



# Growing Media Handling Guide

Properly handling growing media can reduce shrink, produce healthier crops and improve profits.

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**G**rowing media can be a large component of a grower's production costs. Improper mix handling and poor cultural practices can result in decreased plant quality and, ultimately, an increase in shrink. There is no room for shrink in today's changing economy. The growing medium must have the right combination of physical and chemical properties, and it must be properly handled. The information presented is primarily directed toward small- and medium-sized growers who purchase prepackaged professional growing mixes, but the principles apply to all growers, including those with their own mixing facilities.

Proper media handling can be summed up with one objective: Avoid compaction of the growing mix. The two most important physical properties of a mix are air space and container capacity. Together, these equal total porosity. Ideal air space for greenhouse propagation mixes ideally should be in the 10- to 15- percent range, while greenhouse production mixes typically are within the 15- to 25- percent range. Perennial and nursery crops often have air space values greater than 25 percent. Container capacity values vary but usually fall within the 65- to 80- percent range; therefore, total porosity values are normally in the 75- to 95- percent range.

Some growing media manufacturers may produce soils several months before they are used, so focused attention to the physical structure and chemical composition of potting soils is paramount. Commercial mixes contain standard materials like peat, perlite, vermiculite and aged/composted pine bark that provide porosity, yet hold moisture (usually a set range of moisture between 45 and 55 percent), so the method in which they are blended and packaged can impact physical properties like bulk density (weight per volume). Inquire with your mix supplier as to how quality-control standards are maintained prior to your receipt of the mix.

## On-Site Inspection

Upon receiving commercial mixes, inspect the quality of the packages to ensure that excessive moisture has not penetrated into the mix. Most pallets will be covered with shrink wrap and draped with black plastic to avoid rainfall from entering the mix. Overly saturated mixes can

bog down the pot-filling equipment and introduce weight that poses a safety hazard to greenhouse workers lifting bags. Tiny perforations on the bag surface allow excess air to be squeezed out during palletization and create a tighter and safer pallet during movements.

An on-site inspection of the mix is sometimes appropriate, especially for new customers, to observe the physical makeup of the growing mix. Ask these questions: Is it the mix you ordered? Are you pleased with the quality of the components? Are there any signs of fungal growth or mold on the mix? Sometimes odd smells can come from commercial mixes because of excessive moisture combined with natural biological activity.

## Proper Storage

Once the mix has been removed from the delivery truck, ensure the mix has been properly stored. Sometimes algae builds up within the layers of shrink wrap and can give a false impression of the mix's quality. Most pallets are capped with black plastic and shrink wrapped, so the less light that can be provided to the packages, the better.

Some growers who do not have facilities for mix storage will cover the entire soil load with opaque tarps. If growers store mix longer than six to eight months in full sun, weathering of the wrapping material and a reduction in wetting-agent efficacy may occur. Long-term storage under extreme conditions can make a mix difficult to wet. If such conditions exist, test the mix for wettability before potting. Avoid placing heavy items on top of the pallets that would compress and compact the mix.

Storing the mix in a dry, low-light environment is always best. If the environment can be controlled, try to keep the temperature between 40 and 70° F, especially when using biologicals and controlled-release fertilizers that are sensitive to temperature extremes. Mixes should not be stored in greenhouses during production for fear of accidental wetting, adult fungus gnat movement into bags and reduced wetting agent efficacy from extreme heat. ▀



*Top: When dibbling, try to avoid compressing the mix. Above: When filling by hand, place an excess amount in the container, compress or tap gently, and sweep to rim level. Below: Equipment adjustments should be made prior to running flats through the system.*



## grower 101

### Chemical Properties

For chemical properties, check freshly shipped mix by using the pour-through method to ensure appropriate pH and EC levels. Obtain a mix sample from the interior of the bag and fill three 6-inch

pots. Moisten the mix three times with tap water over the course of two to three days; then pour 3 fluid ounces of water over the top surface until sufficient leachate is collected (use small plastic cups or plant saucers) from the bottom of

the pot. Test the leachate with a pH and EC meter. This timeline allows for the limestone, soluble fertilizer and other fertilizer additives like gypsum to be activated or dissolved. Some companies may even have a retained sample to review

in case there are questions about the integrity of the mix.

### Sanitation

Prior to pot filling, ensure that all tools are clean, including box cutters, bale slicers, shovels and brooms. Dirty tools and containers may pose the risk of introducing soil-borne pathogens to a clean mix. If using a mixer, minimize the blending time to avoid a grinding effect that results in changes to physical properties (normally witnessed as a drop in air space and an increase in container capacity). A 2- to 10- percent reduction in air space has been observed before and after the mix is blended. Some growers have installed timers on augers and hoppers to control the amount of blending, while others count how long the mix is blended. For growers with pot fillers, try to avoid recycling, or reduce the fines that fall off of the mix line as this can reduce the air space and create "tighter" mixes.



### Check Equipment

Equipment adjustments should be made prior to running flats and pots through the system. Gates on hoppers should deliver the right amount of mix to containers. Rollers and brushes should be set to minimize compaction and reduce excess mix to be recycled. Mix shrinkage in the container can be caused by a few factors: first, by the mix being too dry and flowing out of the bottom of the container through the drainage holes; second, by an excess of air in the mix because of "bridging" of particles during the filling process or not filling fully to the top of the container; or third, brushes set too low that remove mix below the rim of the container.

An easy way to achieve consistent filling is to maintain a uniform

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Above: Example of poor flat filling. Left: Example of poor basket filling.

moisture content of the mix, prior to filling. A general rule of thumb is to squeeze the mix; if the slightest bit of visible water appears between your fingers, you have achieved a satisfactory filling moisture level. Most growers work with a moisture level between 45 and 55 percent by weight. When filling flats and pots by hand, make sure that there is an excess amount placed in the container, compress or tap gently (two times) and sweep to the level of the pot rim. It is OK to have the mix filled to the top because some settling will occur when pots are watered in. Some compaction is desirable since it reduces large pore spaces and encourages more uniform wetting of the mix.

Once filled, avoid nesting or stacking trays and pots on top of one another, as a significant drop in air space can occur. Try to stagger trays or place sheets on weatherproof corrugated fiberboard between the trays or pots. The use of trays for inserts has minimized the effect of nesting, but too much weight in a stack of trays can impact the growing media's physical properties. When dibbling seed trays, try to avoid compressing the mix; gently press to ensure a small indentation for seeds.

Irrigation methods have an enormous impact on the mixes physical properties. Hand watering typically compresses soil in pots or washes the soil out of the pots; therefore use breakers on the ends of watering wands and hoses to reduce water pressure. It is best to use drip or subirrigation to minimize compaction after the initial wetting. Media compaction can also occur during potting. Apply minimal pressure around the rootball to snug the plant in place and create good contact between roots and new mix. Compacting downward with heavy pressure will reduce air space significantly. [GPN]

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