GROWERTALKS

Features

8/24/2010

# Potting Media: For Peat's Sake

*Hugh A. Poole and Jamie L. Gibson*

At the recent Seeley Conference, a presentation was made recommending a ban on the harvest of peat moss and its use in horticulture. This concept has been hotly debated in Europe over the past 20 years, and rightly so. The European debate is greatly influenced by two major issues:

1) Historically, the predominant use for peat in northern Europe is for fuel in lieu of oil or coal, and 2) The draining of bogs and wetlands for peat harvest and agriculture threatens critical habitats for migratory birds. These are two very hot topics within the environmental and conservation movements. It was only a matter of time before these issues arose in North America, as well. However, the situation as it relates to the U.S. horticultural industry is distinctly different.

The importance of peat

In England, more than 90 percent of the bogs have been damaged or destroyed, and in Germany and the Netherlands, few peatlands remain in their original condition. Compromises were made allowing the remaining bogs and wetlands to be purchased and set aside as conservation sites and reclaimed in these countries. Ireland closely regulates the harvest of peat for fuel and horticulture and has established a national peatland conservation program.

Canada is a major supplier of horticultural peat in the world, with exports to Asia, Africa and the Americas. It has more than 270 million acres of peatlands, of which only 40,000 acres (one acre in 6,000 or 0.02%) are used for peat harvesting. In comparison, more than 49 million acres of Canadian peatland (18%) have been permanently converted to agricultural, industrial or urban uses. Approximately 95 percent of the peat harvested in Canada is used in the horticultural industry.

Peat moss was first used in the United States as a fuel source and as bedding material for horses, chickens and other animals. After World War II, peat became a major player in the horticultural industry as a soil amendment and component in the greenhouse industry. Initially, the greatest demand for peat was as a soil amendment for gardening and landscaping to loosen heavy soils and increase water and nutrient retention in

sandy soils. This market grew dramatically with increases in suburban housing, athletic fields and golf courses. Peat moss was and still is an ideal source of organic matter—it's light, clean and free of weeds and diseases. And because of its spongy characteristic, it can be compressed by a factor of two and transported long distances by truck or container. Due to these attributes and relatively cheap transportation costs, Canadian peat moss was often preferred over local sources of peat and other organic materials in the United States.

The pendulum is swinging the other direction today in regards to peat being used in the gardening and landscape industry. Now most soil amendments in garden centers are primarily bark and recycled or composted yard wastes, with very little peat. They are heavier, locally available, regionally blended and relatively cheap. Their value is that they provide an aggregate for loosening the soil, and they provide organic matter to support biological activity in the soil. Many states and communities have mandated that these waste products be removed from waste streams and landfills and used in recycling efforts. Peat moss continues to be a superior soil conditioner, but there are adequate alternatives in many parts of the country.

In the late 1960s, Cornell's "Peat-Lite" potting mixes were introduced to our industry for container production. Dr. John Seeley referred to the era prior to this as "BP" (before plastic). Plastic greenhouse coverings reduced the start-up costs for entering our industry. Lightweight plastic pots, trays and baskets expanded a grower's offerings and encouraged regional production for faraway markets. A thriving economy, fueled by the Baby Boom generation, increased the demand for container-grown plants and growing media throughout the United States. Our industry prospered during these times, evolving from mineral soil-based mixes to peat-based mixes and growing crops faster and better than before. A number of factors accounted for our phenomenal growth in the latter half of the 20th century. And just as in Europe, the floricultural industry grew in peat-based media.

Why peat moss?
What's so special about peat moss? There are many reasons: 1) Peat is readily available in North America; 2) it's conducive to mechanized harvest; 3) it's easily processed, screened and packaged; 4) it can be palletized; 5) it optimizes weight to volume for economical trucking; and 6) it can be stored for a year or more with no noticeable change in properties.

These are the industrial reasons why peat moss is so highly regarded, the criteria that all other media components are compared to in regards to cost and utilization. Literally, peat is harvested like hay, cleaned like grain, shipped like hardgoods and used as needed onsite. For comparison, the same volume of peat moss can be shipped six times farther for the same transportation cost as a bulk load of pine bark or compost.

The horticultural properties of peat moss are what really provide added value to the production of container-grown crops. There are over 300 species of sphagnum in the world. They modify the ecology by covering wetlands and shallow lakes. The leaves and stems float on the surface of the water. As the unspecialized cells die, they sink to the bottom and form peat deposits under anaerobic conditions. In nature, 1 to 2 mm of peat accumulate each year to ultimately form a peat bog.

The horticultural value of peat moss is due to the unique properties of the sphagnum cells. The sole purpose

of these thin-walled cells with large cavities is to absorb and transport water. An important characteristic is the cells' lignified walls, built in the form of rings, spirals or plates that prevent them from collapsing when they become dry. This property continues long after the plant dies and forms the peat that we harvest. As water evaporates from the cells, air fills the pore because the thickened walls do not collapse. As long as the peat is suitably moist, optimum conditions of moisture and aeration can be maintained for plant growth. This capability to absorb and transport water up to a height of 18 inches is a very simple capillary system.

Another property of sphagnum cells is that they are "surface active," meaning they can absorb water as well as nutrients; because they are single cells, there's a lot of surface area for absorption to occur. These nutrients are readily given up for absorption by the plant roots. Other organic sources require composting before they can perform in a similar fashion, so this attribute is important in the discussion of sustainability, as the use of peat moss improves the efficiency of both water and fertilizer use in crop production.

Container production is the heart of our floral industry. We grow in them. We transport them to our customers. We even use them in our marketing programs. However, containers present a specific challenge for growing media. Good, fertile field soil performs poorly in a container because its fine particles provide only small pores for the exchange of air and water. Field soil relies upon the uninterrupted pull of gravity to pull air into the root zone. The bottom of a pot or flat disrupts the gravitational pull on the water column in the container. We refer to this phenomenon as a "perched water table." When the mix in the pot is thoroughly wetted, there is a moisture gradient, with the bottom being saturated and the surface being moist. Pores in the growing medium hold either water or air at any given time. In the above situation, there is an inverse gradient for air in the mix. There's more air at the surface than at the bottom of the container. The substrate relies upon the capillary movement of water against the force of gravity to introduce air back into a saturated container. When comparing components for growing media, these physical properties are very important.

Peat moss readily exchanges air for water and water for air within the confines of a container. Other fibrous (sedge peat, rock wool, etc.) or granular products (perlite, coir, etc.) may absorb water like a blotter but do not provide the air exchange and capillary movement as peat does. Aggregates, like bark, may adsorb water on the surface, but they don't improve water availability to the plant.

There are plenty of reasons why peat is the perfect horticultural element. And though desire for horticultural peat is strong—total revenues in 1999 were approximately $170 million Canadian) and the industry employed thousands of residents in rural areas of Canada—peat is accumulating over 70 times faster each year in Canada than it's being harvested. In addition, the Canadian Sphagnum Peat Moss Association (CSPMA) carefully monitors these peatlands, actively endorsing and participating in preservation programs and the restoration or reclamation of harvested sites.

It's important to note that Fafard and many other companies harvesting peat moss in Canada are members of the CSPMA.

Peat moss is classified as a slowly renewable resource that is being replaced more rapidly than it's being harvested in Canada. It's valued as an important component to the livelihood of many commercial growers and the satisfaction of millions of home gardeners. No other component performs as well or at a comparable cost. It's clear peat is a precious asset. And like any treasure, it's one that should be protected for long-term availability. **GT**

*Acknowledgement: A valuable resource used in this article is the CSPMA website (www.peatmoss.com) along with a Finnish publication, Peat and Its Use in Horticulture by Viljo Puustjarvi, translated to English by William G. C. Krause and published in 1977.*

---

*Hugh A. Poole is director of technical services and Jaime L. Gibson is director of research and development for Conrad Fafard, Inc. in Anderson, South Carolina.*