GROWING PALMS

Horticultural and practical advice for the enthusiast

by Randal J. Moore

Growing Palms in Containers

We all attempt to achieve the ideal conditions for container-grown palms. We want a potting mix that provides good aeration. At the same time, the mix should not dry out too quickly and should maintain a relatively even moisture level. We wish there were one ideal mix that could be used in all pot sizes, from small plugs to large containers, and from short to tall pots. It would also be good if the perfect mix contained the necessary nutrients needed by palms. A single perfect mix would work for all species of palms. And, finally, it can be stored indefinitely without deterioration.

These ideal conditions are very difficult, if not impossible, to achieve. This would mean that the container mix is not affected by other environmental factors. It also implies that the substrate used does not change with horticultural practices. This article will discuss the over-reliance on the potting mix as the main factor that determines good aeration and moisture level in container-grown palms.

We tend to make errors to the detriment of our palms when we consider the composition of the container mix as an over-riding and isolated factor. Importantly, the potting mix is not totally responsible for meeting the air, water and nutritional needs of the palm. We should take an integrated approach to the four main factors associated with the container growing of palms in order to properly balance aeration, saturation and nutrition needs.

Balancing the aeration and moisture levels is a considerable problem when palms are grown in containers. When growing seedlings in small pots or cells as plugs, they are often too wet and die (often from fungal infections called “damping off”). As palms mature and grow and container size increases, they can dry out too quickly. Growers must compensate for changing demands as the palm matures. The aeration and moisture level is not a fixed property of the container mix.

Four major integrated factors discussed below will determine the combined air and water levels in palm containers. They are: the growing medium composition, the container size and shape, handling practices when filling containers and irrigation practices.

Factor 1: Growing Medium

Experienced palm growers know that the potting mix can greatly influence the air and water levels within the container. Different commercially available pre-blended mixes differ in porosity. Most commercial mixes used for containers containing a 50/50 blend of peat/perlite have a porosity of 80–90%. By contrast the porosity of unamended mineral soil is about 50%.

The peat used in the container mix will determine aeration and drainage. Sphagnum peat is preferred over other types (such as root-sedge peats) because of its beneficial fiber structure. Avoid peat that has been milled too much since the fibers will be crushed excessively causing the quality to be reduced. Coir dust is an acceptable substitute for peat. If a bark is used instead, it should be well composted. If the bark is not composted it will absorb nutrients during decomposition making them unavailable to the palms.

An aggregate is generally added to the container mix to improve aeration and drainage. Most commonly used are vermiculite, perlite or polystyrene beads. The aggregate is usually added in

a ratio of 20–60% by volume. The size of the aggregate is very important. Horticultural grade #2 vermiculite or perlite is the most commonly used. The coarser grade is appropriate for all containers except very small cells used for growing plugs. Plug mixes use a #3 aggregate that is finer making it easier to fill the small cells. However, #3 grade aggregate is inferior for aeration and drainage since it is more easily compacted.

The proper growing medium is based on the size of the container to be filled. If the container is small, the type of peat used is very important (and less so if the container is large). The aggregate used will determine aeration and drainage based on the size and shape of the particles. Small particle aggregates can actually be detrimental to good drainage.

Factor 2: Container Height/Shape.

Air and water content is of less concern in larger containers but is accentuated for smaller containers. From this perspective, growing a small plug is more difficult than growing a large container palm.

Small containers suffer from two problems: they are too short and too small. Since they are short, they do not drain well or do not drain at all. Airspace is reduced as a function of volume. A sample of one-part peat/one-part perlite contains: 0.5–2.5% air space by volume in a plug tray, 13% in a 4 × 4 inch pot, and 20% in a 6 × 6 inch pot.

A normal plug tray is 1 inch tall and provides between 1% and 3% air content. If the cell is increased to 2 inches tall, the air content increases to 5–10%. Therefore, increasing the plug cell height cuts production problems measurably. In smaller cells there is a much greater chance of underwatering or overwatering the small palm. This relates to a condition known as the "Perched Water Table Effect." After receiving irrigation, there is a portion of the medium at the bottom that does not drain. These pores remain saturated with water. This saturation zone is a greater portion of the total volume in shorter containers. The effect holds true for different height containers filled with the same

1. Container shape affects total volume. A square container has about 33% more volume than a round container of the same height and diameter.

substrate. The height of the container determines the air space left in the substrate after the drainage of excess water.

Container shape is also important. Smaller palms can be grown in both round and square containers. A round container is actually a portion of a squared conical container. Square tapered containers are somewhat pyramid shaped. They may be preferred because they have greater volume. Comparing the volumes of each, a squared container will have a 33% larger volume than a rounded one (Fig. 1). This extra volume allows more water to be available to the palm with less chance of drying out. Extra volume does not necessarily increase the air space percentage. As long as the height remains the same for both (square and round) there is no decrease in drainage.

Factor 3: Growing Medium Handling.

The grower's handling of the potting mix impacts its air and moisture levels. Much of the benefits from using the best materials, thorough blending in the correct proportions and careful packaging and shipping can be undone by poor handling practices.

Containers should be lightly filled and any excess removed. The mix should not be packed down into the container. One way compaction occurs is when the pots or trays are stacked onto one another. Air space can be reduced by one-half or more through such compaction.

Attain the proper moisture content of the mix prior to filling the container. After adding water to the potting mixture the mix hydrates and swells. The particles do not nest within each other as much. This process helps to create more aeration. The effect is not so dramatic when using larger containers but is important for smaller containers.

Not properly hydrating the container mix prior to use is a common mistake. Most growers immediately use a pre-blended commercial mix right out of the bag. However, water should be added prior to use. To assure proper absorption, it is best if the substrate is moistened, blended and stored overnight prior to use. However, even a few hours wait time is beneficial.

There are some general guidelines for hydrating the potting mix. When filling larger containers, use one part water to one part dry mix. This will yield a moisture level of 50%. For smaller containers, use a ratio of two parts water to one part dry mix. This produces a moisture content of 67%. Surprisingly, increasing moisture levels from 50% to 67% will double or triple the air space. This resultant mix may appear to be too wet based on standard practices; however, it will greatly improve aeration.

The calculation of how much water to add will be based on the initial water content level of the mix. The initial water content is the difference between the dry weight (measured by baking in an oven and weighed, if necessary) and the initial moist weight of the substrate. The calculation is also based on the dry bulk density (measured in pounds per cubic foot). Less dense mixes will require less water to produce a certain moisture level. The reverse also true for mixes of greater density where more water is needed. (For reference, a mix of 50% peat and 50% perlite has a dry bulk density of 6.25 lb/cu ft.)

Adding the correct amount of water to the mix before use will reduce the amount of watering needed afterwards. Light misting may be all that is required as opposed to heavy watering if the moisture content is properly attained prior to filling the container.

Allowing the potting mix to dry out during handling will require remoistening before use. This is detrimental. Of course, this frequently happens when the entire amount of mix is not used at a single time and is allowed to set out overnight.

Factor 4: Irrigation Practices.

Watering practices influence the air content in the root zone. As discussed above, small containers are especially susceptible to over-watering because they do not drain well. Therefore, knowing when to apply water is a very important consideration, especially when watering small containers.

The amount of irrigation water provided is the product of the amount of water applied by the frequency of application. For the optimal levels of aeration and water content, the general rule

is that as the container size decreases the volume of water should be reduced and the irrigation frequency increased.

Also, the smaller the container size the smaller the droplet size and water pressure to reduce the amount of planting mix that will be pushed out of the container when watering. Use special gentle heads on the end of water wands. If overhead irrigation is used in the greenhouse, the spray heads should produce a finer mist.

Conclusions

Understanding the four main factors described above will improve the quality of all container grown palms, from seedlings to larger sizes. The four factors are integrated and must be considered together when attempting to optimize air and water levels. One of the four factors cannot be changed without affecting the other three.

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