



## **The Mystery of Sphagnum Moss**

by Sue Bottom, sbottom15@hotmail.com

Orchid growers have a love hate relationship with sphagnum moss. Those that hate it say it caused their plants to rot, and those that love it have probably learned how to properly water plants growing in it. They've learned that you don't water because it's Saturday morning, your normal watering day. You water plants growing in sphagnum when the moss approaches dryness. Grower, know thyself. If you have a heavy hand with watering, sphagnum moss may be problematic for you as you will have to struggle not to water your plants until the moss is nearly dry. If your busy schedule keeps you from watering very often, you may have the opposite problem where the moss can become so dry it becomes crusty and is hard to rehydrate.

Knowing how sphagnum moss grows in nature gives the orchid grower valuable insights. A living layer of moss grows in carpet-like communities in very wet areas floating on a thick layer of partly rotted plant material. The carpet consists of vertically oriented leafy stems that grow upward while the lower stems become buried, die and ultimately decompose to form beds of peat moss. Sphagnum moss tends to acidify its surroundings having a pH as low as 3, which not many bacteria or fungi can tolerate so decomposition occurs slowly. The sphagnum stems are filled with air spaces and have an impressive water holding potential. The moss grows in a low nutrient environment to which it has adapted by having a high cation exchange capacity largely as a result of its high uronic acid content.



Which would you rather pot your orchids in, the long fibered New Zealand sphagnum on the left or the commercially available sphagnum on the right?

There are many qualities of sphagnum moss that make it a good growing medium for epiphytic orchids. The air filled porosity of sphagnum moss (a measure of the void spaces in the potting mix) ranges from 15 to 26% under general conditions, comparable to bark and greater than peat moss. Its high air filled porosity is great for our epiphytic orchids



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because it allows air to circulate around the roots. Sphagnum can hold up to 20 times its weight in water, so moisture is retained around the roots for subsequent uptake by the plant. Sphagnum moss holds enough moisture and stores positively charged nutrients like calcium, magnesium and potassium for later use rather than them being flushed through the pot. Of course this also means you have the potential to accumulate high concentrations of soluble salts. The acidic nature of sphagnum results in a root zone environment that is hostile to bacteria and fungi, which helps protect the roots from certain diseases and in fact can help nurse ailing orchids back to health.

**Grades of Sphagnum Moss.** There are approximately 150 species of Sphagnum moss found world-wide and these various species can differ greatly in size, color and chemical properties. *Sphagnum cristatum* is generally considered the highest quality moss available and grows natively in New Zealand. It is known for its robust leaf structure and longer stem lengths that are great for wrapping around roots. Some report good success with 5 star Chilean moss which is predominantly *Sphagnum magellanicum*. Chilean moss has shorter strands but is very leafy which can reduce the air available to the plant when compacted into a pot. Less expensive mosses may be found originating from Japan (typically *Sphagnum palustre*) and China (typically *Sphagnum palustre* or *Sphagnum cuspidatum*). Wisconsin and Canadian mosses are typically inexpensive and are a blend of several species native to their respective regions. These less expensive mosses tend to be more fragile, breaking down quickly and increasing the need for more frequent re-potting. This grade of sphagnum is okay if you plan to repot every 6 months, because that's about how long it will last in the pot before turning into a sodden mess that will suffocate the roots of your plant.

**Sources of Moss.** There are many choices of sphagnum moss available to growers. If possible, only buy the high quality, long fibered sphagnum moss. This high quality moss will last for 2 to 5 years in the pot depending on the quality of your irrigation water as well as how much you water and fertilize. Some report good success with 5 star Chilean moss although others believe the New Zealand moss is fluffier. If you can't find the high quality, long fibered sphagnum moss in your local stores, search online.

**Grades of Moss.** There is much confusion about the grades of sphagnum moss offered in commerce. Some producers use a star rating for their moss while others use letters or a combination of letters and numbers. It is difficult, if not impossible, to compare grading claims from one producer to another because they are likely different species. Besgrow, who also produces Orchidata, is moving away from alpha or numerical grading systems. Besgrow offers New Zealand *Sphagnum cristatum* in different grades which are distinguished primarily by strand length. The longer the strand the better the moss is suited for wrapping and achieving a high quality display (Besgrow, personal communication). You don't need to spend the extra money buying the highest quality moss unless you're planning to join the Fūkiran Society, but strand length is important particularly if you wrap the sphagnum around the roots rather than just mashing it into the pot. It would be best to use the moss labeled Supreme by Besgrow with its long strands



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ideal for wrapping roots, although this grade may be difficult to find in the USA. Don't use a quality lesser than the Premier grade for potting orchids in pure moss and not less than the Classic grade for putting together blends incorporating sphagnum.

| <b>Grades of New Zealand Sphagnum Moss Produced by Besgrow</b><br><b>All <i>Sphagnum cristatum</i></b> |   |
|--|---|
| <b>Besgrow Name</b>  | <b>Besgrow Spagmoss Description</b>   |
| Premier Strand   | 90% of strands longer than 16" (400mm). Bright natural color showing white/cream with some green tips. Uniform length moss all layered in same direction for high quality decoration and wrapping, for premium display.   |
| Supreme  | 80% of strands longer than 7" (175mm). Bright natural color showing white/cream with some green tips. Good bulk and thickness which allows excellent water retention giving good aeration and fertilizer holding. Very easy for root wrapping with beautiful aesthetic value. Long lasting in the pot, for premium commercial and high end hobby. |
| Premier  | 50% of strands longer than 6" (150mm). Various golden browns, cream and light greens. Good bulk which allows excellent water retention giving good aeration and fertilizer holding. Very easy for root wrapping and long lasting in the pot, for commercial and hobby.  |
| Classic  | 70% of strands longer than 4" (100mm). Various golden browns, browns, cream and light greens. May contain occasional stained or dull ends. Thickness varies but has good water retention giving good aeration and fertilizer holding. A good moss for standard retail and some hobby and good for lining baskets.                                 |

**General Guidelines.** Despite its many great qualities, many hobby growers avoid sphagnum because they have had orchids rot when potted in sphagnum. In year-round warm climates, many plants resent being grown in sphagnum moss, especially if the atmospheric humidity is very high. As a serial overwaterer, I have had my difficulties with orchids growing in sphagnum so here are some general rules for its use.

**Wrap the Root Ball.** Wrap the sphagnum moss around the root ball, don't just cram the sphagnum moss into the pot. For small plants out of flasks, compots or plug trays, wrap the sphagnum moss around the roots and insert the wrapped plant into a small pot. You don't have to be as meticulous about wrapping the moss strand by strand as when *Vanda* (syn. *Neofinetia*) *falcatas* are potted Japanese style, but take the time to wrap the moss. The longer the strands of moss are, the easier it is to wrap the roots particularly with larger plants.

**Pack Moss Firmly.** Sphagnum moss is much easier to work with when it's wet, so moisten it prior to use. Some people like to pack the moss into the pot very loosely believing this allows the moss to dry more rapidly. It may seem somewhat counterintuitive, but loose sphagnum moss actually holds more moisture than more tightly packed moss. Think of the moss as a sponge, when you squeeze a sponge it retains less water. On the flip side, if you pack the sphagnum very tightly into the pot, you can potentially compact it so much





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that you reduce its air holding capacity. I tend to take the middle ground and pack the sphagnum firmly but not densely around the plant, tightly enough that the plant holds itself upright in the pot.

*Smaller and Taller Pots Seem to Work Better.* Smaller pots seem to work better when using sphagnum. This may simply be a case of a smaller pot having a greater surface area to volume ratio so the moss tends to dry out more quickly. With pots larger than 4 inches, consider blending the sphagnum with porous material like styrofoam or leaving an air space below the sphagnum via the collaring technique. Pot shape is important too. Even though it seems backwards, taller pots of a given size dry faster than shallow pots. With open baskets and rafts, the moss can be packed a little more loosely because it is open to the atmosphere on all sides.

*Salt Retention.* Sphagnum moss will retain the salts present in your water supply as well as those introduced by your fertilizer. If you use a pure water like rainwater, this may be less of a problem, but many growers may have to compensate for the tendency to accumulate salts by flushing their pots regularly and using dilute fertilizer solutions or fertilizing half as often.

*Sporotrichosis, aka the Rose Thorn Disease.* Sporotrichosis is a rare infection caused by a fungus called *Sporothrix schenckii* that lives throughout the world in soil, plants and decaying vegetation, including contaminated sphagnum moss. Skin infection is the most common form of infection, although pulmonary infection can occur if a person inhales the microscopic, airborne fungal spores. Most cases of sporotrichosis are sporadic and occur through small cuts or punctures from thorns, barbs, etc. To avoid the potential for a problem, cautious individuals or those with a compromised immune system can wear gloves when working with sphagnum moss.



This Calanthe Baron Schröder has been in the same 8 inch bulb pot in long fibered New Zealand sphagnum for 4 years. I almost repotted it last year but the moss was still in good shape and the plant was growing so vigorously it was deforming the plastic pot. It had about 15 flower spikes last year. This year's blooming was even better.



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**When and How To Use Sphagnum.** Sphagnum may not work for all your potting needs, but there are certain situations in which sphagnum moss works better than any of the alternatives. Think of sphagnum as one more arrow in your quiver.

*Winter Dormant Orchids.* Winter dormant orchids like catasetums, habenarias and calanthes like a dry winter rest during which the top growth may die back and wither away. But when the bulbs wake up in the spring, they grow with wild abandon because they have to compress a year's worth of growing into their 7 or 8 month growing season. They require copious amounts of water and fertilizer to match their growth spurt. What could be more perfect for these vigorous summer growers than sphagnum, that stays evenly moist and retains nutrients. If you're growing outdoors where they receive lots of uncontrolled rainfall, keep the pots on the smallish size and top dress with timed release fertilizer, and then watch them grow. I used to repot my catasetums every year, but one day I asked myself why I felt compelled to traumatize the plants with the annual repotting marathon when the moss still had plenty of life left in it; so I didn't repot this year and now the catasetums are blooming earlier and more freely, with roots still happy in the long fibered New Zealand sphagnum moss.

*Water Loving Orchids.* As you might suspect, any of the moisture loving genera like bulbophyllums, masdevalias, jewel orchids and dendrochilums are good candidates for growing in sphagnum moss. Pot size and shape are critical, choose smallish pots. Even with bulb pans you might think of adding a layer of Styrofoam peanuts at the bottom. You can also use plastic or clay saucers if you drill holes in them.



This *Dendrochilum cobbianum* had a multitude of flower spikes. The pot it is growing in is hidden by the decorative pot in the image to the left. But in the image to the right you can see it is growing happily potted in sphagnum moss in an uber shallow saucer.

*Cool Growers in Warm Climates.* Sometimes you are determined to grow a type of orchid that is not well suited to your climate. For those in warm climates, potting the cool growers in sphagnum in a clay pot is an old grower's trick to try to lower temperatures a few



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degrees, particularly if they are grown in a shadier, cooler location. You can double down by dropping the clay pot into a second larger clay pot with a little sphagnum in between.

*Sphagnum to the Rescue.* Small seedlings, back bulbs and weak or sickly plants all need tender loving care. Sphagnum has antiseptic properties that help lower the incidence of rot as well as good water retention so delicate roots can develop, both great qualities when trying to nurse a sick plant back to health. You can try the sphag in a bag technique, where you put a little wet sphagnum at the bottom of a tall plastic bag (like the newspaper comes in), put two holes in the bottom of the bag and one at the top, drop the sick plant in and hang it in a shady location. If you're lucky you'll have roots and maybe a new growth within 6 months or so. Alternatively, just put the back bulbs or sick plant in a small pot packed with sphagnum and wait for the plant to grow new roots and sprout new growth from dormant eyes.



My experiment with growing stanhopeas in coco fiber didn't end well. Terry made a Jill Godfrey style raft out of hardware cloth to which I secured the remaining pieces of *Stan. grandiflora* and draped some sphagnum loosely around the roots in the that hope the plant will revive.



These plants from Alan Koch of Gold Country Orchids show how well the collaring technique works. The plant roots are wrapped with a thin band of sphagnum moss about half the depth of the pot and then placed in the pot with an open void space at the bottom into which the roots happily grow.





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Sure wish I had followed Keith Davis' advice to cover newly emerging roots with sphagnum moss before the roots got damaged.



The moss helps keep pests away, stimulates the roots to grow faster into the mix and keeps the green tips long and hydrated.

**Top Dressing.** You can use sphagnum as top dressing over your mix of choice. It is a simple way to protect new root growth when the roots are above the potting mix. It works particularly well on bifoliate cattleyas that generally only produce a flush of roots once a year so if they are damaged, the plant will suffer a setback. If you grow paphiopedilums in a low humidity environment, you might find the roots dry up before they can grow into the potting mix. A thin layer of sphagnum over your potting mix can supply the desired humidity.

**Collaring.** Here's an Alan Koch trick for small or seedling orchids. Use a small pot and wrap sphagnum around the roots about half the depth of the pot and insert the plug into the pot with the air space below it so the roots will grow into the void space between the sphagnum and pot.

**Sphagnum Blends.** If you find you have trouble with sphagnum or need to put an orchid in a pot larger than 4 inches or basket larger than 6 inches, you may consider creating a custom blend attuned to your growing situation. For outdoor growers, adding polystyrene chips, styrofoam chunks or other inert material to the sphagnum will help with the tendency to stay overly wet. If you like growing in bark, adding about 20% chopped sphagnum is reported to be an improved potting mix for growing phalaenopsis and phragmipediums.

**Repotting Out of Sphagnum.** If you decide sphagnum is not for you but you happen to buy an orchid growing in sphagnum, you will have to transition to a new mix. The roots growing in sphagnum have become acclimated to the moist acidic growing conditions. If you repot directly into a completely different type mix such as hydroton, the plant will have to grow a new set of roots acclimated to this different environment. If you find yourself in this predicament, consider potting into a transitional custom blended mix. A 50% ProMix HP and 50% coarse sponge rock mix works well for Phalaenopsis, although you may have to top dress with a thin layer of sphagnum to prevent the mix from washing out of the pot.



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For your other orchids, consider blending some sphagnum moss into your mix of choice the first time you're repotting out of sphagnum. Others recommend removing a part of the sphagnum from around the plant base and watching for the plant to begin its rooting cycle. When new roots begin to emerge, carefully remove the rest of the sphagnum moss from around the roots and repot.



Culture king Andy Phillips uses green tree moss in small baskets and on some mounts. We'll be experimenting with it, report to follow!



This *Angcm. calceolus* from Andy's Orchids is a monster bloomer that loves growing in green tree moss and being watered every other day.

For wateraholics, there is another moss of potential interest, green tree moss, sometimes called shag or sphagnum mountain moss. I discovered this moss when I bought an angraceum from Andy's Orchids last fall that was in a small basket filled with this new (to me) moss. Check out Andy's booth at orchid shows, it is filled with plants potted in small baskets or mounted with this moss. Green tree moss is airy and does not retain moisture like sphagnum so it can be watered frequently without becoming sopping wet although it is probably best used in small volumes so it will dry rapidly.

There are two challenges to overcome when using sphagnum moss. The first is finding a high quality moss, which used to be synonymous with AAA long fibered New Zealand sphagnum moss. If you search online, you will find several Besgrow grades being offered as AAA sphagnum. Caveat Emptor. The second is learning how to water plants growing in sphagnum. This basically means don't water until the moss approaches dryness. Once you master the ins and outs of sphagnum moss, you will understand why so many commercial orchid nurseries grow and sell their plants in long fibered sphagnum moss.

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