GROWERTALKS

Features

1/1/2024

Synergizing Growing Media

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Q. As we're facing a peat shortage, which alternative is similar to peat?

A. Of all non-peat materials, coir—coir pith to be more specific—is like a close sister to peat, not a distant cousin like bark or wood fiber. Coir not only looks like peat and feels like peat, but is similar in its microscopic structure, too. During past peat shortages, growers successfully substituted 30% to 40% of peat with coir without modifying cultural practices. Growers on their greenhouse benches or customers on store shelves couldn't spot plants in the coir+peat mix next to plants in their regular peat-lite mix. In fact, most growers continued to use the coir+peat mix because the combination worked better than their mix before. As container shipping costs from Asia are down, so are coir prices, which are comparable or even lower than peat prices.

Pictutred: Though coir and peat look and feel similar, combining them makes the mix work even better than each working on its own. Photo courtesy of Brandon Yep.

Q. How are coir and peat similar in their structure? Doesn't structure affect a material's capacity to provide water and air to roots?

A. When you magnify under a microscope, you see both coir and peat particles have honeycomb-like structures. Both have about half of their volume as hollow tubes or voids—where they hold water—so their capacity to hold water is similar. However, coir tube mouths are bigger and more of them than peat tube mouths, so water enters and exits coir faster and easier. As air replaces exiting water spaces, coir becomes airier earlier—providing oxygen to roots—while peat holds and provides water longer. So the coir+peat combination strikes a better balance of air and water to roots.

Q. Doesn't coir wet easily while peat requires a wetting agent?

A. Yes. In the coir+peat mix, coir acts like a natural built-in wetting agent and the mix wets quickly. You can steer your growing to the dry side, re-wet over-dried plants at stores quickly or use a dry mix left over from the previous year. Since the coir+peat mix absorbs water fast, the mix reaches its full water-holding capacity in minutes, so you don't waste your water and time.

Q. Does this swift water absorption translate to better availability of water to plants in the coir+peat mix?

A. Coir and peat compensate each other's unwanted properties. More granular coir and more fibrous peat hold together and connect well. Water in the coir+peat mix moves well from top to bottom, bottom to top and sideways, thus replenishing the water depleted by the roots wherever they're in the mix. When you open the mix rootball, you see homogenously wet mix—not dry and wet pockets. Unlike coir alone that dries more on the surface, the coir+peat mix dries evenly, as peat supports capillary rise of water to the surface. The bulk density of the coir+peat mix is similar or even lower than the bulk density of coir or peat alone, indicating coir or peat particles aren't sitting in between each other, and not clogging pore spaces and oxygen movement to roots.

Q. While peat is known for low EC, isn't coir salty?

A. Yes, raw coir has an EC of even 6—mostly due to high sodium, potassium and chloride. But most of these salts are washed out naturally by monsoon rains or during coir processing, so most coirs these days have an EC of about 1, which is acceptable for most growing situations. You can also wash salts out of coir before planting. This washing removes excess tannins and phenols in coir, which are a concern for bareroot transplants and cuttings, and for UV disinfection of water (due to darkening). In the coir+peat mix, high salt levels in coir are further diluted by low salt levels of peat.

Q. What is buffered coir and isn't it more expensive to buy?

A. Washing with plain water takes out salts outside coir particles. Still, some sodium and potassium ions are chemically attached to coir particles, which during growing can lock out calcium and cause leaf burn in young or sensitive plants. To detach those ions, cations like calcium and magnesium take the place of unwanted sodium and potassium. To contain the cost of buffered coir, you can buffer at your site before planting or even during the beginning of growing. Soak coir with a cal-mag fertilizer, let it sit for a few hours during which ions exchange places and then rinse with plain water until you see no displaced sodium coming out in drain water. In the coir+peat mix, calcium and magnesium coming from dolomite, gypsum and starter fertilizer also do the buffering.

Q. What about pH changes in peat and coir?

A. Peat has a large (>3 times larger than coir) pH buffer capacity due to high levels of humic and fulvic acids. When H+ ions are released into soil water—say by a plant when it takes up potassium—peat acids adsorb H+ so soil water pH doesn't drop. Similarly, when a plant releases OH, peat acids release H+, so soil water pH doesn't rise too much. Because of the smaller pH buffer capacity, coir's ability to adsorb and release ions is low, so coir alone shows more pH swings. In the coir+peat mix, pH yins-yangs are regulated better.

Q. Can coir+peat mix be used in organic growing, too?

A. Indeed, the coir+peat mix is more optimal for organic starter fertilizers. After you add organic fertilizer—if you follow lab analyses of mix—you notice bacterial conversion of organic nitrogenà ammoniumà nitriteà nitrate before uptake by plants. Peat has bacteria that converts to ammonium, but doesn't have oxygen-requiring bacteria that converts the next steps of ammonium to nitrate because peat comes from bogs where there's no oxygen. It takes three to four weeks for bacteria that convert ammonium to nitrate to build up in peat.

Remember this conversion doesn't occur if you keep your mix too wet—like peat bogs. Coir has both types of bacteria almost from the start. However, since conversion to ammonium increases pH and coir's pH buffer capacity is small, coir pH rises. If pH rises too high (>7), ammonia gas penetrates roots and arrests seedling root elongation. Ammonia also attracts fungus gnats. Due to the attributes of each, the coir+peat mix supports both types of bacteria, driving full conversion of organic nitrogen to the safer nitrate form without lag, as well as provides higher buffer capacity, reducing pH rise, harmful ammonia and fungus gnats.

Q. Isn't coir more stable and that's why more coir is used for crops that sit in the mix for a long time, like

blueberries?

A. Yes, with >40% lignin, coir is more stable and resists physical breakdown by pushing roots and biological breakdown by bacteria, thereby maintaining a good structure for three to four years. Due to this slower breakdown of particles, the coir+peat mix slumps or compacts less, thereby maintaining pore spaces, facilitating air penetration into the mix and oxygen to roots. However, decomposition pace depends on the coir source. Avoid fresh coir or coir from green husks. Coir aged for about six months—during which its ratio of lignin to cellulose increases—is more stable.

Q. Since the coir+peat mix is more stable and degrades less, can the mix be reused to tackle the peat shortage even more?

A. When you're selling a product not with the mix, like cannabis, reusing the coir+peat mix is a viable option. Used mix is easier to loosen and aerate if you're growing in beds or troughs. Remnants of roots in the used mix degrade in a few days. Subsequent crops grown in the used mix seem to give comparable yields. You would know fertilization, root disease pressure and weeds in the mix during its previous use. You may have to restore pH and adjust initial fertilizer application to residual nutrients in the used mix. You can also blend the used mix with the new mix to dilute any risk. Run your own trials.

Q. What about using the coir+peat to grow plugs?

A. Peat has natural cohesive substances, so peat holds together when you pull a peat plug out of the tray cell. This stability makes it easy to transport and transplant plugs. Granular coir is loose and falls apart when you pull a coir plug. The coir+peat plug mix works alright, especially if you're wrapping the mix in paper or net. Use extra-sieved, finer-grade coir to avoid coir clumps and fur hairs that pose problems when filling plug trays. Also, some seedlings are sensitive to salt levels in coir.

Q. What's a good way to go about using the coir+peat mix given some nuances of coir quality?

A. If you're not experienced in using coir, talk to your peat supplier, as the properties of coir depend on the source and size of coir. Most peat companies have coir factories in India or Sri Lanka and they apply peat quality rules to coir. They can put together a coir+peat mix. When you buy the coir+peat mix, you don't have to deal with slow coir boats from Asia, decompressing coir bricks to get the yield you paid for, coir clumps or fur balls during mixing, tricky coir buffering, etc. Instead, you can have a ready-to-use clean, consistent coir+peat mix when you want. **GT**

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