



At the root of healthier plants

At the Root of Growing Healthy Orchids

By

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Orchid culture may seem challenging, especially to inexperienced growers. Growing orchids however, can be modelled on an equation of various parameters. The main elements involved in this equation are: *fertilisers, growing media, water, light* and *temperature*. On top of each of these elements there is one other essential aspect: *time*.

A good grower prefers to make changes to these elements in their own time; not let the growing environment change them. If any one of these elements changes during growth, we must alter all the other factors in the equation to allow the plant to compensate for that change.

Each type of orchid likes suitable ranges of each element. Each one of these elements has an 'acceptable range'. These acceptable ranges may easily overlap to allow the plant to grow well in many climates. Each also has an 'optimal range' where the plant will grow at its maximum capability if given the chance. These ranges can be extremely wide (e.g. a wide temperature range) or very narrow (e.g. specific preferred moisture).

The most important question of any orchid grower is: *"what do my orchids require and what are their requirements to grow well?"* If you know the answers and can provide the plants with its requirements, it will reward you with excellent growth. As Francis Bacon said in the XVIth century 'scientia potential est' better known as 'knowledge is power'.

The Table below presents a variety of potting media used for growing orchids. The different mediums have very different amounts of air and hold various amounts of water. Each medium type will be suited to a different growing situation.

Table 1:

Component	Air retention in % of the volume	Water retention in % of the volume
Pine bark – Europe – 10mm – fresh	40	3
Pine bark – Europe – 10mm – one year	32	12
Pine bark – Europe – 10mm – two years	24	27
Sphagnum moss NZ not tightly packed	41	32
Sphagnum moss Chile not tightly packed 1 year	33	41
Rockwool cubes	30	51
Rockwool cubes – two years	19	Over 60
Orchiata – Power size	35	18
Orchiata – Power size – 1 year	32	20

Table 1: shows the percent air retention at potting of each media type (column 1) and the amount of water as a percentage of the total volume which is held within the media. Both values are dependent on particle size, ability to absorb water and their breakdown over time.

Although extremes are not desirable, extreme examples help to understand the effects of changing parameters and to gauge what an acceptable range is. This leads us to ask *"what could be considered an optimum root system?"* The root system of a plant must be as extensive as possible; they are the key to proper nutrition. However the roots are also the weakness of the plant too. They are the entry point of many root diseases. If surrounded by disease contaminants such as fungus or bacteria they lead to the plants demise.

It is well known that root disease is the main cause of plant death or unexplained sickness. A single root contaminated by fusarium can cause a multi-growth paphiopedilum to look chlorotic with poor leaves. Pythium entering a phalaenopsis root can kill the plant within two days. This disease acts so fast that most growers will mistake this as bacteria.

Some media types provide excellent growing conditions when first used for potting. However, the media may change very quickly due to breakdown which leads to increases in salt retention, pathogen growth, increased water holding and reduced air. Using a medium which is more stable over time can help to control orchid growth. Therefore this makes the growing management easier for any grower as well as keeping the growth factors within acceptable ranges.

In using any of the media types outlined in the table above you have to provide the right fertiliser and irrigation strategy as the different types of media will buffer and retain/supply water differently. E.g. if there are two phalaenopsis plants of similar leaf size grown in two different media – one in coarse charcoal and one in Sphagnum moss, the roots will grow differently.

As an example, charcoal does not retain water well, therefore irrigation will need to be more frequent to provide both water and nutrients to the roots. The plant may end up producing more roots to provide a higher amount of surface area on which to absorb water and nutrients required. Both the leaves and the roots will become tougher which helps prevent water loss. Phalaenopsis will also grow tougher aerial roots in other potting types too, these roots allow the plant to survive well and cope with extremely dry conditions. However under stress the plant will not grow to its optimum. Many growers also believe that charcoal can 'freshen' the medium but it has been shown that over time charcoal may absorb salts and water impurities. This may have a detrimental effect on plant growth after six months.



For plants grown in Sphagnum moss and rockwool where there is good moisture and nutrient availability, the roots do not have to go far in search of water. The roots will be softer and able to take up nutrients and water more easily as it becomes available. The roots will not require fat 'skin layers', technically known as 'valamen' as the water is constantly available. Overall growth will be fast and the plant is likely to produce fewer roots in a 'lazy' manner. Irrigation will not need to be as frequent as the medium does not dry out as quickly. However these roots are not protected from dry conditions as they are soft so the plant must never dry out or the roots will shrivel. Plants such as this are not able to withstand small amounts of stress e.g. in the orchid growing industry these plants may not transport well and not last as well if not looked after properly by the consumer.



In between we have Orchiata which is a matured *Pinus radiata* bark chip. This type of medium allows good air moment around the roots while still providing water and nutrients to the plant. Above all else the medium changes little over time. It is media like this that more growers are moving to because they are able to control growth factors more easily and keep them within the acceptable ranges. These plants grow well and are resilient to many environmental factors and root disease.



In looking at how an orchid plant responds to the medium in which it is grown, you, the grower, will be able to determine the acceptable range for all the growing parameters. Therefore avoid the more difficult extremes. If you use Orchiata, you have a media that is standardised and an indispensable tool to assist you in the successful cultivation of your orchids. The best growing medium is the strongest foundation for a strong and beautiful plant.