

JOHN'S CORNER

Soil Amendments - Peat Moss

By John Ferguson

Peat Moss is widely used in gardening and horticulture. However have you ever considered the question; is it the best choice and what are the consequences of using it?

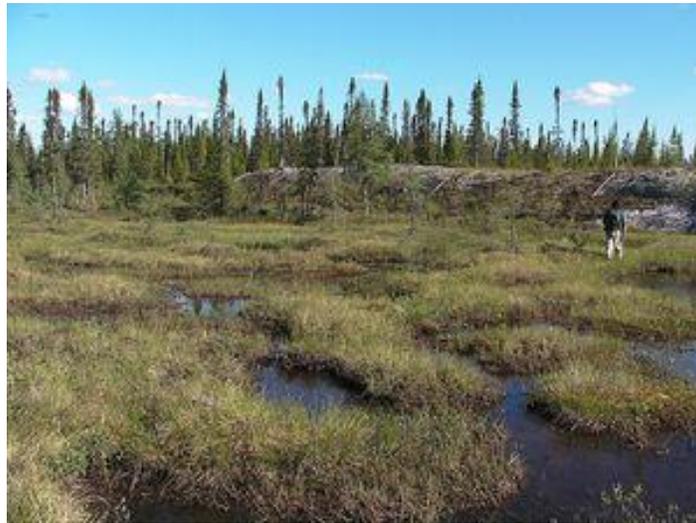
Historically, peat has been used as a fuel, for insulation, for building bricks, as a planting medium, and as a top dressing for potted plants in floral arrangements.

Peat moss is from a group of plants called Sphagnum that is a genus of over 350 species of mosses. These plants grow in wetlands found in cooler climates and are an extremely important part of our ecosystem in cleaning water, removing pollution and storing carbon dioxide from the atmosphere (more than any other ecosystem). These bogs capture 110 tons of carbon every year from the atmosphere and store more than 562 billion tons of carbon even though they compose only 3% of the land and fresh water areas. Mining of peat requires the draining of wetlands, drying, milling, packaging and transportation of the product many thousands of miles to market, all of which require energy which releases tremendous amounts of CO₂ to the atmosphere.

Some companies in Canada and in the Northern states have started trying to reestablish bogs after mining which is a step in the right direction. However, scientists say it takes over 90 years to just reestablish the original biodiversity and much longer to become a fully functioning wetland.

Over 10 million cubic yards are harvested each year in Canada and another 1 million cubic yards in the USA. It takes about 1,000 years for a one yard thick layer of peat to accumulate; hence tens of thousands of acres of wetlands are destroyed each year.

Peat forms over many thousands of years in these bogs, swamps and other wetlands. Peat grows on the surface of the bog where there is oxygen. As the plants die they settle to the bottom where there is very little if any oxygen (anaerobic) and slowly decays forming thick mats of partially decomposed plant material.



This decayed and dried sphagnum moss is often called peat or peat moss. More correctly the live moss growing on top of a bog is called Sphagnum moss and the dead decaying matter underneath is called sphagnum peat moss or just peat moss. These plants provide a habitat for other wetland plants like sedges, orchids, carnivorous and many other plant species.

More than 90% of the extremely valuable wetland peat bogs in England and New Zealand have been destroyed by the mining of peat. Many countries now prohibit or have placed severe restrictions on the mining of peat wetlands and the sale of peat moss.

Sphagnum and peat due not decay readily due to phenolic compounds in the plants cells. As the new moss grows it pushes the older moss down into the bog where it slowly decays often reaching many feet in thickness with the older more decomposed peat moss at the bottom.



The most valuable form of peat in horticulture is the layer that forms just under the surface with deeper layers becoming lower and lower in quality and value. This is why a gardener often sees big price differences for peat moss at the garden centers. The worthless low quality peat moss is sold at the lower prices because it does not work well.

The reason this low quality peat moss is sold, is for the producers of peat moss to make more money. Once they have spent the money to dig ditches and drain the wetland, construct roads, create drying



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beds, etc. to mine the good peat moss, it costs very little extra to remove the worthless bottom layers also. They just package it up and sell it. High quality peat moss is often used for growing orchids. The standard low quality peat moss (and most other products) sold in most chain nurseries and box stores works poorly if at all, making many people think they do not have a "green thumb."

The surface moss and the high quality peat moss layer can hold 16-20 times their dried weight in water in their cells. The low quality peat moss at the bottom does not hold near the same amount of water or have the beneficial properties hence it is sometimes sold under the name of "Peat Humus" to get unsuspecting customer to buy it.

Due to its very acidic nature, peat moss can absorb cations (plant nutrients) such as calcium and magnesium and release hydrogen ions into the soil (which causes the acidity). It is so acidic it can kill bacteria (good or bad), and as a result was used as a bandaging material in treating wounds as recently as WWII.

Several companies selling peat moss recommend using it as a mulch. It makes a terrible mulch for many reasons:

- 1) It is highly acidic and by extension very bad for most plants, it forms unsightly surface cracks when it dries out.
- 2) It is very light, causing it to blow and wash away in wind and rain events.
- 3) It is dusty and difficult to apply (especially when it is windy), and it provides very little if any nutrition to the plants.

Horticultural research has shown that we now have many alternatives to peat moss that work better, at lower cost, and do not have the environmental consequences. A few of these are composted bark, compost and mulches, substrates made from cow manure, brewery wastes, coconut coir, olive mill waste, pulp and paper by products, peanut hulls, and of course perlite, vermiculite and pumice. Even PTS (Pine Tree Substrate) has been found to work better on many species of plants. Many of these substrates have repeatedly worked better than peat in terms of plant vigor and quality!

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- readily available
- light in weight
- good structural stability
- ability to hold water
- good aeration (high porosity) IF sphagnum peat moss
- low in microbes
- good to store bulbs and tubers over the winter as it is anti-microbial (Ancient cultures used peat to store food in)

CONS:

- virtually devoid of nutrients
- extremely acidic (low pH) and must be neutralized for use with most plants
- very difficult to re-wet once it becomes dry
- repels water when dry
- often not sterilized and may contain pathogens
- inhibits the growth of microbes initially but quickly becomes conducive for the rapid development of pathogens
- peat moss from lower layers is often very fine in particle size and as a result does not have good aeration as the better grades do
- low anion capacity hence negatively charged anions like phosphate and nitrate will easily leach from the media



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- Some people experience a skin disease causing lesions when exposed to peat moss (rare). It is from the fungus Cutaneous sporotrichosis and is more common with sphagnum moss. Several states have laws requiring nursery workers to wear double gloves and micron filtration masks when handling peat moss. Those using peat moss regularly are at risk for developing pneumonias and other illnesses.

Conclusion:

Peat moss is environmentally bankrupt in today's gardening environment and one should not purchase and use it.