MOSS PEAT - FOR PROPAGATION AND PLANT GROWTH[1,2]

R. E. Widmer

Moss peat has been used as a soil conditioner for many years. If not too finely milled, it lightens heavy soils by increasing the air space and improves the water holding capacity of sandy soils. In 1928, Alex Laurie (2) proposed the use of a peat and sand mix for growing annuals.

What is peat? It is partially decomposed vegetable matter which has accumulated under anaerobic conditions in bogs and marshes. Peats are classified according to their plant origin - sedges, mosses, reeds and other grasses. The most widely used types are formed under cool, moist conditions, especially the sphagnum moss peats. Large bogs of moss peats are found in Europe, Canada, Maine, Wisconsin and Minnesota. Other types of peat may be suitable for use if of good quality.

Roll-Hansen (6) grew tomatoes in nutrient enriched peat in Norway from 1940 to 1960. Penningsfeld (4) started developing procedures for growing horticultural plants in an all peat medium about 1950. Puustjarvi (5) of Finland initiated his experimental program with peat as a growth medium in the 1950's. Woods and others (8) in Ireland followed suit shortly thereafter. Nutrient enriched moss peat is now a widely used growth medium in greenhouses in many European countries.

Although several types of peat are considered satisfactory for plant growth if the proper chemicals are added and cultural procedures are properly adjusted, partially decomposed sphagnum moss peat is usually preferred by horticulturists.

The sphagnum moss peat has a pH of 3.8 to 4.5, a low nutrient content, few microorganisms and is high in pore space (89-96 percent by volume). At field capacity, approximately 54 percent of the pore space is occupied by water and 40 percent by air. Thus a wide margin of error in frequency of watering is possible without killing the plants if drainage is adequate. Such a peat weighs less than one-half that of an equal volume of water. Bulk density refers to the dry weight of a given volume of peat and indicates the degree of humification (decomposition). Fertilizer holding capacity (cation exchange) on a weight basis is quite good. Hypnum moss peat and some reed sedge types have similar physical properties (3) but are not as generally available or as uniform in quality. Thus they are not as commonly used.

Nutrient Requirements: Basic additions of nutrients to the moss peat prior to planting are necessary for optimum results. The addition of calcium is essential. Quantity of calcium required is in direct proportion to the degree of composition of the peat. Bagge Olsen (1) has determined the quantity required by various peats. If dolomitic limestone is added, the quantity recommended is approximately double the amount of calcium limestone required since the quantity of calcium is a key factor. At least a portion of the nitrogen applied is in slow release form. A high proportion of ammonium nitrogen is undesirable as it is

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[2] Adapted from a talk presented at the Commercial Flower Growers' Short Course held on the St. Paul Campus, University of Minnesota; October 11, 1972.

toxic to nitrifying bacteria. Phosphorus should be added initially and at regular intervals during the forcing period as it leaches fairly freely from peat, opposed to its retention by loam soils. Potassium may also be applied regularly. Trace element deficiencies are common because of the low initial content in the peat and their propensity to leaching. Incorporation of a mixture of slow release trace elements (e.g. fritted) provides good results. Trace element deficiencies in loam soils are also becoming more common. Although regular application of nutrients to moss peat are needed, excessive applications must also be avoided (as with loam soils).

Quantities of nutrients mixed in the peat will vary with the purpose (propagation or growth) and crop grown.

A sample listing of additions follows:

Nutrient material added	Propagation quantity per bushel	Growth/most crops
ground limestone	200 grams	200 grams
magnesium sulfate	20	80
calcium nitrate	6¼	6¼
potassium chloride	4	20
superphosphate	12½	50
coated 14-14-14	16	50
fritted trace element mix	0.7	1.4

Commercial formulations of nutrient enriched moss peats are also available. Their nutrient content is not necessarily the same as the above listing.

Watering: Watering is a key point and the common tendency is to wait too long between waterings. If the peat is so dry that water is not released when the peat is squeezed in the hand, it is too dry for proper plant growth. Peat that becomes too dry requires more than one watering for thorough rewetting. Wetting agents can be used to facilitate wetting or rewetting the peat. If using a wetting agent for the first time, use it on a limited scale to determine if the plants grown are sensitive to the product used. No negative plant reactions resulted in limited trials with Aqua-Gro (0.33 percent solution) and WEX (1-1000) at the University

If a highly decomposed peat is used, more calcium is required and it will be much easier to overwater. Blending such peats with perlite or similar materials will improve their air content and drainage. The same applies to peat that is milled too fine. Small pores fill with water and large pores are needed to retain air. An air content of less than 10 percent is undesirable.