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Media, water impact propa

Mix your own Page 53

Success in propagation from seed and vegetative cuttings can be greatly affected by the type of propagation media used and by water quality. The media used will impact root development and aeration for new seedlings or rooted cuttings. Water quality can impact misting efficiency and will impact media pH. The impact on media pH can affect further growth of the seedlings or cuttings.

Making a decision to purchase a commercial medium or to mix a medium on site requires understanding the characteristics of various media components and their impact on media physical properties. A successful grower will choose a medium that fits the type of propagation, along with the conditions under which the propagation occurs (temperature, light levels, watering practices, etc.).

General properties of bark, coir, and peat moss

Bark

- Essentially sterile. May impart disease resistance.
- Source: United States and Canada.
- Requires nitrogen addition and pH modification.
- Best used for production.
- Grades and coarseness vary depending on processing.
- Most common problems are related to improper composting.
- Major concern: Improper composting, which can lead to nitrogen tie-up and poor plant growth.

Coir

- Essentially sterile.
- Source: Sri Lanka, India, and Mexico.
- May require nitrogen addition.
- Excellent component for propagation and production.
- Most available coir is similar. There may be some slight variations.
- Most common problems are high soluble salts and lack of understanding of properties.
- Major concern: Sourcing, age of product used, high water-holding capacity.

Peat moss

- Essentially sterile. May impart some disease resistance.
- Source: Canada.
- Requires pH modification.
- Excellent component for propagation production.
- Grades and coarseness vary depending on processing.
- Most common problems are related to age or fineness.
- Major concern: Environmental effects of harvesting. Should not be an issue.

General properties of perlite and vermiculite

Perlite

- No soluble salts.
- Neutral pH.
- Sterile.
- High pore space.
- High air space.
- Little to no water-holding capacity.
- Little to no cation-exchange capacity.
- Low bulk density

Vermiculite

- Generally, low soluble salts.
- Moderate to high pH.
- Sterile.
- High pore space.
- High air space.
- Moderate to high water-holding capacity.
- Moderate cation-exchange capacity.
- Low bulk density

Mix properties vary

The properties of a propagation mix usually differ from one that is used for growing on. A propagation mix is exposed to high humidity. It also usually fills small containers or cells, as compared to larger containers for growing on. Because of these factors, a propagation mix needs to be fine in texture, but still allow for good aeration.

During propagation, little to no fertilization

Planning for propagation includes selecting the proper growing mix and having a knowledge of water quality.

quality gation

By Dan Jacques

Since a propagation growing mix is exposed to high humidity, it should allow for good aeration due to the high levels of moisture.

occurs until seeas nave germinatea or cuttings have rooted. The main chemical reaction in a propagation medium is the effect of the lime that is incorporated into the mix. The lime causes an increase in the medium pH. Propagation mixes usually have lower levels of lime and nutrients.

Propagation mixes used for seed germination need to be very fine in texture, as the germination usually occurs in small cells. These mixes generally contain fine peat moss and some aggregates such as perlite or vermiculite.

Sometimes the peat is replaced

General properties of bark ash, composted peanut hulls and rice hulls

Bark ash	· High pH. · High bulk density.	· Generally high in moisture. · Low nitrogen draw.
Composted peanut hulls	· Moderate pH. · Moderate bulk density.	· Similar properties to composted bark. · Low nitrogen draw.
Rice hulls	· Available composted and from parboiled processing. Moderate pH.	· Low bulk density. · Low cation-exchange capacity. · Low nitrogen draw.

with coir. An additional aggregate is still needed.

Many growers prefer fine perlite for plug production. Fine perlite has no impact on the chemical properties of a mix and provides good aeration. Fine vermiculite can also be used, but it tends to have a higher pH and water-holding capacity.

Coir added as a replacement for peat increases water-holding capacity, but keeps aeration about the same. Coir also tends to increase the medium pH, but not as much as vermiculite. It has generally been found that only a portion of the peat can be replaced by coir. Coir tends to be more granular and the root ball could fall apart when plugs are removed from the trays for transplanting.

Cutting propagation

Vegetative cutting propagation mixes can be coarser than those used for seed germination because cutting propagation is usually done in small containers or larger cells. However, many growers tend to use the same mix for both vegetative and seed propagation. Good water-holding capacity and adequate aeration are key.

In the case of cuttings, mixes containing bark are sometimes used, especially if the containers will be used to grow the plants on for some time after roots have formed. Regardless, the same chemical properties that are important for seed germination are also important for rooting of cuttings.

Commercial mixes

Most propagation mixes offered by manufacturers tend to be peat/perlite or peat/vermiculite mixes. Some will contain coir. When selecting a propagation mix, growers should focus on quality and consistency.

The potential value of the plugs or cuttings is high in relation to the amount of mix used. Growers can request specs on the mixes and can usually find a mix to fit their specific needs.

Remember that the mix's chemical properties are affected by water quality. That is why most plug and propagation mixes tend to be low in nutrients and lower in lime than standard growing on mixes. Avoid mixes with high soluble salts or pH.

Propagation mixes should also be tested for wet-out. A good wetting, agent is essential for even and thorough distribution of water and nutrients. Some growers will add a wetting agent when they initially water in the seed or cuttings.

Make Your Own

Growers making their own mixes should buy components from reliable suppliers. Peat moss and coir should be low in soluble salts.

Other components such as perlite and vermiculite are often overlooked before adding. This can be a problem, especially with vermiculite. Some vermiculite can have higher soluble salts and a higher pH. Growers should know vermiculite's properties before incorporating it into a mix. Test for soluble salts, pH and total nutrients. Most vermiculite tends to be low in sodium and high in potassium. Also test other mix components.

Once the main components have been selected, consider the chemical components such as lime, fertilizer and wetting agent. The nutrient charge should be relatively low so fertility can be controlled.

Most mix companies use a lower nutrient charge in their propagation media than in their standard growing on media. Growers may want to consider not adding a starter charge to their own propagation mix.

A wetting agent is a must, as proper water penetration and dispersion in the mix will help attain a more uniform crop. Follow label rates for wetting agents.

Most companies use a fine-grade dolomitic lime for mixes. This lime tends to buffer pH well and provides calcium and magnesium for plant use. Many factors affect pH other than the lime. The most important of these is water quality, especially alkalinity. This can have a greater impact (especially high alkalinity) than the lime addition. Many propagation mixes have a lower lime charge than standard growing on mixes.

Water-quality impact

In the early stages of propagation, pH will generally begin to increase since the main reaction is that of solubilization of lime. A fertilizer charge has little impact since there is little to no nutrient uptake at this point. This is why, in most cases, the lime rate for growing mixes used in propagation tends to be lower than that in production mixes. Water high in alkalinity causes numerous pH problems during propagation unless it is treated before use.

Much research has been done on the effects of water quality on pH and on fertilizer needs for growing a crop. These same principles hold

GROWING MEDIA

Propagation mixes for cuttings can be coarser and may contain bark.

true (and are magnified) during both seed and vegetative propagation.

Seedlings and recently rooted cuttings are usually not provided a high rate of fertilizer. Therefore, the impact of fertilizer selection on pH is not that great. Fertilizer recommendations based on water quality do not hold as well in propagation, since growers generally use high-nitrate fertilizers at low rates.

Nitrate nitrogen causes a rise in the medium pH over time. As with the lime reaction, this can he magnified if water high in alkalinity is left untreated.

It is usually recommended that water for propagation be treated to bring alkalinity down to 40-60 (or lower) parts per million calcium carbonate. This range is low enough to slow the impact of lime and nitrate fertilizers on medium pH. Keeping the water at or below this range also tends to keep the irrigation mist heads clean. Test water once or twice per year to make sure alkalinity is staving in the proper range.

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