materials have low cation exchange capacities while organic components have a greater ability to retain cations. Pine bark has a cation exchange capacity in the range of 10 to 13 milliequivalents per 100 cubic centimeters while a CEC of approximately 1 is common for builders' sand.

Although a high nutrient-holding capacity is desirable, some thought must be given to soluble salt buildup which may injure plants. Media with desirable water-holding and aeration characteristics will usually allow for periodic leaching necessary to prevent or reduce salt accumulation. Salt accumulation is generally not a problem unless the irrigation water is saline or the fertilizer source, rate and/or scheduling result in excess salt concentrations. Container media with 50 to 60 percent peat or pine bark of moderate particle size (1/8 to 3/8 inch; 0.3 to 0.9 cm) have proven to have adequate CEC for efficient production of woody plants in containers.

Carbon to nitrogen ratio (C:N)

Rapid decay of organic matter in container media can result in decreased volume and a subsequent decreased aeration of the medium. Materials with a high cellulose (carbon) to nitrogen content will be decomposed rapidly by microorganisms in the soil. Not only will particles become smaller, but nitrogen that would normally be available for plant uptake will be utilized by microorganisms. Sawdust and shavings have a higher C:N than other organic matter such as peat and bark. Sawdust has a C:N ratio of about 1,000 :1 while bark has of ratio of approximately 300 :1. Decomposition of these organic particles is initially rapid and the rate of decomposition decreases with time. Therefore, older or composted materials will decompose more slowly than freshly-produced sawdust. Management of fertilization to maintain the proper nutrient concentration in the growth medium is extremely important if optimum plant growth is to be obtained when using fresh organic material with a high C:N. It is important to eliminate fresh wood contamination of the bark. Remember the C:N ratio of wood is three times greater than of bark.

Organic components

Peat. The most common growth medium component for container production is peat moss. However, there can be tremendous diversity among the characteristics of peat from different sources or different locations within an individual peat bog. Peat must have a high fiber content to provide internal water-holding capacity (small pores) yet allow drainage of pores between particles (large pores). If a peat appears oily when wet or is slick rather than fibrous when rubbed between your fingers, it may not be suitable for use in producing container-grown plants.

Peat is a term which applies to a type of soil formed from partially decomposed mosses or sedges which accumulate in bogs over a period of hundreds or thousands of years. Although the term "peat moss" is widely used, it is not correct. The correct designation should be "moss peat," which indicates those peats formed from moss plants. Sphagnum peat is the preferred peat of most greenhouse operators because of its high water holding capacity, adequate air space, high cation exchange capacity and resistance to decay. Sphagnum peat is formed from sphagnum mosses in very acid bog conditions which preserve most of the plant fiber structure. The acidity of many sphagnum peats ranges from pH 3.0 to 4.0.

Hypnum peats are derived from hypnum mosses and have a higher and much broader pH range (4.0 to 7.5), and less persistent fibers than sphagnum peat.

Other peats consist of fibers of sedges, reeds and grasses. These peats are especially susceptible to decomposition, especially in the presence of fertilizer solutions. Peats which break down rapidly cause media shrinkage and compaction, a condition which hampers plant growth and makes the containerized medium difficult to manage. Many Florida peats are derived from sedges, reeds and grasses.

Peats with a fibrous quality are better than those reduced to a powdery consistency due to either decomposition, plant origin or harvesting and processing procedures. Very fine grades of peat are the least desirable unless mixed at the proper ratio with larger, porous particles because they have more of a predominance of small pore space than coarser grades. The peat selected should have some fiber structure and be brown in color when dry. Material which has decayed further, such as that found in muck soils, is black and has a powdery consistency when dry. Muck is a very poor component for any potting medium.

Peats derived from sedges, reeds and grasses have the ability to bind certain soil-applied, plant growth regulators, such as Cycocel, more than other types of peats. For this reason soil-applied growth regulator test reports should specify the type of peat and other media component used.

Pine bark. In the southeast, several pine species are important forest crops. As the wood is utilized the bark is removed mechanically. For many years this bark was regarded as a waste product that required a disposal site where the material could be stockpiled.