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Idaho Soil Mix

For Container-Grown Plants

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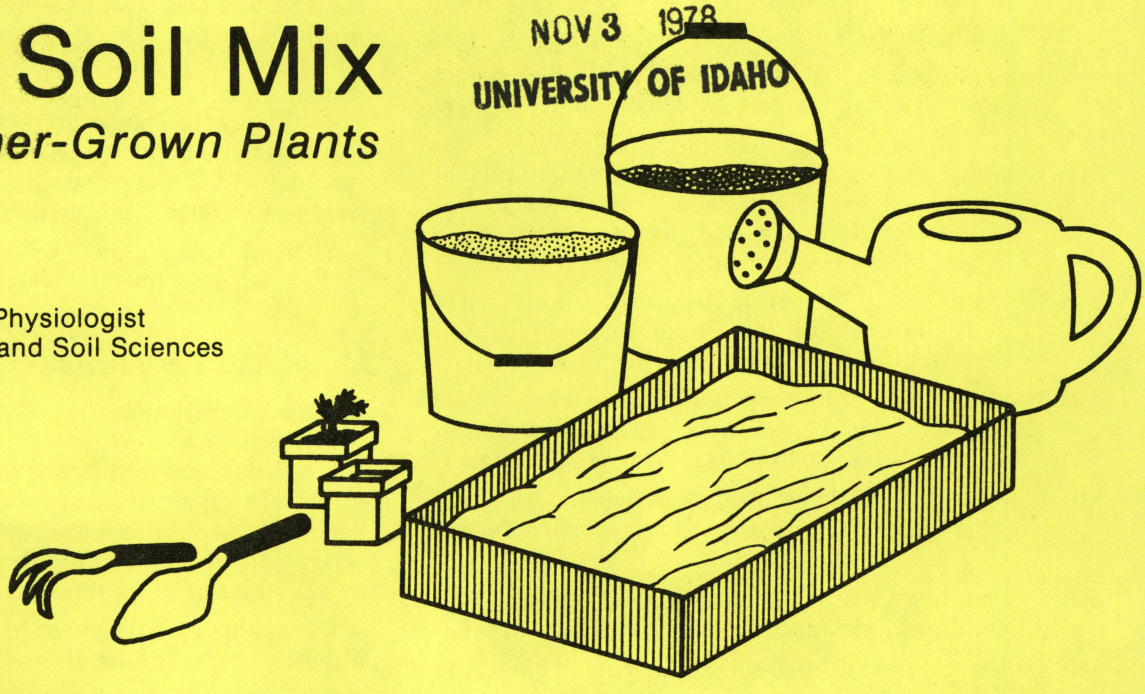

Synthetic soil mixes have essentially replaced field soil for growing containerized plants in the greenhouse and nursery industries. The reason is that synthetic mixes can be controlled in fertility and water-holding capacity, giving a more uniform crop. Synthetic mixes also can be made of light materials which makes the plants easier to handle and less costly to ship.

At the University of Idaho, we have been using a synthetic soil mixture in the greenhouse and nursery to grow plants for research. This mixture has proven very satisfactory for most crops and is being used widely by other researchers and growers.

Ingredients for Soil Mixes

Sand — Washed mortar sand of good quality, free from clay and of uniform particle size. Mortar sand is available from most premix plants.

Peat — Good quality Canadian or domestic peat, finely ground and free from coarse plant material.

Perlite — A medium grade of horticultural perlite. This is becoming quite costly but adds to the drainage and texture of the mix.

Vermiculite — A good horticultural grade, medium to fine particle size.

Bark — Finely ground fir bark can be used to replace some of the more costly peat and perlite in mixes for container-grown plants, particularly nursery stock.

Controlled-release fertilizer — These supply nutrients to the plants over an extended period. They can be used as the only source of nitrogen, phosphorus and potassium but we recommend that they be combined with a liquid feeding program. These fertilizers are available from supply houses catering to the container plant industry or in small packages from garden stores. Choose one with N-P-K formula of 14-14-14 or 20-20-20 that will release over a 90-day period.

Soluble fertilizers — Many water-soluble fertilizers are available that can be added during irrigation either by metering into the water or by applying with a watering can. We recommend that they contain minor nutrients.

Minor nutrients (trace elements) — We use a fritted glass trace element mixture available from supply houses and garden stores. Usually the irrigation water will contain most of the minor elements, but adding a trace element mixture is insurance against deficiencies.

Lime — Dolomitic lime, a mixture of calcium carbonate and magnesium carbonate, is essential as a buffering system in the soil mix and as a source of calcium and magnesium for the plants.

Mixes

Measure the bulky components of the mix on a volume basis. For small batches, measure with gallon cans or 12-quart buckets. For larger quantities, you can use wheelbarrows or loader scoops. Regardless of the size, extreme accuracy is not required except in strictly controlled situations such as in research.

Fertilizers, however, must be measured accurately by weight or volume to prevent toxicities and to save costs, because these materials are costly.

The mixes suggested below will yield a 30-gallon batch. Larger or smaller batches can be calculated from these quantities:

Mix 1— Basic peat-sand-perlite mix: use 10 gallons each of peat, sand and perlite; add 1 pound controlled release fertilizer, 1 pound lime and ½ teaspoon fritted glass trace elements.

Mix 2 — Peat-vermiculite-perlite mix: use 10 gallons each of peat, horticultural vermiculite and perlite. Add fertilizer, lime and trace elements as per mix 1.

Mix 3 — Peat-sand-perlite bark: use 10 gallons each of sand and bark and 5 gallons each of perlite and peat. Add fertilizer, lime and trace elements as per mix 1.

Mix 4 — Peat-sand-bark: use 10 gallons each peat, sand and bark. Add fertilizer, lime and trace elements as per mix 1.

Mix 5 — Sand-bark: use 15 gallons each sand and bark. Add fertilizer, lime and trace nutrients as per mix 1.

Mix 6 — Bark: use 30 gallons of finely ground fir bark. Add fertilizer, lime and trace elements as per mix 1.

Other mixes — The bulky constituents of the mix can be manipulated to meet the needs of the grower. A peat-sand mix might be desirable for certain crops or for germinating seed. A bark-peat mix makes a very light mix for shipping plants. The ingredients can also be manipulated to take advantage of prices and supplies. Be careful, however, to adjust cultural practices, such as watering and feeding, to fit the characteristic of the medium.

Mixing

These ingredients must be thoroughly mixed. We prefer to spread the ingredients in layers on a clean cement floor, mixing in some of the fertilizer as the peat, sand, etc. are added to the pile. Water should also be added. Scalding hot water or a wetting agent helps to wet the peat and bark.

Once all of the ingredients are in the pile, shovel them together once or twice and then run them through a mixer or soil shredder two times or more. This procedure works well for small batches. If a soil mixer or shredder is not available, continued mixing by hand will suffice. Soil mixers are usually used for large operations. We have observed one operation where a power take-off manure spreader was used successfully. The materials were loaded into the manure spreader with a scoop and spread out in layers. When these were run through the beaters, a fine mixture resulted.

Successful plant growth will depend on a thorough job of mixing, whatever method is used.

Modifying Fertilizers

If a combination controlled-release and soluble fertilizer program is to be used, we recommend that the amount of controlled release fertilizer be cut in half and that the liquid fertilizer program start at once. On nursery stock, a top dressing of controlled release fertilizer may be added after 3 or 4 months. The soluble fertilizer should be injected into the irrigation water at recommended rates.

If tomatoes are to be grown in the mix, double the amount of lime to prevent blossom-end rot.

With mixtures containing large quantities of bark, use a soluble fertilizer that contains sulfur because this element is tied up by the bark.

The ideal mix should produce a rapid-growing plant free from nutrient deficiencies. The mix should be easy to irrigate and should hold water from one irrigation period to the next. The mix should be easy to prepare, free from disease and as inexpensive as possible. The University of Idaho soil mix system meets these criteria and also allows the mix to be adjusted to meet other needs of the grower.

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