

3300 Benefits of Pacific Wide Orchiata™: Special attributes

There are many types of bark based products throughout the world. Different products are available and produced from different species of bark, from different countries and with different methods. To produce high quality growing media especially for the high profile growth of orchids and other epiphytes, certain procedures must be carried out to provide qualities to the media that aren't found in other media types. Pacific Wide Group prides itself by producing a product unlike any other via a specialised 11 Step Manufacturing Process. Along this process strict quality control and specialised aging & screening techniques produce a product already superior than other orchid media's. There are however other attributes of Besgrow™ Orchiata™ that make the product the most professional product in the world.

3300.1 Pure *Pinus radiata*

As explained in earlier sections of this manual (Information on Bark) the type of bark that is used to produce growing media is one of the most important aspects for the overall quality. Orchiata™ is produced solely from *Pinus radiata* bark, one of the most stable bark types in the world. Because New Zealand has large expanses of man made *Pinus radiata* forests there are large supplies of this potential media available for growing media production. We select bark from mills that use only a ring de-barker which means the bark is stripped from the log in large nugget form. It is essential that we source bark that is 100% *Pinus radiata*. Bark such as Douglas fir or Eucalyptus is not wanted as it causes the material to break down too quickly when used. We are the only processor which demands stringent raw bark requirements.

3300.2 Different Grades for different plant types

As different types of plant require different volumes of air for growth it is essential that the right media is used to grow those particular plants. For this purpose Pacific Wide Group produce a range of Orchiata™ grades for different plant types. The chip size ranges from a very fine 3-6mm through to a 12-17mm chip. There are also nugget sizes larger than this for other purposes. These different grades of bark cater for both juvenile and mature orchid varieties that are often grown in very different types of media. Large mature plants are grown in grades of around 9-12mm. Use of the right growing media for the plant type allows for easier management of both water and nutrition. This can cut management costs and allow the grower to spend more time focussing on producing high quality plants using heat and light while having a quicker maturing time.

3300.3 Specialised testing

We declare that our products are top quality and can be used as a management tool for growing top quality orchids. To ensure that our products always leave the processing plant in good condition we have stringent testing and quality control on each batch of product (3.0 Quality Control of Orchiata™). This includes:

- Product contamination checks throughout processing and bagging
- Samples are taken from each grade in each shipment and analysed chemically. A sample of each batch is also stored as a reference for one year.
- Random samples of shipments are taken throughout the year for particle size, pathogenic and nematode testing.
- Toxicity testing of the product using sensitive seedlings

It is essential that product leaves our facility in perfect condition. We know how important growing media is for the high quality growth of plants so we spend a lot of time making sure that the product is as good as we say.

3300.4 Dolomite addition

An important attribute of Besgrow™ Orchiata™ is the addition of natural New Zealand Dolomite lime. Dolomite is a naturally occurring mineral found in certain areas throughout the world. It is made from calcium magnesium carbonate and is an essential compound for enhancing the growth of plants in both horticultural and agricultural applications.

The application of dolomite has two advantages:

- pH adjustment of media
- prevent salt accumulation in the media
- added calcium and magnesium for plant growth

pH adjustment:

It is well known that when bark is in its raw form, the pH can be very low (down to 3.5). As bark is turned into growing media by either aging or composting, the pH increases by one or two units. However because of seasonal change in tree growth as well as structural changes during production the pH fluctuates in the end product. The pH can be anywhere between 5.0 and 6.5. To streamline the pH of the final product and bring it up to suitable levels for growing orchids we apply a designated amount of dolomite per m³.

Through years of research and experience, it has been found that most orchid types prefer a media with a pH range between 5.5 and 6.5. As orchid plants grow, their growth drops the pH within the media which will eventually affect the uptake of other nutrients by the plant. The addition of dolomite initially increases the pH to a suitable level for the plant but also acts as a pH buffer for months to come.

Dolomite works by reacting with the acid in the media. The calcium and magnesium carbonates that are present in dolomite react with water to form hydroxyl ions. These ions then react with acid ions within the media to form water and ultimately increasing the media pH.

The dolomite is applied as a powder with the main bulk of the particles 1mm or less with a certain proportion up to 3mm. Dolomite is a slowly soluble material which means that its reaction (or breakdown) is dependent on both its particle size and the amount of acid that is in the material it

is added to. Most of the dolomite applied reacts with the media in the first week after application. The larger particles however take longer to react and therefore add a long term pH adjuster to the media. As the dolomite is able to keep the pH high for a longer period of time the material becomes buffered against pH drop that can occur once fertilisers are added to the media. Growers must remember though that after a good length of time (around 9 months), the dolomite effect will have begun to wear off and growers must reapply dolomite or other liming compounds to maintain optimum plant growth.

Accumulation of salts:

Salt accumulation in any bark based media can be a problem. Often media that has been composted will have a much higher surface area and therefore a higher cation exchange capacity (CEC). The CEC shows how many cations or salts that can be held within a media. Often potassium and sodium ions fill these sites and eventually accumulate which can harm plant growth.

Although Besgrow™ Orchiata™ has a low CEC and does not accumulate salts, the addition of calcium and magnesium in the dolomite form produces free calcium and magnesium ions which can occupy some of the available cation exchange sites preventing the accumulation of potassium and sodium within the media. Reduced potassium and sodium within the media also helps reduce plant shock especially when potting young plants.

Added Calcium and Magnesium for plant growth:

Calcium and magnesium are considered to be important nutrients required for plant growth. Calcium is an important component of plant cell walls as well as playing roles in ionic processes within the plant such as cell turgidity and root tip growth. Calcium moves very slowly within the plant. Magnesium is the central unit of chlorophyll – the photosynthesising pigment within plants – and is the most important element for the production of energy for the plant. This element is very mobile in plants. Magnesium deficiency is often noted in orchids (especially *Cymbidiums*) by the whitening of the leaf tips especially in the older leaves. Because calcium is not transported well round the plant, deficiency symptoms are seen first in the younger leaves, the plants therefore require a continuous supply of calcium for good growth.

The addition of dolomite to the media adds both calcium and magnesium required for extra growth. Growers often forget to add extra calcium and magnesium if it is not already present in the fertiliser that they are applying. To have these elements already present in Orchiata™ it means that growers run less risk of deficiency if they forget to apply a source. Many growers have now realised that the addition of calcium and magnesium has improved the health and quality of their plants.

3300.5 Natural Micro-organisms

As Besgrow™ Orchiata™ is an organic based media, it is able to host and grow a number of microbial organisms which are beneficial to plant growth. As well as growing many plant types, aged bark also contains natural flora and fauna which help to suppress pathogenic organisms

which can harm plants. Both composting and aging are processes where microbial growth is augmented to break down the organic matter within a pile. Most of the micro-organisms that are involved in this breakdown are saprophytes, this means that they only consume decaying organic matter, and they rarely cause plant disease. These types of organisms are encouraged to grow in bark as they help to protect plants from pathogenic organisms that can contaminate growing media.

During production, bark contains mostly beneficial organisms. These include high temperature genera and common saprophytes such as *Penicillium* and *Chaetomium*. These organisms are beneficial in the fact that they can out-compete pathogens in the right environment therefore creating “squatter’s rights”. Many of these organisms found in bark are only beneficial because of this competition; they colonise areas before pathogens do. Others show antagonistic properties towards certain pathogenic fungi. Genera such as *Mucor*, *Mortierella*, *Penicillium*., and *Trichoderma* show major antagonistic properties towards key root pathogens like *Rhizoctonia*, *Phytophthora* and *Pythium* through toxin production and fast colonisation. *Trichoderma harzianum* itself is specialised in plant protection. It is a major component of microbial fungicides as it actively grows towards plant roots and protects against most plant root pathogens. With these organisms commonly found in Pacific Wide Group bark based products, microbial occurrence is an important attribute for protecting plants against pathogen attack.

See section Biological Organisms Found in Orchiata™ for more information on Micro-organisms found in Besgrow™ Orchiata™.

3300.6 Environmentally friendly

New Zealand maintains a green image through its attempts to keep the country clean and renewable. Many products created within the country are made with this image in mind. Pacific Wide Group products are produced entirely with renewable resources. Since New Zealand has such a large expanse of man made forests which are farmed by sustainable means, we utilise the bark from these forests in an environmental fashion to produce products that consumers can feel good about.

Since *Pinus radiata* forests in New Zealand are grown under scrutiny by the Government and Resource Management Acts, all native trees and lands are preserved. During milling, bark becomes a waste material that has in the past been stockpiled creating complications for environmental reserves. By utilising this material efficiently we are assisting the environment through preventing the dumping of wood waste and encouraging the continued use of sustainable land use.