

IS AIR MOVEMENT REQUIRED IN GREENHOUSES?

FRANK FORDYCE

Without doubt there are technical advisors who could answer this question far better than I; however, as a grower who has observed greenhouse conditions for some time I have certain theories I feel justified in discussing.

Frequently, new hobbyists will complain about the lack of growth and flowers in their collection. Perhaps they had purchased a beautiful cattleya in bloom and it has never again produced the same quality of size of blooms remembered.

It is my opinion that frequently these conditions are caused by a lack of air circulation within the glasshouse. Perhaps, plants are crowded together because of a lack of bench space, thereby reducing air movement at plant level. Some houses are so heavily shaded the temperature seldom rises to the point where the hobbyist feels the need of ventilation for its cooling effect and therefore runs a closed house with little or no fresh air movement. Rebecca Northen, in her excellent book *Home Orchid Growing*, covers the subject of plant respiration and growth in a simple direct manner that all can understand. We quote from the chapter on Adult Cattleyas, Temperature, Humidity and Light:

"Plants do not keep accounts, but if balance sheets were published for them, they would be quite similar to those you receive from the bank each month. If you spend more than you earn, you end up in debt. If you earn more than you spend, you have money left over for savings, and philosophically savings mean better living. The earning of plants is the food they make, and their spending is the food they use for energy. Their savings go into growth and flower production, with a reserve kept over toward launching the next season's growth.

During the day a plant carries on three activities: the making of food (sugar) for which light is necessary, the use of food (respiration, similar to our own use of food for energy), and growth. At night no food is made, but respiration and growth continue, drawing on the food made during the day.

Temperature regulates the rate of the plant's activities. Low temperature slows down the processes; rising temperature speeds them up, although not all at the same rate and not indefinitely. The reason behind what we call an optimal temperature range is that within this range the plant can carry on all of its life processes in a normal way, with no one activity out of balance with the rest.

The ideal night temperature chosen for a particular kind of orchid is the temperature at which growth

and respiration are in good balance so that the plant makes good growth without using too much of its food reserve. For Cattleyas this is between 55° and 60°. At lower temperatures growth is slowed down; at higher temperatures there is a tendency for respiration to exceed growth and for the plants to become depleted.

With abundant light, food making increases as the temperature rises up to about 85°. The day temperature should ideally be about ten degrees higher than it is at night. In the winter and in cool weather, this is easy to maintain. Problems come with hot weather. The plant's activities remain in pretty good balance up to about 85°, but over this the equilibrium is upset. With higher temperatures there comes the danger of burning and finally death. Plants can tolerate 95° for a few hours, and 100° for shorter intervals, but when the temperature rises above this the situation rapidly becomes critical, for the lethal point is not far off.

There are ways to modify the greenhouse conditions with shading, ventilation, humidity, and air circulation, so that we can pretty well control the environment. We don't wait for extremes to arrive, we anticipate them, and we use the various means in coordination with each other throughout the year so as to give the plants a good balance of the various factors; a balance between day and night temperatures, between the amount of light and the day temperature, and between humidity and all the other factors."

Air circulation is vital to the growing of healthy plants for they absorb the carbon dioxide through the leaf stomata that in turn is made into sugar, which can be literally called the food of the plant. If no air circulation is provided the carbon dioxide immediately surrounding the surface of the leaves is depleted and the plant, starving for carbon dioxide, is literally gasping for air, its respiratory balance upset.

Every day, winter and summer the air in your greenhouse should be kept in circulation. During the night it prevents the layering of hot and cold air and prevents build-up of dead air pockets in the corners. During the day, when carbon dioxide is needed to manufacture food, fresh air that normally contains at least some carbon dioxide should be introduced into the house with fans circulating and exhausting the air.

The more crowded your glasshouse becomes, the more important air circulation becomes.

Let's all put air back into circulation!