier. Evaporative cooling increases humidity while cooling the air.

**FERTILIZE** on a regular schedule. In fir bark, a high-nitrogen formulation (such as 30-10-10), or a similar proportion is used. Otherwise, use a balanced fertilizer. When in active growth, plants need fertilizer at least every two weeks, and when not actively growing, once a month. Fertilizer can also be applied with every watering at one-quarter the recommended dilution. Thorough flushing with clear water every month is recommended to prevent the buildup of fertilizer salts.

**POTTING** is necessary when the rhizome of the plant protrudes over the edge of the pot or the potting medium starts to break down and drain poorly (usually after two to three years). It is best to repot just before new roots sprout from the rhizome, after flowering or in the spring. Mature cattleyas

are usually potted in coarser potting material than are seedlings. Until a plant has at least six mature pseudobulbs, it generally should be put into a larger pot and not divided. If dividing a plant, three to five pseudobulbs per division are required.

Select a pot that will allow for approximately two years of growth before crowding the pot. Pile mix against one side of the pot and cut off any dead roots. Spread the firm, live roots over the pile, with the cut rhizome against the side of the pot. Fill the pot with medium, working it around the roots. Pack firmly and stake if necessary. Keep the plant humid, shaded and dry at the roots until new root growth is seen.

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## Novice Culture Sheet



### **Cymbidium**

sym-BID-ee-um

Cymbidiums are prized for their long-lasting sprays of flowers. There are two main types of cymbidiums - standards and miniatures. Where summer nights are warm (above 70 F), miniatures are recommended because many are more tolerant of heat and able to flower in warmer weather.

#### **Water**

Provide a constant supply of moisture to cymbidiums. They need the most water during the spring and summer keeping the potting material evenly moist. Reduce water in late summer. Keep barely moist during the winter.

When watering, let the water run through for a minute or longer to thoroughly wet the potting mix. Do not use salt-softened or distilled water. Be sure to let the plant drain completely.

This is a good time to look closely at your plant for any sign of insects or disease.

#### **Light**

From spring to autumn cymbidiums should be grown in the maximum amount of light (but not full sun). Feel the foliage to be sure that it is not warm since the leaves can sunburn. Leaves should be a medium to golden green in color, not dark green.

#### **Temperature**

If practical, bring in the cymbidiums in when frost is likely and then put them out again as it warms up. In the spring, move the cymbidiums out of doors as soon as the night temperature is going to stay in the mid 40's or above and bring them back indoors in the fall when a light frost is predicted. It is very important for initiation of spikes to have a difference in temperatures between night and day. This can be achieved in the summer by sprinkling the leaves in the late afternoon or early evening for evaporative cooling.

#### **Fertilizer**

Any balanced orchid fertilizer (look at the numbers on the container, 20-20-20, etc.) can be used to fertilize your orchid. Feed cymbidiums every two weeks from March until September to help establish good growth and a good number of

spikes in the fall. In late winter and the fall, feed once every three weeks and once a month in the mid winter.

#### **Tips**

Potting is usually done in the spring after flowering, usually every two years or when the potting medium decomposes.

Give your plants room for air to circulate around them. Crowding of plants can lead to problems with insect infestations and fungus. A small fan will help provide good air circulation around your plants when inside.

When the blooms are finished, remove the spikes at the base of the plant.

For more detailed information regarding growing orchids, visit the American Orchid Society's website at [www.aos.org](http://www.aos.org)



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# Cymbidium

Sym-BID-ee-um

**T**hese orchids are prized for their long-lasting sprays of flowers, used especially as cut flowers or for corsages in the spring. There are two main types of cymbidiums: standards and miniatures. Where summer nights are warm (above 70 F), only miniatures can be recommended because many are more tolerant of heat and able to flower in warmer weather.

**LIGHT** is the most important factor in growing cymbidiums. Coming from cool and bright areas in Asia, they need high light but cool temperatures. In many southern climates, high summer temperature, especially at night, may prevent the plants from blooming. The maximum amount of light possible, short of burning, should be given to the plants. This means only light shade during the middle of the day, or about 20 percent shade. In cool areas (such as coastal California), full sun is tolerated. Leaves should be a medium to golden green in color, not dark green.

**TEMPERATURES** are another critical factor in flowering standard and miniature cymbidiums. During the summer, standard cymbidiums are usually grown outside in semi shade where day temperatures should be 75 to 85 F (or more), but night temperatures in the late summer to autumn must be 50 to 60 F to induce flower spikes. Optimum temperatures in winter are 45 to 55 F at night and 60 to 75 F during the day. When plants are in bud, temperatures must be as constant as possible, between 55 and 75 F. Miniatures can stand temperatures five to 10 degrees higher than standards and still flower. Most cymbidiums can tolerate light frosts and survive, but this is not recommended. Bring them inside when temperatures dip to 40 F. In mild climates, they can be grown outside year-round. A bright and cool location inside is best for winter months.

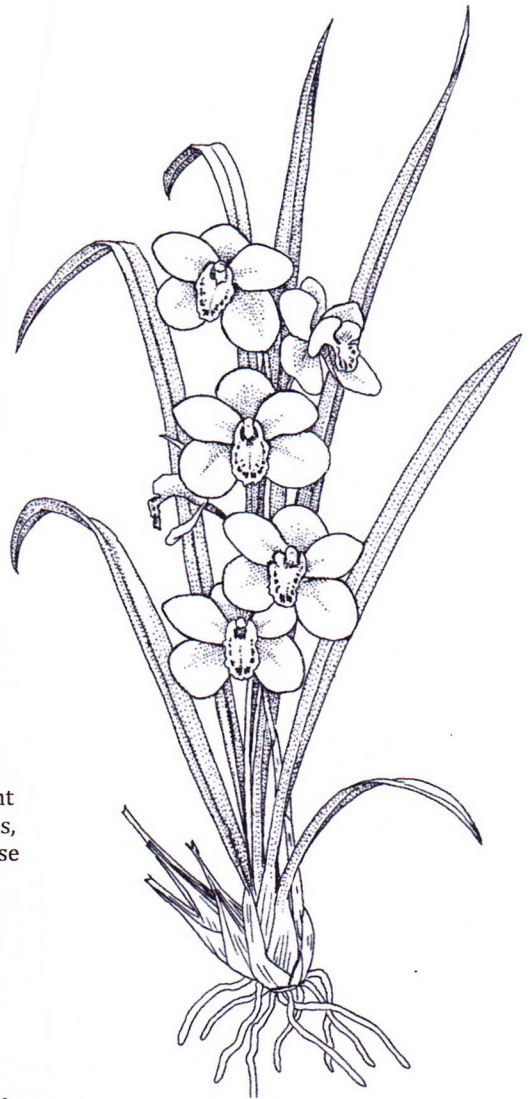
**WATER** should provide a constant supply of moisture to cymbidiums, which are semi-terrestrial plants. They generally produce all their vegetative growth during the spring and summer and need the most water during that period. Water heavily

during the growth season, keeping the potting material evenly moist. Reduce water when the pseudobulbs complete growing in later summer. Keep barely moist during the winter.

**HUMIDITY** outdoors is usually sufficient during the summer, except in dry climates, where evaporative cooling in a greenhouse is necessary. Keep humidity at 40 to 60 percent during the winter, especially if plants are in bud. Keep the air moving to prevent fungus (*Botrytis*) from spotting flowers.

**FERTILIZE** at the proper time to help cymbidiums flower. During the growth season (spring through late summer), high-nitrogen fertilizer (such as 30-10-10) is used. In late summer, use a high-phosphorus, bloom-booster fertilizer (such as 10-30-30) to help form bloom spikes. Fertilize at full strength every week to two weeks. In winter, fertilize once a month.

**POTTING** is usually done in the spring after flowering, usually every two years of when potting medium decomposes. Shade the old potting mix off the roots, dividing the plant if desired. Pick a water-retentive potting mix; medium-grade fir bark with peat moss and perlite is a common mix. Select a pot that will allow for at least two to three years of pseudobulb growth before crowding the pot, while planning on placing the active growing pseudobulb(s) of the division farthest from the side of the pot. Spread the roots over a cone of the mix in the bottom of the pot and fill the container with medium, working it among the roots, tamping firmly.



Single backbulbs not even be placed in mix until new growth and roots are noted. Keep shaded and warm until new growth sprouts, and pot as above.

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## Novice Culture Sheet



### ***Dendrobium***

den-DROH-bee-um

*Dendrobium* is a diverse genus of orchids with different cultural needs. This culture information is for the phalenopsis-type dendrobiums pictured above. They are evergreen with thin, tall stems (pseudobulbs).

#### **Water**

Water your orchids in the morning so that the leaves are dry before night. How often to water depends on the potting media used, the type of pot (plastic or clay), and the size of the pot. Dendrobiums like to be in small pots and are usually much taller than the pot is wide. Because they are usually large plants in relatively small pots, watering twice a week is about average. They like to be almost dry before re-watering.

When watering, place the plant in the sink and use tepid water. Do not use salt-softened or distilled

water. Let the water run through the plant for a minute or so. Be sure to let the plant drain completely.

This is a good time to look closely at your plant for any sign of insects or disease.

#### **Light**

Dendrobiums need lots of light, but not direct sun. A lightly shaded south window is best. East or west facing windows are satisfactory if bright (avoid direct sun except at the beginning or end of the day).

#### **Temperature**

Dendrobiums can withstand hot weather if adequate ventilation and humidity are provided. They are best grown when the temperature is between 65°F and 75°F in the day and between 55°F to 60°F at night.

Keep in mind that temperatures close to the window on a windowsill will be colder or hotter than your general house temperature.

#### **Fertilizer**

Any balanced orchid fertilizer (look at the numbers on the container, 20-20-20, etc.) can be used to fertilize your orchid. Feed weakly (1/4 strength) weekly works well for dendrobiums. Once a month use clear water to flush any

accumulated salts from the potting mix.

#### **Tips**

Use a shallow tray of pebbles filled with water to increase humidity around your plants. Be sure the pot does not sit in water as this will rot the roots.

Give your plants room for air to circulate around them. Crowding of plants can lead to problems with insect infestations and fungus. A small fan will help provide good air circulation around your plants.

When your plant has finished blooming, you can cut the flowering stem at the point where it came out of the tall thin pseudobulbs. Do not cut off the tall thin stem because the new flower stem will grow from there. Continue watering and fertilizing and within a year a new growth will spike to begin the blooming cycle again!

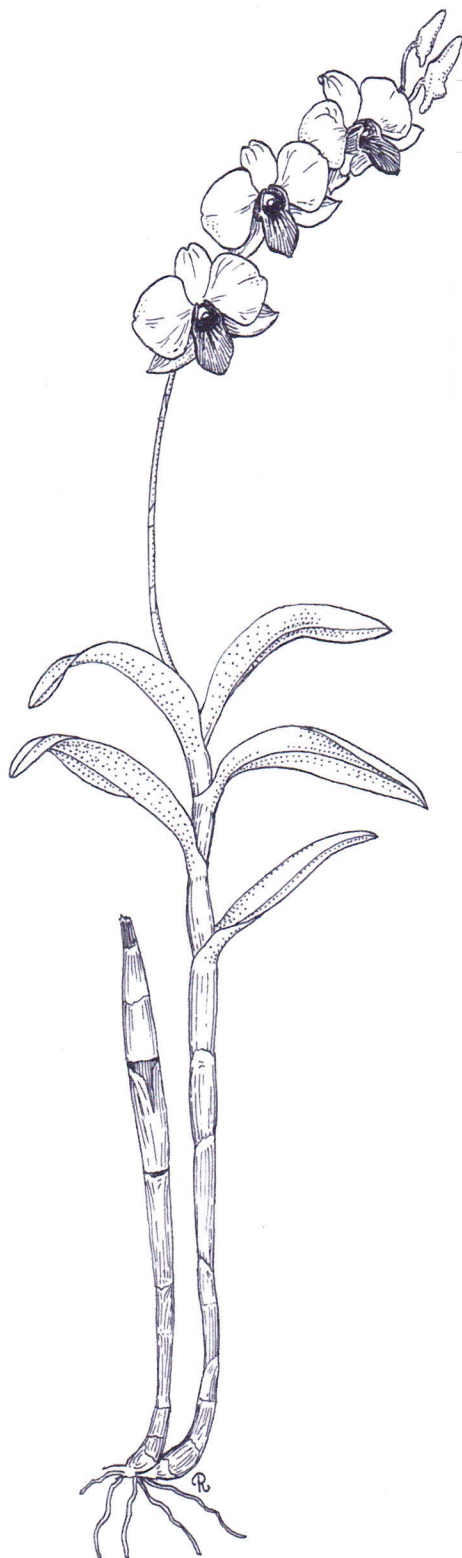
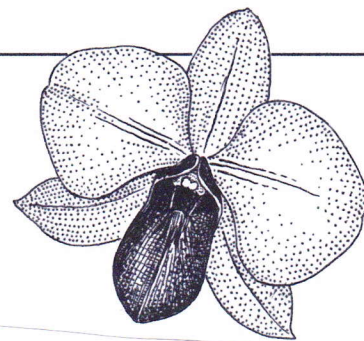
When re-potting, use a small pot; using a large pot will slow growth and reduces flowering significantly. Re-pot every two to three years.

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# Dendrobium

den-DROH-bee-um



## The Spray Orchid

**D**endrobiums are among the most commonly encountered orchids in the retail trade. Like most other cultivated orchids, dendrobiums are epiphytes, or air plants. They have well-developed water-storage organs (pseudobulbs), often called "canes" for their upright, leafy appearance. They should be potted in porous, free-draining media.

There are many different types of dendrobiums available to the specialist grower. However, hybrids involving *dendrobium bigibbum* (synonym *phalaenopsis*) are what you will most often encounter.

### LIGHT

Sufficient light is important for healthy growth and flower production.

**PROVIDE** bright light, to 50 percent sun.

In the home, an east, west or lightly shaded south window is best. In a greenhouse, about 30 to 50 percent full sun is best.

Under lights, set up four 40-watt fluorescent tubes and two 40 watt incandescent bulbs (or the equivalent light from LED bulbs) directly over plants.

Plants should be naturally erect without need of (much) staking and be of a medium olive-green color.

### TEMPERATURE

Mature plants need a 15 to 20 F difference between night and day.

**PROVIDE** nights of 60 to 65 F and days of 80 to 90 F. Temperatures up to 95-100 F are beneficial if humidity and air circulation are increased. Low temperatures below 50 F may cause leaf drop.

### WATER

Keep evenly moist while in active growth. Allow the media to dry between waterings after growth is mature (indicated by a terminal leaf).

### HUMIDITY

Dendrobiums need 50 to 60 percent humidity. In the home, place plants on trays over moistened pebbles. In the greenhouse use a humidifier when conditions are too dry.

### FERTILIZER

Feed dendrobiums on a regular basis during the active growing period.

**PROVIDE** the appropriate fertilizer based on the mix in which your plant is growing. A good general rule is to apply a balanced fertilizer (10-10-10, 12-12-12, or similar ratio) "weakly, weekly" during the period of active growth. That is, fertilize every week at one quarter to one half the recommended dilution.

### POTTING

Repot plants every two to three years before the mix loses consistency (breaks down). Dendrobiums grow best in pots small for the size of the plant, but still allow for two years' growth. The medium should provide aeration and ample drainage. Place the plant firmly in the medium and stake if needed.

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# Habenaria

Ha-Ben-AR-ia

**H**abenaria is a large genus with many charismatic species which produce interesting and often colorful, showy flowers. Though the genus is found in many different environments globally, those most commonly found in collections have similar growth requirements and are generally terrestrial. Species commonly seen in collections include *H. carnea*, *H. rhodocheila*, *H. xanthocheila*, *H. erichmichaelii*, *H. roebbelenii*, *H. medusa* and the varieties and hybrids of these species. This large genus has many charismatic species which produce interesting and often colorful, showy flowers. Though the genus is found in many different environments globally, those most commonly found in collections have similar growth requirements and are generally terrestrial.

**LIGHT** Habenaria are fairly adaptable to light levels and can be grown in a greenhouse, under lights, or outdoors in mild weather and indoors under lights when temperatures drop. Given light levels of 1,000 to 1,500 foot-candles, plants will grow and flower regularly. This level of light can be provided by four 4' florescent tubes placed 6" to 10" above the top of the foliage. Use of an adjustable chain to hang the lights is beneficial as it can be raised as the plants grow. Lights should be on for 12 to 16 hours a day. In the greenhouse, 70% to 80% shade will provide sufficient light levels. Habenaria will produce more flowers per shoot and produce more shoots more quickly given brighter light - up to Cattleya levels of around 3,000 foot-candles. Habenaria medusa requires greater light than the other listed species to grow vigorously. No light is required while plants are dormant; they may be stored in a completely dark location.

**TEMPERATURE** During the growing season, temperatures should be maintained above 50 F at night and between 65 and 80 F during the day. Circulating air and increased humidity during high temperatures are beneficial. During dormancy, temperatures should be above 50 F. Warmer temperatures during dormancy will expedite the breaking of dormancy and the tuberous roots will desiccate more quickly.

**WATER** During active growth, water should be liberally applied. Potting mix should be moist but not soggy and dry slightly between watering. Plants should not be subjected to dry potting mix during growth. Depending on humidity and temperature, water should be applied to maintain proper hydration; hotter temperatures require more frequent

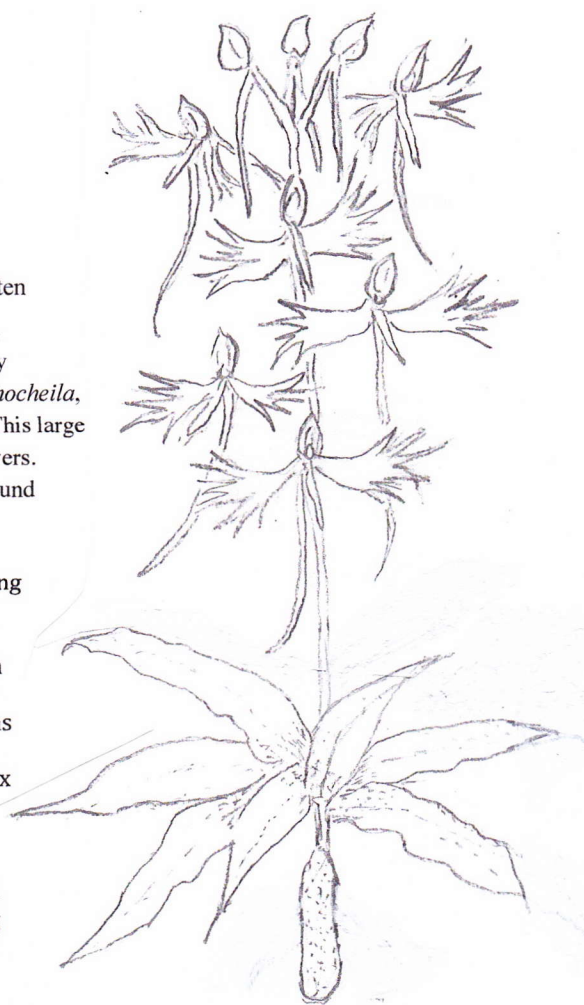
watering. Avoid wetting foliage or allowing water to sit in the center of the growth. Apply water to the potting mix either from the top or from below by setting in a tray of water. Never leave the plant standing in water. Care should be taken as growth resumes in spring and as plants enter dormancy in fall that the potting mix does not stay soggy. During dormancy, water should be completely withheld.

**HUMIDITY** Humidity is best maintained between 50% and 80%. Humidity during dormancy is not critical, though tuberous roots should be monitored by gently tapping out of the container. If they become shriveled, humidity may be a little low and increasing it may be beneficial.

**FERTILIZE** During active growth, fertilizer should be applied regularly following the adage "weakly weekly." A water-soluble fertilizer is easily included in the irrigation water once a week. At higher temperatures and light levels requirement for mineral nutrients increases and better performance may be achieved with by increasing frequency of fertilizer application.

**POTTING** Potting mix should retain moisture but allow for sufficient air (oxygen) at the roots. A mix should provide moisture retention and maintain air space. Combinations of sphagnum moss, perlite, charcoal and bark work well.

Select a pot that is only large enough to accommodate one season's growth. Plastic or clay containers will work, though watering frequency will vary; plants potted in clay will dry more quickly at the roots than in plastic. A deep container which allows space for the downward growth of the new tuberous root is preferred to shallow containers.



Repotting should occur just as growth resumes but before new shoots are too large and easily damaged. Annual repotting is recommended. Repot into moist potting mix and withhold water until the new growth reaches 1" to 2." Following dormancy, the tuberous roots are best left undisturbed in their containers and stored dry until being repotted in late winter or early spring as growth resumes.

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# Lycaste

Lye-KASS-tee

**L**ycastes are deciduous in varying degrees, from the strongly deciduous, yellow-flowered species like *Lycaste aromatica* that flowers from leafless pseudobulbs to the evergreen types like *Lycaste skinneri* with pseudobulbs that retain their leaves at flowering. This genus produces large, long-lasting, showy, triangular flowers that are waxy. The plants are distinctive for their roundish pseudobulbs and broad, plicate (pleated) leaves. Culture for the hybrid genus *Angulocaste* (*Lycaste* x *Anguloa*) follows the culture for the *Lycaste* parent.

**LIGHT** requirements vary. Deciduous species require light conditions as for Cattleyas – 2,000 to 4,000 foot-candles or 50 to 70 percent shade. More light is usually provided as new growths form pseudobulbs. Evergreen species grow best with less light – 1,500 to 2,000 foot-candles or 60 to 80 percent shade.

**TEMPERATURES** for the evergreen species should be fairly constant and never hot. Nights of 60°F and days of 70° to 80°F are desirable. The deciduous species of lycaste can tolerate a wider range, up to 95°F during the day and down to 50°F at Night when dormant in winter.

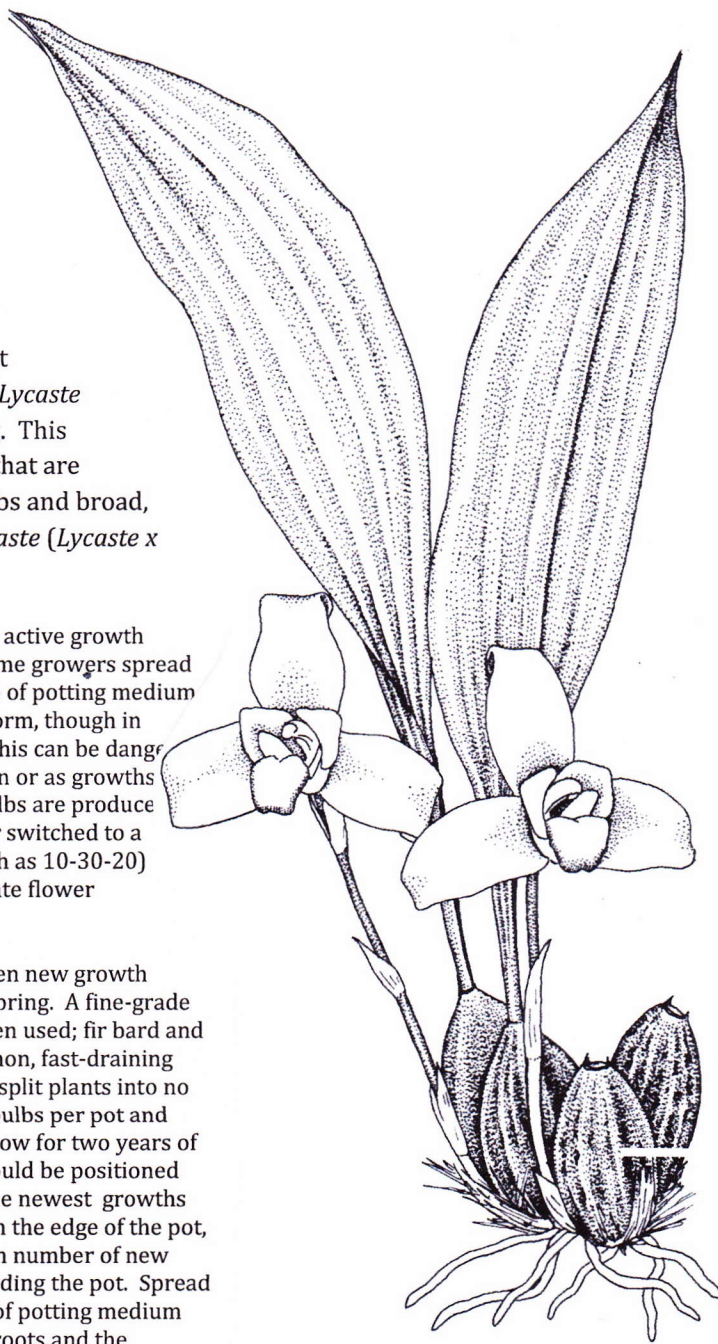
**WATER** should be applied freely during Active growth (usually summer). The potting medium should begin to dry out between waterings. Deciduous species should be kept almost completely dry when leafless; evergreen species should be kept only slightly drier than normal after pseudobulbs form. Water should be kept off the leaves and especially out of the new growths to prevent rot or leaf spotting, which disfigure otherwise handsome plants.

**HUMIDITY** should be maintained at 40 to 70 percent. Deciduous species need less humidity when dormant. Brisk air circulation will help prevent damage to leaves by leafspot fungi.

**FERTILIZE** regularly and heavily when plants are actively growing. A higher nitrogen formulation (such as 30-10-10) is

Recommended during active growth (usually summer). Some growers spread bloom meal on the top of potting medium as new pseudobulbs form, though in inexperienced hands this can be dangerous to the plant. In autumn or as growths mature and pseudobulbs are produced, fertilizer is reduced or switched to a high-phosphorus (such as 10-30-20) formulation to stimulate flower production.

**POTTING** is best when new growth starts, usually in the spring. A fine-grade potting medium is often used; fir bark and perlite (3:1) is a common, fast-draining mix. When repotting, split plants into no less than two pseudobulbs per pot and choose a container to allow for two years of growth. The plant should be positioned in the vessel so that the newest growths are farthest away from the edge of the pot, allowing the maximum number of new growths without crowding the pot. Spread the roots over a cone of potting medium and fill in around the roots and the pseudobulbs. Push the medium firmly around the roots. Keep humidity high and the potting medium on the dry side until new roots form.



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# Masdevallia

mas-deh-VAHL-lee-ah

*Masdevallia* is a genus of some 350 species usually from cool, misty mountains of the New World Tropics. Masdevallias are best known for their showy flowers consisting of sepals fused into a tubelike structure. Their origins in cool, damp environments make them an excellent choice for cool or coastal climates. Most species and hybrids are compact enough so that they can be easily accommodated on windowsills or under lights.

**LIGHT** should be like that given for phalaenopsis and paphiopedilums — 1,000 to 1,500 foot-candles. Masdevallias can be kept in light intensities up to 2,500 foot-candles if the growing area can be kept cool. Plants grow well under standard fluorescent fixtures and can be summered outside in shade. In the home, place in an east or shaded south window or under artificial lights.

**TEMPERATURES** should be cool to intermediate. The plants will grow slowly and eventually expire if temperatures remain high for long periods. Cool evenings help reduce heat stress during the day. Nights of 55 to 60 F are ideal; day temperatures should be 65 to 75 F. Evaporative cooling pads or humidifiers are useful in maintaining these conditions. Avoid day temperatures higher than 80 F.

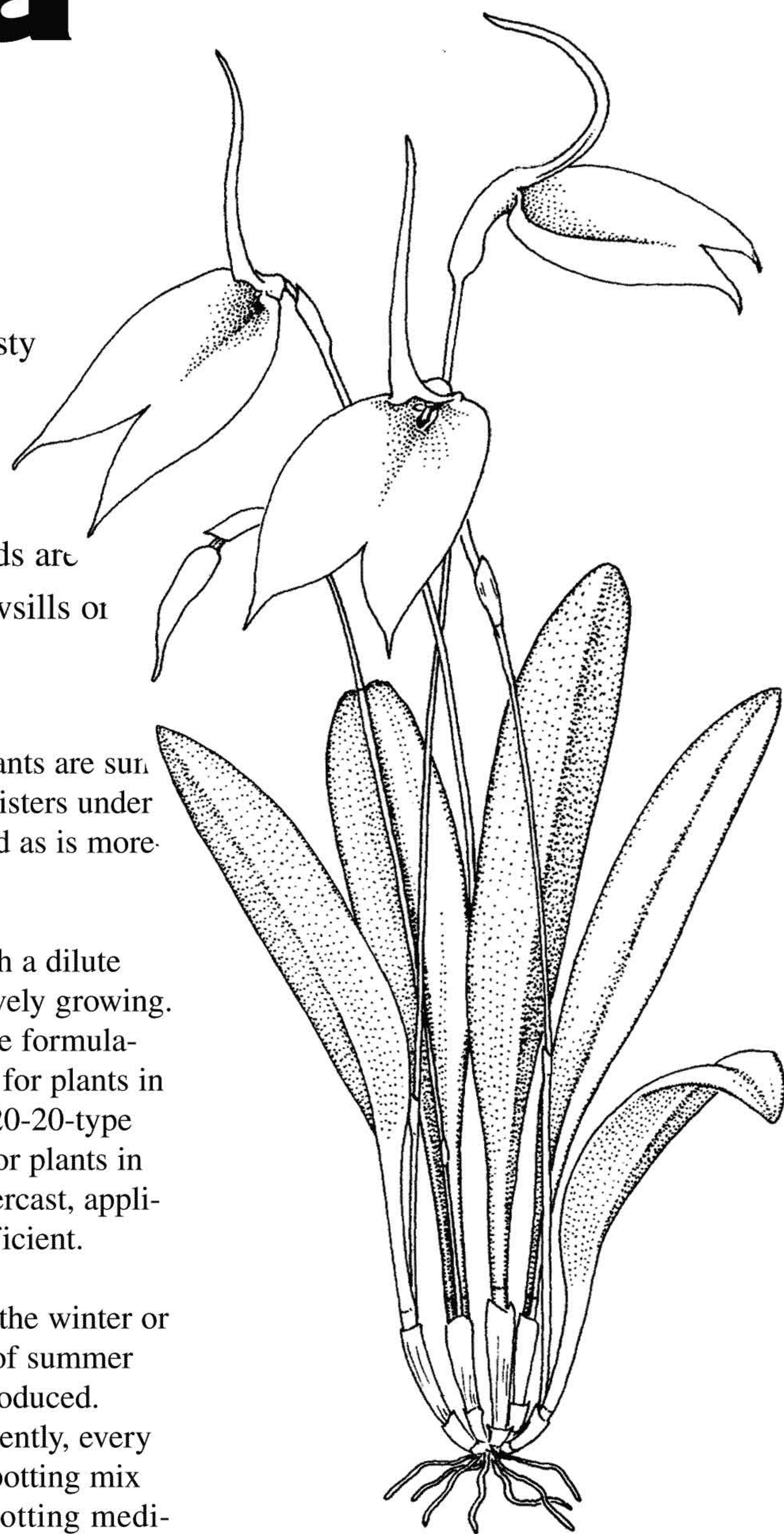
**WATER** is critical for these plants because they have minimal water-storage tissue. Roots should be allowed to become almost dry before watering again; if drainage is adequate, constantly moist roots are fine. Good-quality water low in dissolved solids is imperative for success.

**HUMIDITY** is an important factor in the successful culture of masdevallias. The ideal range is 60 to 80 percent. In the home, set the plants on trays of gravel partially filled with water. In the greenhouse or enclosed growing area, humidity can be increased by use of a humidifier, while evaporative coolers help raise humidity

and lower temperatures. If plants are summered outdoors, automatic misters under the benches are recommended as is more frequent soaking.

**FERTILIZE** regularly with a dilute solution while plants are actively growing. Applications of 30-10-10-type formulations twice a month are ideal for plants in a bark-based medium. A 20-20-20-type formulation should be used for plants in other media. If weather is overcast, applications once a month are sufficient.

**POTTING** is best done in the winter or early spring, before the heat of summer arrives or as new roots are produced. Plants must be repotted frequently, every one to two years, before the potting mix decomposes. A fine-grade potting medium, such as fine fir bark or tree-fern fiber, is often used with plastic pots. Sphagnum moss is also used, especially for establishing plants. The plant should be positioned in the pot so that the newest growth is farthest from the edge of the container, allowing the maximum number of new growths without crowding the vessel. Plants growing in many directions may be positioned in the center of the pot. Spread the roots over a cone of potting medium and fill in around the roots with potting medium to the junction of the roots and the plant. Firm the medium around the roots. Keep humidity high and the potting medium slightly dry until new roots form.



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# Miltonia

mil-TOH-nee-ah

**including Miltoniopsis** (mil-toh-nee-OP-siss)

**T**hese striking orchids, which are also known as pansy orchids, owing to their similarity to garden pansies, are enjoying increasing popularity. *Miltoniopsis* are cool-growing orchids that originate in the higher elevations of the Andes in Colombia, Panama and Ecuador. The warmer-growing species, properly miltonias, originate from the Minas Gerais area of Brazil and more closely resemble large-flowered oncidiums. Their flowers can be brilliantly patterned.

**LIGHT** should be relatively shaded. Direct sunlight burns the thin leaves within a short period of time. However, the warmer-growing types prefer more light than their cooler-growing relatives. The cool-growing species need approximately 1,200 foot-candles, while the warmer-growing species require closer to 2,000 foot-candles.

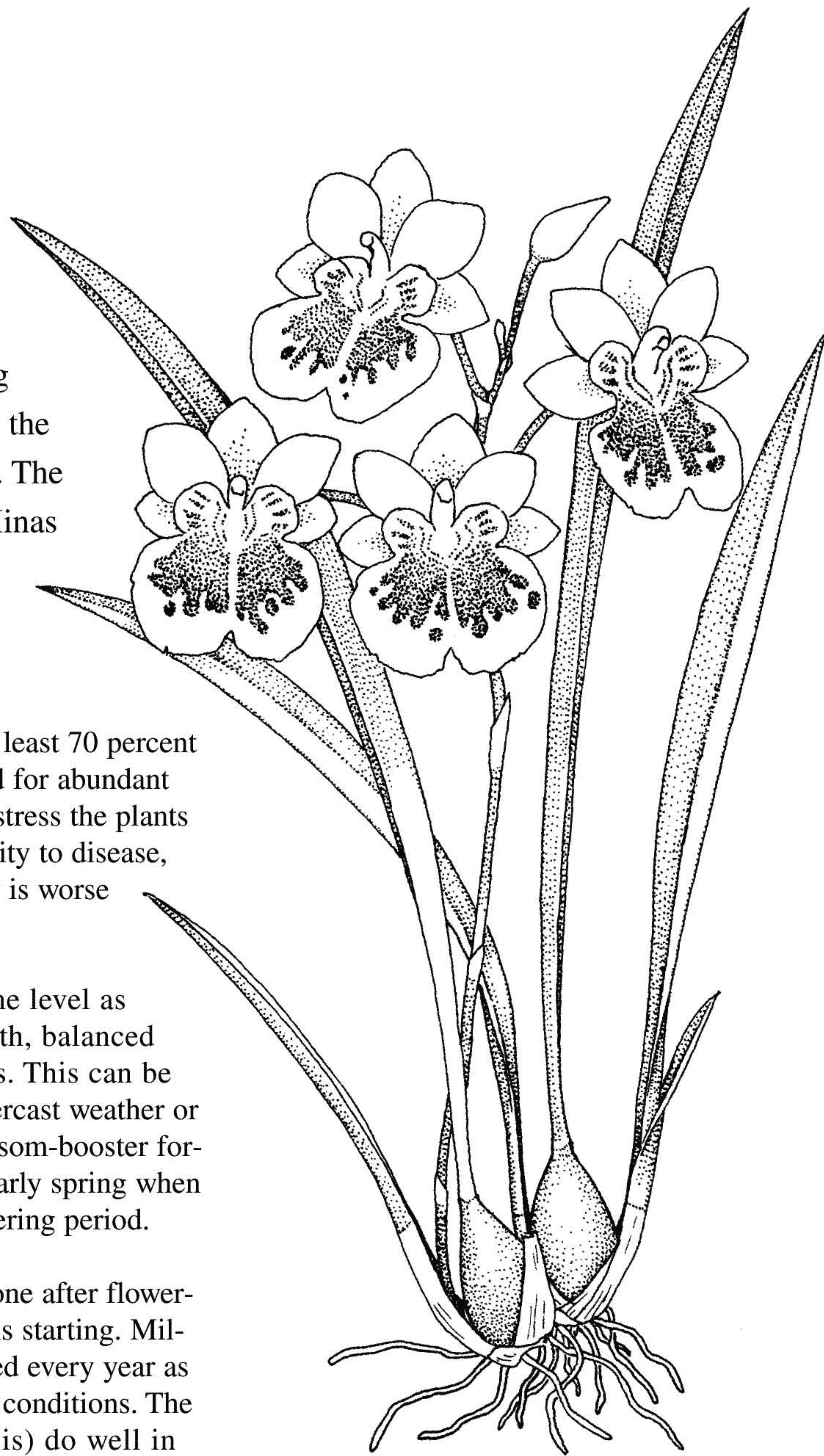
**TEMPERATURE** is critical for the cool-growing plants. Unless temperatures are kept under 80 F, they may not flower. The minimum temperature is 50 to 55 F. Thus, these are really better thought of as intermediate growers because they need intermediate temperatures throughout the year — not too hot, not too cold. The warmer growers will take temperatures over 90 F as long as humidity levels of 70 to 75 percent, or higher, are maintained. The minimum temperature is 60 F.

**WATER** must be plentiful and the medium must drain perfectly. In their native habitat, the plants are drenched almost daily and, because of this, they are intolerant of salt buildup, so leaching every fourth or fifth watering is important when growing in pots. When they are not getting enough water or humidity, the leaves have a tendency to grow with accordionlike pleats. The warmer-growing miltonias should be grown like cattleyas; allow them to approach dryness between waterings. They also tend to be slightly more tolerant of salt buildup than their Colombian cousins so they can dry more between waterings.

**HUMIDITY** must be at least 70 percent because of the plants' need for abundant water. Less humidity will stress the plants and can lead to susceptibility to disease, though too much humidity is worse than too little.

**FERTILIZE** at the same level as other orchids: half-strength, balanced fertilizer every two weeks. This can be reduced by half during overcast weather or in winter. A 10-30-20 blossom-booster formulation is beneficial in early spring when plants approach their flowering period.

**POTTING** should be done after flowering when the new growth is starting. *Miltoniopsis* should be repotted every year as they are intolerant of stale conditions. The cool growers (*miltoniopsis*) do well in small pots. The warmer growers (*miltonias*) tend to have a relatively elongated creeping habit and, therefore, do better mounted. Any potting mix suitable for fine roots such as 70 percent seedling bark with charcoal and perlite or a mix of 70 percent tree fern and 30 percent chopped sphagnum is adequate. Mounts may be cork, tree fern or other hard wood. They should be longer than wide. For some reason, shallow pans work better than deep pots.



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# Odontoglossum

oh-don-toh-GLOS-sum

**T**hese high-altitude orchids from the New World Tropics flourish where cool temperatures prevail year round. Odontoglossums are known for their striking sprays of flowers. Culture is similar for hybrids in this group, some being *Odontonia*, *Odontioda* and *Vuykstekeara*.

**LIGHT** should be bright. In a greenhouse, levels from 2,000 to 5,000 foot-candles are acceptable as long as heat levels can be kept down. If summer day temperatures are high, light levels can be reduced to cool the growing area. While these are not generally considered to be good houseplants, they may succeed at an east window or a shaded south window; western exposures are usually too warm in most climates.

**TEMPERATURES** must be exacting for these plants. Day temperatures below 75 to 80 F are almost essential year round. Night temperatures of 55 to 58 F are best. Short periods of warmer day temperatures may be tolerated, especially if humidity and air movement are at optimal levels, nights are cool and the plants have healthy root systems.

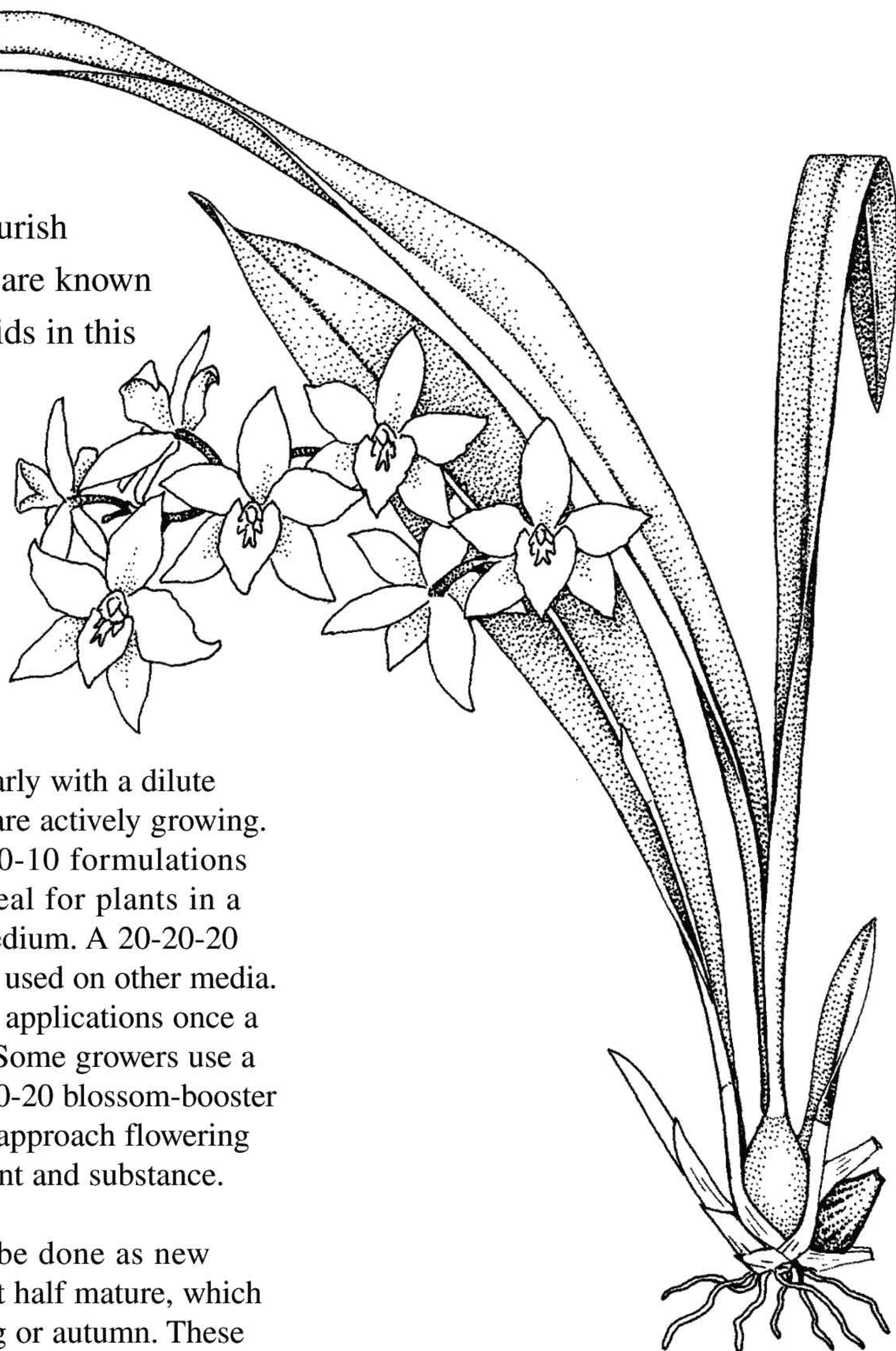
**WATER** should be plentiful, coupled with perfect drainage. The potting medium should just begin to dry before watering. This may mean watering every two to seven days, depending on weather, pot size and material, and type of potting medium. Accordion-pleating on leaves is a symptom of insufficient water or humidity. As with other orchids from high-rainfall areas, odontoglossums are particularly sensitive to poor-quality water, which will give poor roots and leaf-tip burn.

**HUMIDITY**, coupled with moving air, should be ideally 40 to 80 percent. Evaporative cooling in a greenhouse increases humidity while cooling the air and is highly recommended for these orchids in most climates. Fogging the air or dampening the floor with water also helps cool and

humidify. In the home, set the plants on trays above moist pebbles, with the pots resting above the water.

**FERTILIZE** regularly with a dilute solution while plants are actively growing. Applications of 30-10-10 formulations twice a month are ideal for plants in a bark-based potting medium. A 20-20-20 formulation should be used on other media. If weather is overcast, applications once a month are sufficient. Some growers use a high-phosphorus 10-30-20 blossom-booster formulation as plants approach flowering to increase flower count and substance.

**POTTING** should be done as new growth becomes about half mature, which is usually in the spring or autumn. These plants need to be underpotted, so when repotting leave only enough room for one to two years of new growth. Underpotting also enables the grower to provide the more frequent watering these plants need as the smaller pots dry more quickly and evenly when filled with roots. A fine-grade potting medium with excellent drainage is required; because the medium is kept moist, annual or biannual repotting is normal. Spread the roots over a cone of potting medium and fill in around the roots with more medium. Firm the potting mix around the roots. Keep humidity high and the pot dry until new roots form.



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# Oncidium

on-SID-ee-um

This is an extraordinarily large and diverse New World genus with an equally diverse number of habitats. Oncidiums may originate anywhere from sea level in the tropics to the high elevations of the Andes. This obviously makes cultural generalizations difficult. More specific instructions may be available from the grower. Some genera included are *Aspasia*, *Brassia*, warm-growing *miltonias* (often called the Brazilian type) and many of their hybrids. Rat-tail and mule-ear species have been segregated as *Trichocentrum* and the equitant to *Tolumnia*.

**LIGHT** needs can vary from bright to nearly full direct sun depending on the species. Most will thrive with one to several hours of sun a day. Generally, thicker-leaved plants, such as "mule-ear" and "equitant" oncidiums, can stand more light. In a greenhouse, 20 to 60 percent shade is required, or about 2,000 to 6,000 foot-candles, depending on the plants. In the home, east, south or west windows are ideal. Many types of oncidiums will grow under artificial light. Four fluorescent tubes supplemented with incandescent bulbs and placed 6 to 12 inches over the plants are necessary for proper growth. Metal-halide and sodium-vapor bulbs also provide sufficient light without needing to be so close to the plants.

**TEMPERATURES** for this group are generally considered intermediate to warm: 55 to 60 F at night, and 80 to 85 F during the day. Temperatures up to 95 to 100 F are tolerated if humidity and air movement are increased as the temperatures rise, a good general rule in any case.

**WATER** requirements vary with the type of plant. Generally, plants with large fleshy roots or leaves need less-frequent watering than thin-leaved or thin-rooted plants.

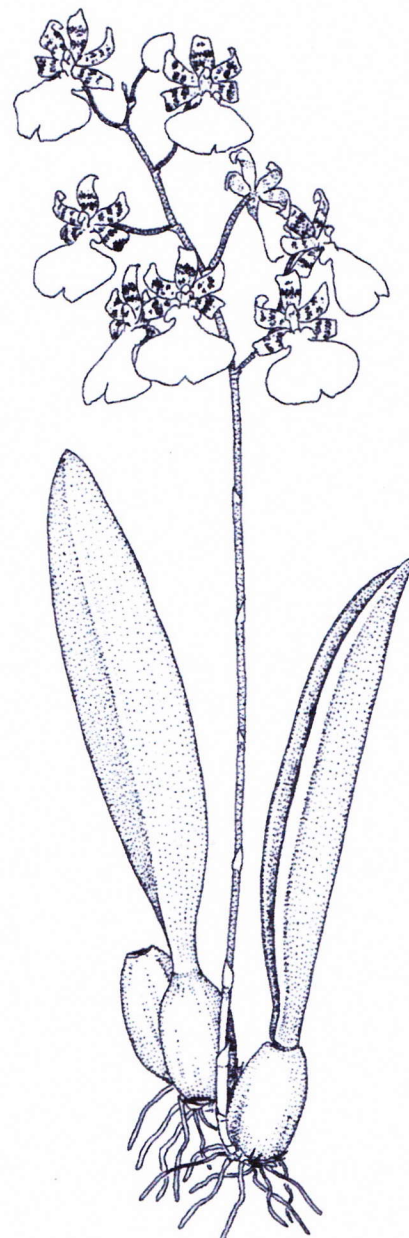
Watering should be thorough, and the medium should dry at least halfway through the pot before watering again. This may be every two to 10 days depending on weather, pot size and material, type of orchid and type of potting medium. Plants not actively growing should be watered less; many species have winter rest periods.

**HUMIDITY** should be between 30 and 60 percent. Many oncidiums require less humidity than other orchids. Most greenhouses have adequate humidity. In the home, placing the plants above moist pebbles in trays is ideal.

**FERTILIZE** regularly while plants are actively growing. Applications of 30-10-10 formulations twice a month are ideal for plants in a bark-based potting medium. A 20-20-20 formulation should be used on plants in other media or on slabs. If skies are cloudy, applications once a month are sufficient.

**POTTING** should be done when new growth is about one-half mature, which is usually in the spring. Fine-grade potting media are usually used with fine-rooted plants and coarser mixes with large-rooted plants; the standard size is medium grade. The plant should be positioned in the pot so that the newest growth is farthest away from the edge of the pot, allowing the maximum number of new growths before crowding the pot. Spread the roots over a cone of potting medium and fill in around the roots. Firm the medium around the roots. Keep humidity high and the potting medium dry until new roots form.

Equitant and mule-ear oncidiums, as well as other fleshy-leaved or large-rooted plants, can be grown on slabs of cork bark or tree fern or in pots filled with a coarse, well-drained medium such as charcoal. This allows the drying between waterings that these types need.



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## Novice Culture Sheet



### ***Paphiopedilum***

paff-ee-oh-PED-ih-lum

Paphiopedilums are often called 'slipper orchids' because of their unique pouch. They are easily grown as houseplants and their care is very similar to African Violets.

#### **Water**

How often you water will depend on whether your plant is potted in bark or a sphagnum moss mix and the amount of light and heat. Paphs need more frequent watering than some other orchids because they have no pseudobulbs to store water. Bark retains less water so will require more frequent watering - every five days is usually sufficient. If your plant is potted in moss, water when the top feels dry. Care should be taken not to overwater to avoid rotting the roots. Soon you will be able to tell by the weight of the pot whether or not it is time to water again. If in doubt, wait a day.

When you water an orchid you want to let the water run through the plant for a minute

or so. Place the plant in the sink and use tepid water. Be sure to let the plant drain completely. Do not use salt-softened or distilled water.

This is a good time to look closely at your paph for any sign of insects and to remove any leaves that have browned.

#### **Light**

Paphs belong to the 'low' light group of orchids. An east window is ideal; west or south windows can also be used if shaded with a sheer curtain. You can tell by the leaves if the plant is getting too much light. A reddish tinge on the edges means you need to provide more shade for your plant. If your paph does not re-bloom, it may not be getting enough light.

#### **Temperature**

Paphs generally enjoy the same temperatures that we do in the home; ideally, 60-65°F at night and 75-85°F during the day. Keep in mind that temperatures close to the window on a windowsill will be colder or hotter than your general house temperature. Paphs can be grown outside in mild climates. The plants can stand temperatures from 95°F to the 40s. Protect plants during cold temperatures by avoiding moisture on leaves or in the crowns and in summer from burning from the sun.

#### **Fertilizer**

Any balanced orchid fertilizer (look at the numbers on the container, 20-20-20, etc.) can be used to fertilize your orchid. Weakly (1/4 strength), weekly works well. Once a month use clear water to flush any accumulated salts from the potting mix.

#### **Tips**

Use a shallow tray of pebbles filled with water to increase humidity around your plants. Be sure the pot does not sit in water as this will rot the roots.

Give your plants room for air to circulate around them. Crowding of plants can lead to problems with insect infestations and fungus. A small fan will help provide good air circulation around your plants.

When the blooms are finished, cut the spike down to the level of the leaves. Continue watering and fertilizing and within a year a new growth will spike to begin the blooming cycle again!

When the plant has finished blooming is a good time to repot your orchid.

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# Paphiopedilum

Paff-ee-oh-PED-ih-lum

**P**aphiopedilums, the lady's-slipper orchids, originate in the jungles of the Far East including Indonesia. They are semiterrestrial, growing in humus and other material on the forest floor, on cliffs in pockets of humus and occasionally, in trees. They are easy to grow in the home in windows, under lights, or in the greenhouse.

**LIGHT** is easier to provide for paphiopedilums than many other types of orchids. In the home, they require shady conditions in an east or west window, or near a shaded south window. In the greenhouse, shade must be provided. Give about 1,000 to 1,500 foot-candles. Under lights, suspend two or four fluorescent lighting 6 to 12 inches above the leaves, or use the equivalent in LED lighting.

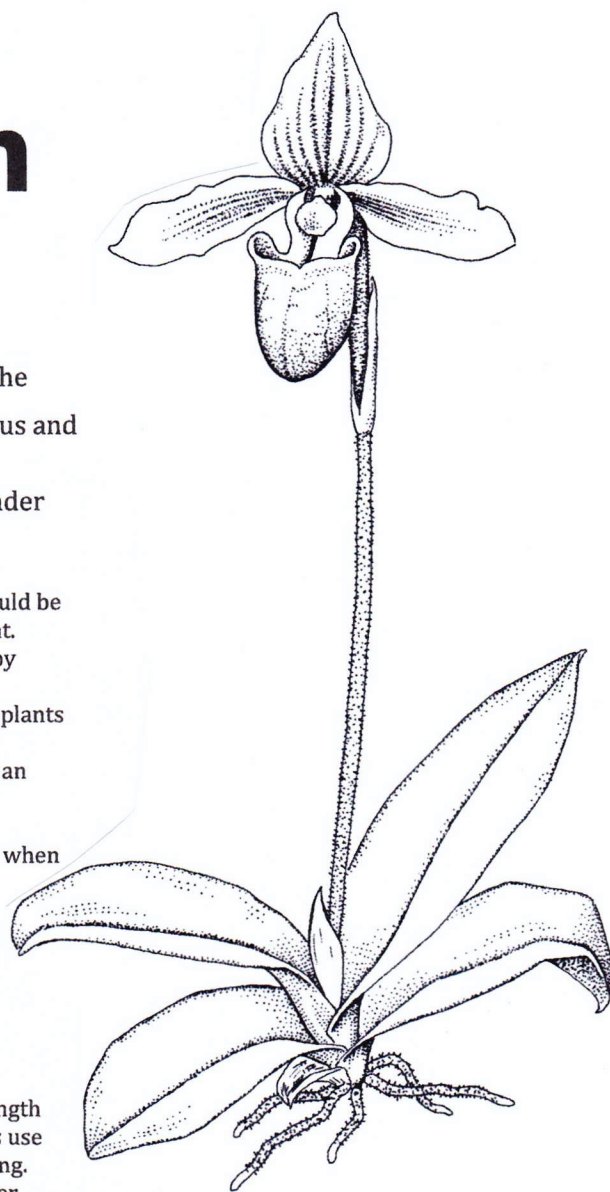
**TEMPERATURES** for paphiopedilums span a considerable range. Paphiopedilums are traditionally separated into two groups: the warm-growing mottled-leaved types and the cool-growing green-leaved types. A third, increasingly popular group is the warmer-growing strap-leaved multi-floral paphiopedilums. Warm-growing types should be kept at 60 to 65 F during the night and 75 to 85 F during the day. Cool-growing types should be kept at 50 to 60 F during the nights and 75 to 80 F during the day. However, many growers raise all plants in the same temperature range with excellent results. The plants can stand night temperatures in the 40s (as when grown outside in mild climates), as well as temperatures to 95 F. Care must be taken to protect the plants from rot when cold; keep humidity low and avoid moisture on leaves or in the crown of the plant. In addition, protect from burning when hot; shade more heavily and increase humidity and air movement around plants.

**WATER** must be available at the roots constantly because all plants in this genus have no pseudobulbs. All of these plants need a moist medium—never soggy, but never dry. Water once or twice a week.

**HUMIDITY** for paphiopedilums should be moderate, between 40 and 50 percent. This can be maintained in the home by setting the plants on trays of gravel partially filled with water so that the plants never sit in water. In a greenhouse, average humidity is sufficient. \*Using an evaporative cooling system in warm climates can increase the humidity. Air movement is essential, especially when humidity is high.

**FERTILIZE** on a regular schedule, but care must be taken to avoid burning of the fleshy, hairy roots. High-nitrogen fertilizers, such as 30-10-10, are recommended when potted in any fir-bark mix. In warm weather, some growers use half-strength applications every two weeks; others use one-quarter strength at every watering. It's important to flush with clear water monthly to leach excess fertilizer, which can burn roots. In cool weather, fertilizer applications once a month are sufficient.

**POTTING** should be done about every two years, or as the medium decomposes. Seedlings and smaller plants are often repotted annually. Do not overpot; pot size should allow for two year's growth. Mixes vary tremendously. Most contain fine or medium-grade fir bark and additives such as perlite (sponge rock), coarse sand and sphagnum moss. Moisture retention with excellent drainage is needed. Large plants can be divided by pulling or cutting the fans of the leaves apart into clumps of three to five growths. Smaller divisions will grow, but may not flower at first. Spread the roots over a small amount of medium in the bottom of the pot and fill with medium, so



that the junction of roots and stem is buried ½ inch deep in the center of the pot.

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## Novice Culture Sheet



### *Phalaenopsis*

fayl-eh-NOP-sis

If you are lucky enough to have a *Phalaenopsis*, you are about to enter the wonderful world of growing orchids! Phals are one of the easiest orchids to grow in the home. If you follow a few basic requirements, these plants will reward you with several months of beautiful blooms.

#### Water

How often you water will depend on the potting medium. Bark retains less water than moss. If your phal is potted in bark watering once a week is generally sufficient. If your plant is potted in moss, water when the top feels dry. The amount of light and heat your plant receives will also affect how soon your phal needs watering. Summer months will need more frequent watering, winter will need less. After a few waterings, you will be able to tell by the weight of the pot whether or not it is time to water again. If in doubt, wait a day.

It is best to water in the morning. Place the plant in the sink and use tepid water. Do not use salt-softened or distilled water. Let the water

run through the plant for a minute or so. Be sure to let the plant drain completely.

If any water remains in the crown (where the leaves join in the center) use a paper towel to blot the water to avoid crown rot.

#### Light

*Phalaenopsis* are 'low' light orchids. They grow beautifully in an east window and can be grown in a south or west window if protected by a sheer curtain. A phal's leaves should be olive green. If they are darker it means the plant is not getting enough light; red tinged leaves mean the plant is getting too much light. Once the plant is in bloom you can place it anywhere in your home out of direct sunlight. If your plant does not re-bloom, increase the amount of light that it receives.

Continue watering and fertilizing while waiting for the blooming cycle to begin!

#### Temperature

Phals are easy to grow because they enjoy the same temperatures we do – above 60F at night and a range of 70 to 80 or higher during the day. 95 F is the maximum temperature recommendation. Keep in mind that temperatures close to the window on a windowsill will be colder or hotter than your general house temperature. Fluctuating temperatures can cause bud drop on plants with buds ready to open.

#### Fertilizer

Any balanced orchid fertilizer (look at the numbers on the container, 20-20-20, etc.) can be used to fertilize your orchid. Feeding weakly (half strength) weekly works well. Once a month, use clear water to flush any accumulated salts from the potting mix.

#### Humidity

Use a shallow tray of pebbles filled with water to increase humidity around your plants. Be sure the pot does not sit in water as this will rot the roots.

#### Cutting the spike

When the blooms are finished, you can cut the spike down to the level of the leaves and the plant will bloom with larger flowers and a strong stem within a year. You can also cut off the stem leaving two nodes (those little brown lines on the stem below where the flowers were) on the stem. One of these nodes will then initiate and generally produce flowers within eight to 12 weeks. See the AOS video library at [www.aos.org](http://www.aos.org) (located in the *All About Orchids* section).

Continue watering and fertilizing while you are waiting for the blooming cycle to begin again! Repotting is usually done every one to three years.

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# Phalaenopsis

Fayl-eh-NOP-siss

*Phalaenopsis*, the moth orchid, is perhaps the best orchid for growing in the home, and is also a favorite with greenhouse growers. Well-grown plants can flower often, sometimes with a few flowers throughout the year, though the main season is late winter into spring. Average home temperatures and conditions are usually sufficient. Flower stems on certain hybrids can be forced to rebloom by cutting the tip off after the initial flowering. Only healthy plants should be induced to flower repeatedly. Based on DNA analyses, the former genera *Doritis* and *Doritaenopsis* are now synonyms with *Phalaenopsis* and should be grown similarly.

**LIGHT** is easy to provide for phalaenopsis. They grow easily in a bright window, with little or no sun. An east window is ideal in the home; shaded south or west windows are acceptable. In overcast, northern winter climates, a full south exposure may be needed. Artificial lighting can easily be provided. Four fluorescent tubes in one fixture supplemented by incandescent bulb, or the equivalent in LED bulbs, placed 6 to 12 inches above the leaves for 12 to 16 hours a day follows the natural day length. In a greenhouse, shade must be given; 70 to 85 percent shade, or between 1,000 and 1,500 foot-candles is recommended. No shadow should be seen if you hold your hand one foot above a plant's leaves.

**TEMPERATURES** for phalaenopsis should usually be above 60 F at night, and range between 75 and 85 F or more during the day. Although higher temperatures force faster vegetative growth, higher humidity and air movement must accompany higher temperatures, the recommended maximum being 90 to 95 F. Night temperatures to 55 F are desirable for several weeks in the autumn to initiate flower spikes. Fluctuating temperatures can cause bud drop on plants with buds ready to open.

**WATER** is especially critical for phalaenopsis. Because they have no major water-storage organs other than their leaves, they must never completely dry out. Plants should be thoroughly watered and not watered again until nearly dry. In the heat of summer in a dry climate, this may be every other day; in the winter in a cool northern greenhouse, it may be every 10 days. Water only in the morning so the

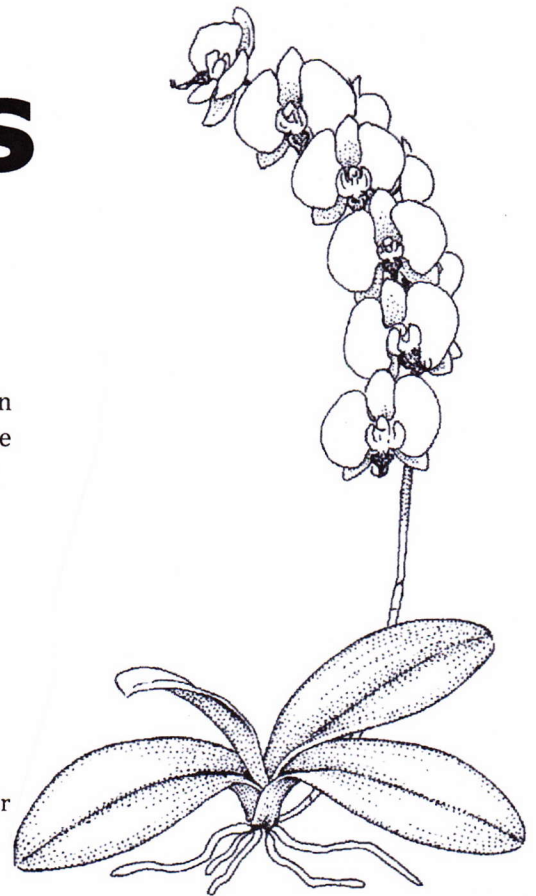
leaves dry, and do not let water collect in the crown to prevent crown rot.

**HUMIDITY** should be 50 to 80 percent for cattleyas. This can be provided in the home by placing the plants on trays of gravel, only partially filled with water so that the plants do not sit in the water. Air should always be moving around the plants to prevent fungal or bacterial disease, especially if high humidity or cool temperatures exist. In the greenhouse, the humidity is best increased by use of a humidifier. Evaporative cooling increases humidity while cooling the air.

**FERTILIZE** on a regular schedule when the plants are growing, especially if the weather is warm. Twice-a-month applications of high-nitrogen fertilizer (such as 30-10-10) are appropriate where bark-based media are used. Otherwise, a balanced fertilizer is best. When flowering is desired, a high-phosphorus fertilizer such as 10-30-20 can be applied to promote blooming. Some growers apply fertilizer at one-quarter strength with every watering; this is best for warm, humid conditions. With cooler or overcast conditions, fertilizer should be applied twice per month at weak strength.

**POTTING** is best done in the spring, immediately after flowering. Phalaenopsis plants must be potted in a porous mix. Potting is usually done every one to three years. Mature plants can grow in the same container until the potting medium starts

to decompose, usually in two years. Root rot occurs if plants are left in a soggy



medium. Seedlings usually grow fast enough to need repotting yearly, and should be repotted in a fine-grade medium. Mature plants are potted in a medium-grade mix. To repot, trim soft, rotted roots and spread the remaining roots over a handful of medium in the bottom of a new pot. Fill the rest of the pot with medium, working it among the roots so that the junction of the roots and the stem is at the top of the medium.

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# Stanhopea

stan-HOHP-ee-ah

**S**tanhopeas and related genera have large, pleated leaves and bear incredible flowers with intricate, complex structures and mechanisms for pollination, ranging from channeled walkways for insects to buckets of a watery solution. Most have inflorescences that grow downward, so the plants must be potted in hanging baskets or similar containers. Flowers are often spicily fragrant, and although the flowers are short-lived, each plant may produce many inflorescences throughout the year. Related genera *Paphinia* and *Peristeria* grow warmer than others in this group, and may produce upright inflorescences.

**LIGHT** should be bright, with direct sunlight diffused so as not to burn the leaves. Most growers suspend these orchids due to their pendulous inflorescences. This also brings the plants closer to the light. Light levels approximating those for cattleyas, around 3,000 foot-candles, are best.

**TEMPERATURES** should be moderate: 52 to 60 F at night, with day temperatures 68 to 75 F in the winter. Plants can stand short spells of higher temperatures, but air movement, humidity and shading must all be increased. Many species flower in the summer, and putting them outside in the summer may be beneficial. Move into higher light slowly to avoid burn.

**WATER** in ample quantities is important to produce strong pseudobulbs and prevent foliar spotting. Stanhopeas and their relatives can be sensitive to salt accumulation in the medium, so should never be allowed to dry out entirely, even during the winter months when growth may slow or stop. Poor watering habits are also conducive to root loss in these types, and some may be very slow to re-establish once they have lost their roots.

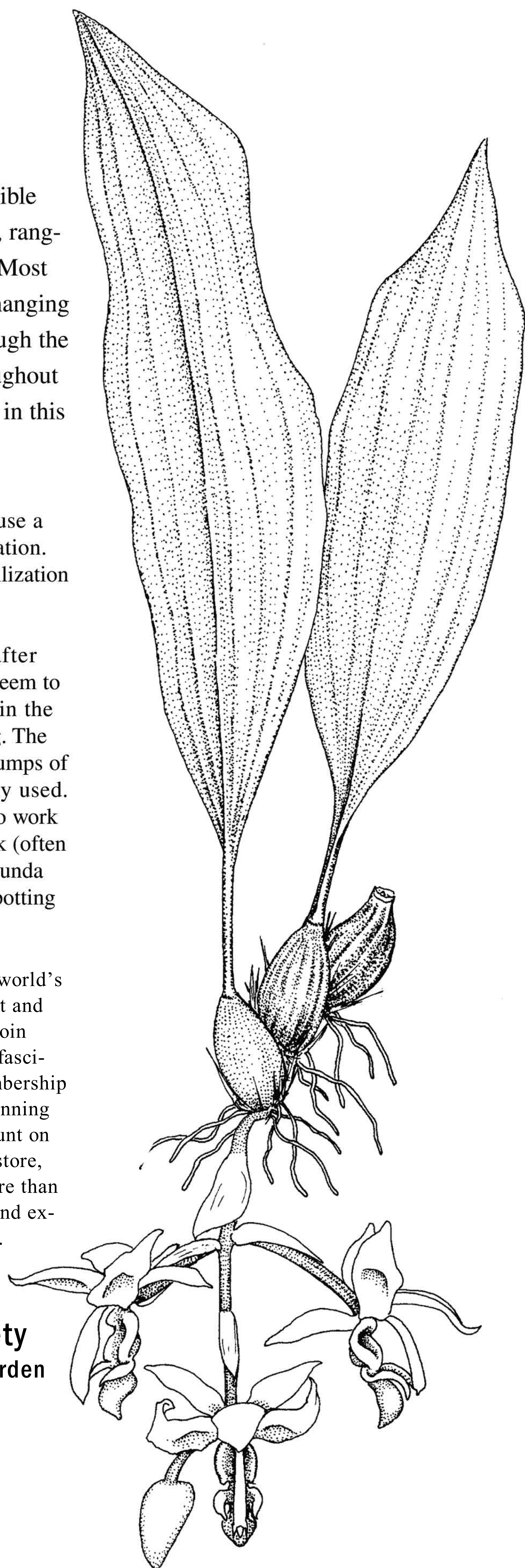
**FERTILIZE** at regular intervals. Most growers fertilize with a diluted concentration every week to two weeks. For plants in bark, use a 30-10-10 high-nitrogen formulation, alternating with a 20-20-20 balanced formulation; in the blooming

season, which is mainly summer, use a 10-30-20 blossom-booster formulation. Plants grown in osmunda need fertilization only infrequently.

**POTTING** is done best right after summer flowering, as most plants seem to grow year round. Plants that rest in the winter can be repotted in the spring. The best flowerings come from large clumps of plants, so large baskets are usually used. An airy, yet moist medium seems to work best, such as medium-grade fir bark (often mixed with sphagnum peat) or osmunda fiber. Vigorous plants may need repotting every three years or so.

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# Tolumnia

Toh-LUM-nee-ah

The key to Tolumnias (equitant oncidiums) is understanding their natural habitat. The species are endemic to the Caribbean Basin with many confined to a single island. Most are found in intermediate to warm conditions on twigs exposed to bright light and air movement. Humidity is high and heavy dews or rain showers occur daily. Air movement is constant and plants never remain wet for long. Today's hybrids offer an astounding array of colors and patterns. Petite size and adaptability to a wide range of conditions make them suitable for under lights or on windowsills. And wait ... don't cut off that spike after the flowers fade. A secondary flowering will often occur and provide several more weeks of bloom.



**Light** Bright, diffused light somewhere between that for phalaenopsis and cattleyas. Plants growing well but reluctant to bloom usually need more light. Tolumnias are fairly tough, but when moving plants to a higher light, do so gradually to prevent burning. This is especially true when moving plants outdoors for the summer.

## Temperature and Humidity

Provide intermediate temperatures (55 to 90F) and relative humidity of 50 to 70 percent. Plants grown in windows or under lights benefit from summering outdoors where climate permits.

**Watering** is the most crucial aspect to success with tolumnias. Plants must dry out between waterings. Drying will be faster outdoors than on a humidity tray in a windowsill. Damp, cloudy days retard drying, bright, breezy days hasten it. Mounted plants can be misted daily because drying is rapid. Pots must be observed more closely for complete drying. The adage "if in doubt, don't water" applies here. Do not mist or water during the heat of the day. Water trapped in the overlapping leaf bases can reach "cooking" temperatures and severely damage plants, especially tender new growth.

**Fertilize** with a balanced fertilizer applied every second or third

watering at half to quarter strength. Accumulated salts can damage roots, especially those of mounted plants, so flush with plain water between fertilizer applications.

**Potting and Mounting** Plants are best mounted. Twigs, cork bark, small wood or tree-fern plaques all work well. Moss or coconut fiber can be placed around the roots to help hold moisture. A daily light misting will help establish growth. If plants on mounts show a tendency to shrivel despite regular watering, pare off some of the mount without disturbing the plant and set it in a clay pot (with no medium). This may afford the right amount of extra moisture. If conditions remain too dry, sift potting mix into the container around the base of the plant. The medium used should be porous and drain readily. Repot in spring when new growth begins to assure quick re-establishment.

## Problems

Mealybugs, scale and aphids are typical pests and can be controlled simply by direct removal using a cotton swab soaked with ordinary rubbing alcohol. Wettable powder formulations of Malathion or Orthene (used according to manufacturer's directions) provide

efficient control. Cygon seems to be toxic to the plants and should be avoided.

Divide and repot plants larger than 3- to 4-inch pots unless grown in baskets. Decline of the center of large plants invites bacterial or fungal problems.

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# Vanda

VAN-dah

The *Vanda* Alliance is made up mostly of warm- and full-sun-growing orchids with colorful flowers. Originating in tropical Asia, they are easily grown in warm climates, where plants are cultivated outside in light shade, such as in a lath house. In climates where winters are cold, they are often summered outside, and grown inside during the winter in a sunny window, or year round in a greenhouse. Smaller growing ascocendas are best outside tropical conditions.

**LIGHT** is a crucial factor in blooming most vandaceous plants. There are three types of vandas: strap-leaved, semi-terete and terete. The first type has broader, flat leaves, while terete types have round, pencil-shaped leaves. The semi-teretes are hybrids between the two, with an intermediate leaf shape. Terete types need full sun, and are best grown in high-light climates. In a greenhouse, give the plants about 25 to 35 percent shade, less in winter if overcast. Leaves should be a medium green, not dark green. In warm, bright climates, you can grow any type of vanda outside (if warm) with partial shade for strap-leaved types and semi-teretes (especially in midday in summer) or inside (when cold) in a bright, south window. In climates where winters are overcast, try ascocendas. Grow them outside in summer and in full sun inside during the winter. Be careful to acclimatize plants to avoid burn.

**TEMPERATURES** for most vandas should be warm; a minimum winter night temperature of 55 F is recommended. Colder spells can be tolerated for a short time if it is not windy. Optimum temperatures are 60 to 70 F at night, and a maximum of 95 F during the day. Warmer temperatures mean faster growth, which must be balanced with higher humidity, air movement, and increased water and fertilizer. Days should be warm and humid for optimum plant growth.

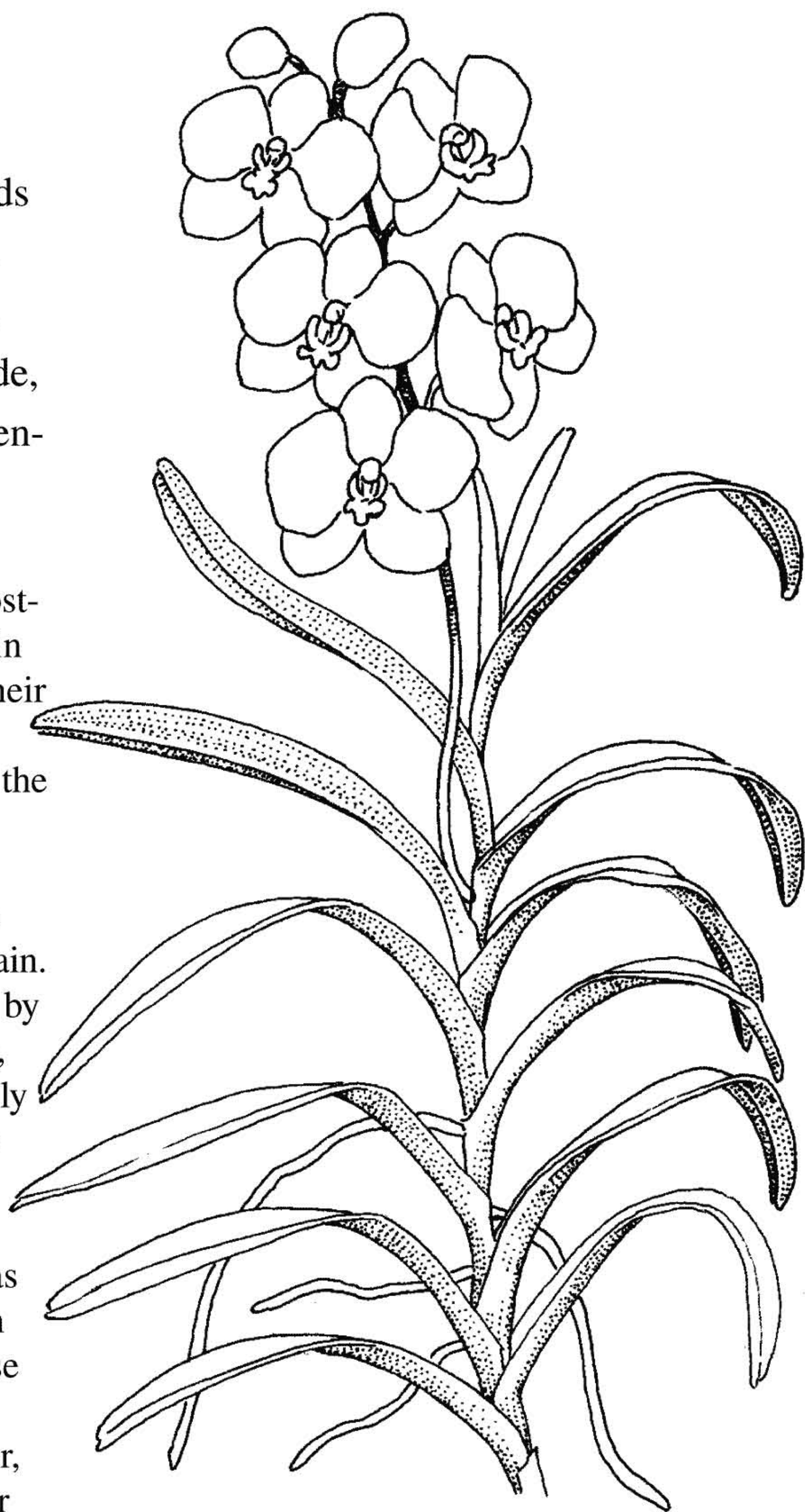
**WATER** should be applied copiously when the plants are growing, but the roots must dry quickly. Because of this, and

their extensive root system, they are mostly grown in slatted-wood baskets, or in pots with a coarse potting medium. If their situation is warm and sunny, they may need daily watering. Water sparingly in the winter or during cloudy weather.

**HUMIDITY** of 80 percent is ideal. In tropical climates this may be easy to obtain. In a greenhouse, this is easier to provide by using an evaporative cooler. In the home, place the plants on trays of gravel partially filled with water. Air movement must be strong.

**FERTILIZE** with a balanced (such as 20-20-20) fertilizer applied full strength once a week during warm weather or use a one-quarter-strength solution at every watering. During cool or cloudy weather, apply fertilizer once every two to four weeks. Use a high-phosphorus fertilizer (such as 10-30-20) every third application to promote flowering.

**POTTING** should be done in the spring. Plants in baskets do not need to be repotted often. Leave them unless the potting medium breaks down. Set the plant, with the old basket intact, into a container of water to make the aerial roots more pliable, and then set plant and basket into a larger basket. For plants in pots, repot in a slightly larger pot, positioning the plant in the center. Use a coarse medium, whether fir bar, tree fern or charcoal, and work it around the roots. Keep shaded, humid, but drier at the roots until new root tips grow. Do not overpot.



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