

Media mixing, handling and storage

The ideal formula for a container medium may be known, but proper mixing and handling procedures must be followed if optimum results are to be obtained. Assuming components arrive at the nursery free of weeds, weed seed, pathogenic fungi and insects and with a uniform and acceptable particle size distribution, the nursery operator must take steps to ensure the quality is maintained.

Component storage

Components must be stored off the ground and protected from surface water. A concrete slab or bin is ideal for components received in bulk. The surface water patterns around the concrete slab must be adjusted to eliminate the possibility that surface water, carrying pathogens, weed seeds and/or insects, that could come into contact with the medium component. Bulk components should be covered with black plastic film or other suitable covering to prevent contamination with wind-borne seeds, pathogens and other pests when access is not necessary.

The length of the storage period determines whether bagged components are stored outdoors or at least under cover. Most bags will remain intact outdoors for 6 to 8 weeks, but if an annual supply is purchased, indoor storage is needed. Covering bags stored outdoors with opaque plastic film will extend the life of the bags. Even if outdoor storage is acceptable, consider the surface water drainage pattern and the ground surface because most bags are not watertight.

Mixing procedures

When various components are mixed together, a homogenous mixture must be obtained. This includes fertilizer amendments as

well as growth medium components. Variability in a growth medium batch or between batches can result in differences in plant growth and quality, because the water-holding and aeration characteristics and fertilizer concentrations would differ from container to container. Obtaining uniform mixtures without altering the particle size distribution of the medium is not easy, but its importance can not be overemphasized.

Consideration must be given to the reasons a nursery operator would choose to mix media on the site rather than purchasing media prepared to certain specifications. Media must be available upon demand. Advanced planning is usually more critical if pre-blended media are purchased, but there must be sufficient advanced planning even if components are purchased individually. Cost is another consideration. It might be more economical for a small to medium size nursery to purchase media ready for use because of the high cost of effective mixing equipment. However, larger nurseries generally mix adequate volumes of media to justify the purchase and maintenance of appropriate equipment.

A good system for mixing medium components in a nursery utilizes a rotary-type mixer, such as a cement mixer commonly used on ready-mix trucks, or a drum and paddle type mixer. There appears to be less breakage of the component particles when rotary-type mixers are used, but difficulties include loading the mixer and retrieving the mixture. Adjust rotating drum speed so materials are carried well up the drum wall before tumbling. Drum and paddle-type mixers can be used effectively if the mixing duration is carefully monitored. Stationary horizontal drum mixers should not be filled above two-thirds the auger diameter or the top-added components can float and

not mix into the lower materials. With prolonged mixing, the particle size of some components can be reduced significantly resulting in a medium with unknown and possibly undesirable water-holding and aeration characteristics.

The proper mixing system can also vary with the medium components. Perlite can be easily crushed during mixing, reducing the particle size. Vermiculite is an expanded material and if crushed, it will not expand again. When the particle size of such materials is reduced, they do not serve the purpose for which they were chosen. Resin-coated fertilizers and other pelletized fertilizers may be crushed by prolonged mixing in some mixing equipment.

Systems are now available that allow the components be placed in large bins from which they drop onto conveyer belts in layers or directly into the mixer at the proper ratio. Fertilizers and other chemical amendments can also be applied in this manner. Other systems require loading the components into the mixer with a front-end loader at the proper ratio.

Some nursery operators utilize front-end loaders to mix media by turning the various components piled on a concrete slab. This system is inexpensive but simply does not provide uniform mixing, especially of fertilizer amendments. It is impossible to uniformly distribute 1 to 3 pounds (0.45 to 1.4 kg) amendment of all per cubic yard of medium by sprinkling it on the surface of a pile of growth medium components to be turned by a front-end loader. The problem with adequate distribution of amendments during mixing with a front-end loader can be solved by purchasing one of the components, for example pine bark, with the amendments already uniformly distributed in the component at a