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The Nitty Gritty on Sand and Container Media

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Despite advancements in soilless media research and technology, growers still add sand to their soilless media blends. This practice has probably been around for as long as plants have been grown in containers. Because sand is readily available and inexpensive compared to other media additives, it seems to make an appealing media amendment. However, sand is chemically inert, offering no additional nutrients, CEC, or pH altering abilities, and, still worse, it adds weight, changes drainage and water holding capacity, increases bulk density, and wears machinery and equipment down more quickly than the alternatives.

Sand Adds Weight to Containers

Sand is very heavy per volume, meaning it has a high bulk density. One cubic yard of sand can weigh 2,700 pounds. Increasing the weight of your containers by adding sand still won't prevent them from blowing over. The surface area of foliage combined with the height of the plant acts as a sail, and the plant will tip over in a wind regardless of how heavy the container. A better way to prevent the containers from blowing over would be to anchor them in some way such as driving a metal stake through the bottom of the container.

Adding sand to a container media will:
- Add weight
- Slow water drainage
- Increase water holding capacity
- Increase bulk density
- Wear down machinery parts

Sand Increases the Amount of Insecticide Needed

Nursery growers in Middle Tennessee and other parts of the country are forced to comply with pest quarantines and restrictions. For Imported Fire Ants, many chemical drenches and media incorporation rates are based on the media's bulk density. Since sand has an incredibly high bulk density, adding even 10% sand to the media blend will significantly increase its bulk density. The resulting higher bulk density will require more chemical to be applied, raising chemical purchasing costs.

Adding sand to a container media will not:
- Prevent containers from blowing over
- Improve drainage
- Grow a better plant

Sand Increases Transportation Costs

A heavier container means fewer containers per shipment. Adding 10% sand will increase the weight of the container by 25-30%, not just 10%. This phenomenon is explained by the following scenario. Adding 10% dry sand to a dry blocky bark media will increase the containers weight by approximately 10%. However, no container grower leaves their containers dry. After the container is watered, the sand acts similar to a sponge, holding onto more water than the media would by itself. Thus, after watering a container with a bark-sand media, the total weight of the container is increased due to the weight of the sand and the increased irrigation water.

Sand Slows Water Drainage

Talking about how sand effects water drainage can be confusing. The common acceptance among growers and gardeners is that adding sand improves drainage. However, sand effects drainage differently depending on the parent material it is being added to, and how much is added. In a blocky bark based media (Image 1), the sand grains will settle into the large macro pores (Image 2). Where water would normally drain freely, it is now forced to slow and divert.

Adding sand to a fine grained parent material like clay will also fail to improve drainage. When sand is added to a clay soil, the clay particles fill in around the sand grains the same way the sand grains settle into the large macro pores of a blocky bark media. While drainage remains unchanged, the soil's bulk density increases. It is possible to improve drainage in a clay soil by adding sand but the amount required is impractical on any large scale. In a nursery propagation bed, sand routinely makes up 75% or more of the soil. This is done on a relatively small scale with the justification of a high economic return.

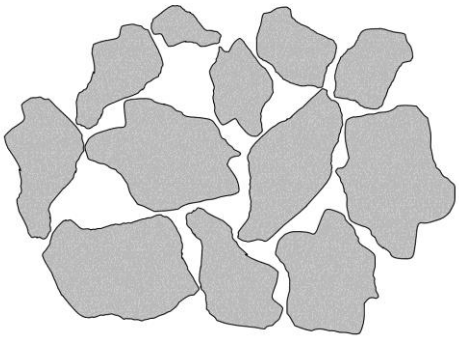

Image 1. A representative illustration of the individual bark chunks in a blocky bark media. They are arranged randomly which allow for large macro pores.

Sand Grinds Down Machinery Parts Quickly

The type of sand added to media is generally masonry sand or coarse sand. Coarse sand is mined in quarries and has rough edges unlike river and ocean sand which will have round polished edges. Ocean sand will also contain salt residue which will kill most plants. Coarse to medium grade sand is what is often used, sized at 0.25 – 2 mm, and unlike organic materials, is very abrasive. Sand will cause media blending machines and parts to wear out much faster. Some growers report replacing parts and even whole machines annually from the constant grinding of the sand.

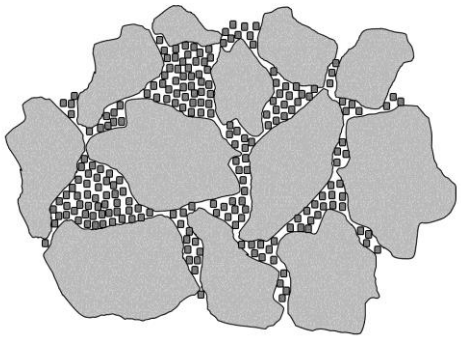

Image 2. When sand is added to a blocky bark based media, drainage slows and bulk density increases due to sand settling into the macro pores.

Adding Sand to Media Will Not Fill More Containers

You might think that adding 9 scoops of bark media and 1 scoop of sand will give you 10 scoops of a sand and media blend. However, when sand is added to a large block bark media, the sand will settle into the large macro pores (Image 2). Adding 9 scoops of bark media and 1 scoop of sand together will yield just 9 scoops of a heavy bark and sand media blend. No more containers should be filled by adding sand to your media.

Bark Media Blends Can Have the Same Effects as Adding Sand

Remarkable improvements in bark and wood media have been made in recent years that allow them to be formulated to provide the effects of sand without the increased weight, bulk density, or worn machinery. Instead of adding sand, consider using a new media blend of varying particle sizes and shapes to give you the results you desire. Chemical amendments like lime and fertilizer should still be incorporated as necessary. Remember to pay close attention to the irrigation and moisture level when trialing any new media. In the past sand may have had a place in media blends, but with new research and products available today, it is not worth the added weight, bulk density or worn machinery.