

Commercial *Peat* and Native Organic Materials in Connecticut

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The present circular supersedes Station Circular 142 (*Peat and Swamp Muck for Soil Improvement in Connecticut*), now out of print. Additional information from laboratory studies on peats has been obtained which has added to our knowledge on the use of peats in crop growing. This circular has been prepared to make this material available to the people of the State and to others interested in the use of peat.

Commercial Peat and Native Organic Materials in Connecticut

H. G. M. Jacobson and C. L. W. Swanson¹

Connecticut abounds in deposits, usually small, of more or less decomposed organic matter commonly known as peat and muck. Many of the deposits can be used as a source of organic matter for incorporation in the soil. A few deposits in the State have been worked and the peat sold commercially.

Incorporating peat into soils, particularly to those low in organic matter, improves the soil in several ways. Peat increases their water intake, reducing water loss by runoff and decreasing soil erosion. Addition of peat to soils improves their water-holding capacity, and once water is absorbed, it is retained in the soil better. Peat acts like a sponge in taking up water. Less of the water drains through the soil and smaller amounts are lost by evaporation.

Peat serves as a conditioner in soils high in clay, improving their tilth and workability. Soils in good physical condition also resist water and wind erosion better. Soil bacteria on decomposing peat produce organic gums. These gums stick the fine particles of the soil into larger particles or aggregates. Thus, the air spaces between the larger particles are larger in size, a condition which is more conducive to water and air movements in the soil. Because of the resistant lignin type of organic material occurring in peat, it decomposes slowly so that its beneficial effect is spread over several years. Peat absorbs heat, and soils to which peat is added warm up earlier in the spring.

Peat has little fertilizing value, its use being more beneficial as a source of organic matter and as a soil conditioner. Fertilizers, especially nitrogen, must be applied to soils to which peat has been incorporated

¹Department of Soils

for best plant growth. Peat may be expected to furnish some minor elements such as boron, copper, zinc, cobalt, etc., but the amounts never would be very great. Peat also prevents excessive leaching of valuable plant nutrients as, for example, soil nitrates. Nitrogen tied up chemically with organic matter is the only form in which this element can be stored in the soil for any appreciable period.

Comparison of the composition of some native peats and commercially available peats is given in Table 1. The native peats vary considerably in ash content. The Canadian and German peat mosses contain less water than the Michigan peat moss. The latter peat was packed in a cellophane sack which was protected by a laminated paper bag. This kept the water from evaporating and according to the producer, preserved moist conditions for optimum bacterial activity. Generally, the water-holding capacity of the native peats was somewhat less than that of commercial peats.

TABLE 1. COMMERCIAL PEAT AND NATIVE ORGANIC MATERIALS

Source of peat	Acidity pH	Ash %	Water as received %	Water- holding capacity %	Pounds per 100 lbs. as received			
					N ¹	P ₂ O ₅ ¹	K ₂ O ¹	Organic matter
<i>Commercial</i>								
Canadian peat moss	3.81	2.5	7.8	950	1.77	trace	0.220	89.9
German peat moss	3.85	1.8	8.0	1400	0.91	0.045	0.081	90.3
Michigan peat moss	4.88	8.2	58.3	509	0.79	0.053	0.034	38.3
Average	4.18	4.2	24.7	953	1.16	0.033	0.112	72.8
<i>Native</i>								
Montowese	4.72	57.9	57.1	401	0.20	0.054	0.080	18.1
Manchester	5.02	41.5	62.1	433	0.34	0.064	0.075	22.2
Glastonbury	4.05	48.2	65.0	578	0.32	0.045	0.120	18.1
Saybrook	3.53	7.0	85.5	642	0.17	0.010	0.030	13.5
Average	4.33	38.7	67.4	514	0.26	0.043	0.076	18.0

¹Analyses by Analytical Chemistry Department

Source of Peat Materials

Commercial

Canadian peat moss — Maple Leaf Brand, Horticulture Peat Moss, Prov. Quebec.
 German peat moss — Purchased locally.
 Michigan peat moss — Michigan Peat Moss Company, Capac, Michigan.

Native

Montowese peat moss.
 Manchester peat moss.
 Glastonbury peat moss.
 Saybrook peat moss.

Two of the commercial peats were more acid than the Connecticut peats. In every case the nitrogen content of the commercial peats was higher. The amounts of the other fertilizing elements varied. In any case, none of the peats contained sufficient fertilizing nutrients or lime for optimum plant growth. Lime should be added for decreasing the acidity and complete fertilizers like 7-7-7, 10-10-10, 5-8-7 and the like applied for bringing up their nutrient level. Since the peat is usually mixed with the soil, samples for soil testing should be taken after thoroughly mixing it with the soil. The required lime and fertilizer applications, as shown by the soil test, should be applied to the soil-peat mixture.

The greater the percentages of ash and water in the organic materials, the less the amount of organic matter. The native materials reported in the present study averaged less than 20 per cent organic matter and two of the commercial peats averaged 90 per cent. The third commercial peat analyzed 38 per cent organic matter.

If moist peats are purchased in bulk (bushel, cubic yard, cord), there is considerable shrinkage when they are dried. The average of eight samples received for analyses shrank 56 per cent on drying to 105° C. for 24 hours as shown in Table 2. The amount of shrinkage varied, being as high as 78 per cent for a peat containing 87 per cent moisture and 38 per cent for one containing 43 per cent water.

TABLE 2. AVERAGE SHRINKAGE OF MISCELLANEOUS NATIVE PEAT MATERIALS AS RECEIVED FOR ANALYSIS

Sample No.	Water content as received	Shrinkage volume
	%	%
1	76.0	56.3
2	86.8	78.1
3	66.7	43.8
4	42.9	37.5
5	74.6	65.3
6	69.2	43.8
7	77.3	52.6
8	82.3	67.6
Average	72.0	55.6

Moist peats, when purchased by weight or bulk, are expensive, if water and ash are considered at their true values. It is possible to obtain native organic materials low in ash but their water content will depend on their degree of dryness. Most peats are dried somewhat before being placed on the market, the extent of drying depending on the facilities available.

Before peat is taken out of the deposits, the peat bog should be drained and then worked up with a plow, disc harrow, cultivator or other convenient cultivating implement. After the worked-up peat material has

partially dried, it should be transported to a well drained area for further drying and eventually screened.

The product thus obtained is still quite moist, usually containing from 60 to 80 per cent of water. In such condition, it is quite bulky and rather heavy in proportion to the actual dry substance it represents. Shredded and screened moist swamp peat of average quality weighs approximately 1200 pounds per cubic yard, representing about 300 pounds of dry material and about 225 pounds of actual organic matter. However, there is much variation from the above figures for individual lots. Retail prices are largely dependent upon the quantity required by the purchaser and the distance from the location of the swamp to the point of delivery.

Since organic matter is definitely the purpose for which these materials are purchased, one should be sure that he is buying organic matter and not principally water and ash (ash includes mostly sand, silt, and clay). Connecticut peat, when attention is given to its composition, has been found useful as a source of organic matter on lawns (3), for vegetable production (2), in tobacco seedbeds (1) and for greenhouse soils.

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