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# *Vanda* Culture and Cold Protection

*Ascocenda* Motes Flamboyant "Crimson"

# *Vanda* Culture

Of all the major horticultural genera of orchids, vandas are the most recent to acquire prominence. Over the last forty years, an increasing sophistication in their culture has taken place in both the tropics and in more temperate areas. Many growers have mastered the requirements of these plants to the degree that many impressive specimens have been displayed and awarded. Still, the skills necessary to grow vandas to a high degree of perfection are unfortunately still the property of a relatively small group of growers and are not so generally known as with other genera. Luckily, vandas are very tolerant plants and easily grown in a fairly rough-hewn way, repaying even moderate attention with disproportionately fine shows of flowers. This inherent vigor makes vandas rewarding even for the novice grower. On the other hand, no other genus profits so dramatically from exacting culture as vandas. Poorly grown plants are frequently not recognizably the same as the identical plant grown well. The success of a certain small number of growers in obtaining large numbers of awards and trophies largely reflects their sophisticated skills in growing them to their full potential. Attention to detail is the key to having vandas that perform at their finest.

While vandas share numerous similarities in cultural needs with other genera such as cattleyas, *Phalaenopsis*, and dendrobiums, they also have numerous significant differences. Like *Phalaenopsis*, vandas have no bulbs for long-term water storage and grow more or less continuously from a single growth point. Unlike *Phalaenopsis*, *Vanda* roots absolutely require periods of drying. This trait, shared with cattleyas and dendrobiums, (although to a lesser extent), is an adaptation to bright, airy

Vandas produce an abundance of adventitious, truly aerial roots.

natural environments where they are found in nature. They are to a large extent truly "air plants" dependent only on their thick roots and waxy leaves to withstand environmental stress.

Understanding the special requirements of vandas is not difficult for experienced orchid growers once their unique character is grasped. Luckily, vandas are by nature cooperative, vigorous plants. The goal of good *Vanda* culture in both tropical gardens and temperate greenhouses is merely to reproduce the conditions that create this naturally robust growth and, if possible, to exceed nature. The key is always to avoid stressing vandas with any adverse environmental conditions. Vandas that are kept stress-free and uninterrupted in their growth produce such an abundance of flowers of such superlative quality that those who have seen them are seldom satisfied with the productivity of other orchid genera.

# Warmth

Warmth, more than any other factor, is the *sine qua non* of vigorous growth for vandas. They thrive best in temperatures between 60° F (15° C) and 90 F (33° C) but will tolerate both slightly higher and slightly lower temperatures for considerable lengths of time. Both root and flower growth is most vigorous when night temperatures of 60-70° F (15-21° C) are combined with day temperatures in the 80-90° F (28-33° C) range. Slightly higher temperatures that maintain this 10 to 20 degree swing are also very favorable to excellent growth and flowering of vandas. In Florida this temperature span prevails for a good deal of the year, reaching near ideal ranges in spring and fall. Greenhouses and even the addition in winter of plastic films to pool enclosures or shade house easily enhance the prevalence of these ideal conditions in Florida through the winter as well.

While widely thought of as strictly warm-growing, vandas are, in fact, best grown at the warm end of the intermediate range preferring night temperatures in the upper 60s F (20° C) to low 70s (22° C) and day temperatures in the mid-80s F (28° C) to upper 80s (31° C). In Florida, the cooler inland areas with slightly warmer days and slightly cooler nights produce the best plants and flowers. Not by accident, the Redland with its wider day to night temperature swings produces more award winning vandas than Miami or Ft. Lauderdale. Similarly, in Thailand, the higher, cooler elevations up-country, such as Nakon Sawon and Changmai, excel over lowland Bangkok and environs. The most striking effect of cooler night temperatures is more brilliantly colored flowers. This added luster is caused by the resultant increase in anthocyanins which produce warmer, more intense blues and more electric pinks and reds.

Vandas are opportunistic plants; they grow lushly in favorable conditions but react to adversity by cutting their losses with a retreat into dormancy. In adverse environmental conditions, vandas become semi-dormant, ceasing both root and leaf growth. No factor will produce this dormant state faster than chilling. Vandas should never be chilled below 50° F (10° C) for more than a few hours. If *Vanda* leaves and root tissue are chilled below 50° F for a long period, the resulting dormancy that is induced can be dramatic. After one or two nights of chilling, this semi-dormant condition is quickly apparent in the cessation of leaf and root growth. Leaves no longer unfold from the crown, and the green root tips withdraw until only a pinpoint of green appears at their ends. Once fully dormant; chilled plants require a fairly prolonged period of warmth before they resume growth. At the start of winter, such a setback could at best delay growth by a few weeks, but if warmth is not provided on a permanent basis, the plants may not resume normal vigorous growth until spring, thus losing up to one-quarter of their annual growth. Prolonged or severe exposure to temperature well below 50° F (10° C) can cause even more dramatic damage. Under these temperatures, particularly with a little drought stress, vandas will start to shed their lower leaves. In the early days of their culture Florida growers simply expected to hear on those frosty nights the tinkle, tinkle of falling *Vanda* leaves. Vandas that looked like palm trees were the norm until plants from Thailand were widely imported with their leaves intact all the way to the base. Florida growers soon learned the Thais' secret was warmth.

In temperate greenhouses growers are advised to take care to place vandas in the warmer sections and avoid drafts to protect them from excessive chilling. In Florida gardens, patios and shade houses, vandas can often be even more at risk than in temperate greenhouses, because they are unprotected from changes in

the weather. Plants in exposed locations can be chilled rapidly by winds blowing over them at only marginally cold temperatures, *i.e.,* 50° F (10° C). In many areas of Florida where vandas are grown outside, cold fronts producing dormancy-inducing chills arrive frequently enough to effectively produce a cessation of growth dormancy in vandas several months out of the year. The first cold front of December in Florida puts the brakes on *Vanda* growth and the successive cold fronts if not ameliorated by a sufficient patch of warmth, deepen and reinforce the dormancy. Windbreaks of trees, hedges, plastic, or wood greatly reduce the rapidity of chilling so the plants spend less hours below their optimum temperatures. This protection from wind permits vandas to maintain growth during the cooler months. Covering the plants or moving them to warmer locations inside or out during cold snaps allows vandas to grow without interruption. Plants protected in this way will start into rapid growth sooner in the periods of warm weather that are characteristic of Florida winters. Because they have continued to grow new leaves, vandas will produce more flower spikes. The simple math is more leaf axils, more places for flower spike initiation. The additional strength of the protected plants will also permit them also to produce many more and finer flowers. Serious Florida *Vanda* growers do everything possible to protect their plants from cold and most growers with large collections end up with some sort of greenhouse to protect their treasured plants.

Although 50° F (10° C) is the threshold at which vandas are thrown into some degree of dormancy, the ideal minimum temperature is higher, 60° F (15° C). As temperatures fall into this range, plants deficient in nutrients can show some stress. In particular, magnesium deficiency becomes apparent as a reddish pigmentation of the leaves. In Florida, in addition to regular trace element fertilization, an application of magnesium sulfate (Epsom

Reddening of foliage is indicative of magnesium deficiency.

salts) when temperatures are expected to fall below 70° F (20° C), helps maintain plants at peak performance. This is best done in conjunction with potassium nitrate. 1 tbs of each per each should be applied once a month as a preventive and also when ever any reddening of the foliage occurs. When proper nutrition is maintained, night temperatures in the range of 55-70° F (12-21° C) are actually beneficial, leading to increased production of both roots and top quality flowers.

High temperatures, above 92° F (34° C) are particularly damaging on a prolonged basis for *Vanda coerulea* and its hybrids and, to a lesser degree, are bad for all vandas. Under such extremes, vandas have difficulty accumulating sufficient water and nutrients. In many tropical and subtropical areas, extreme daytime temperatures are abated by clouds or showers. In "sunny Florida" particularly in late spring this cloud cover affect is absent. Heavy misting or syringing in garden or greenhouse can mimic these conditions, providing extra water and, most importantly, lowering leaf temperature when temperatures are peaking in late morning or early afternoon. When their leaves are cooled in this fashion, vandas can subsequently withstand several hours of higher air temperature.

# Watering

Vandas require large quantities of water. A substantial portion of the total weight of a healthy *Vanda* is in its root system. These highly absorbent, sponge-like roots are the principal water storage organs. They are capable of gathering and retaining water but also require periods of dryness in order to maintain their health. When sufficient drying does not take place, vandas are prone to root rots caused by the ubiquitous fungus, *Fusarium*. In addition to destroying roots, this fungus can enter the stem and progress upward until the entire plant is destroyed (see page 98 for diagnosis and control). Even if fungus is avoided, roots kept constantly wet are reluctant to throw new root tips and, hence, are unable to supply enough nutrients to new vegetative growth. This leads to the eventual decline of the entire plant. Over watering and improper watering are the chief causes of poor results in the culture of vandas.

Vandas should be very heavily watered, to the point of saturation. Although light mists are sometimes beneficial to cool plants in exceptionally hot weather, excessive misting can wet roots without saturating them, leading to weakness and disease. Vandas that receive the bulk of their water from frequent misting, produce thin stringy roots in contrast to the thick healthy roots of properly watered plants. Judging when to water vandas is dependent on several factors: light, temperature, air movement, and growing media are all critical. Close physical observation of the plants on a daily basis remains the best method to ascertain the plants needs in its particular circumstances and present environmental conditions. The media and containers in which the plants are grown also affect the watering schedule. Vandas grown in bark

in plastic pots require less frequent watering than plants in the same media in clay pots. Similarly, plants in slatted baskets filled with bark or lumps of charcoal require less-frequent watering than plants grown in bare wooden baskets. The age and quality of the media can also be a factor. Although careful growers choose only the best and most lasting media, all eventually break down. Plants in deteriorating media require a reduced water supply. Exposure to light is also a critical factor in determining the watering regime. Plants grown in bright light (above 4500 fc) need more water than those grown in dense shade, where metabolism is slower. In bright light, vandas show drought stress by becoming pale green or even yellow. Leaves of severely drought stressed vandas will fold in upon themselves and take on the wrinkled appearance of an old apple skin. Having arrived at this advanced state of drought stress vandas will start to shed their lower leaves. In exceptionally bright light and great heat and under clear skies, vandas may need watering as frequently as twice a day. Watering at 10:30-11:00 (rather than early) on mornings when the temperatures are expected to be high and the relative humidity is low is the best practice. Late morning watering cools the *Vanda* leaves and permits their stomata to remain open longer and absorb more carbon dioxide. Another effective strategy for vandas under heat and drought stress is to water in the afternoon when temperatures peak, but early enough so that the plants are dry before evening. In Florida this is usually about 4:00-4:30 on spring days in late March to

Drought stressed leaves.

early May. Watered at this hour, the roots are saturated with water that the plant can slowly absorb across the cooler hours of the night. This practice can be implemented two or three times per week in the hottest and driest of Florida spring weather.

Air movement also has a dramatic effect on the water requirement of vandas. When exposed to strong wind or other air movement, vandas are particularly vulnerable to drying. Often a large portion of their root mass is directly exposed on open baskets or clinging to the outside of pots. In such circumstances, vandas require frequent and heavy watering. In late March through mid-May in Florida, vandas will often require a second watering in mid to late afternoon. Other atmospheric conditions also affect watering patterns. When relative humidity is low and temperatures are high, drying occurs more rapidly. As temperatures are increased and as air movement increases, the drying effect of low humidity is increased exponentially. Strong air movement, high temperatures and low relative humidity are the conditions that are typical of Florida Spring. These conditions can often leave *Vanda* roots so dry that they begin to behave like a cork in a wine bottle and repel rather than absorb water. Vandas that have gone unwatered for several days in spring usually require extra attention to thorough watering for several days. Whilst they present challenges, such conditions also present opportunities. The rapid drying conditions of Florida spring suit vandas to the ground if the grower provides them with sufficient water and fertilizer for this highly energetic environment. With conditions dictating that they be watered more than seven times per week, vandas can also receive liquid fertilizer at every fourth to fifth watering.