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MINES AND GEOLOGY BRANCH
BUREAU OF MINES

PEAT MOSS OR SPHAGNUM MOSS

Its Uses in Agriculture, in Industry,
and in the Home

BY

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FOREWORD

It is, perhaps, unknown to most Canadians that since the commencement of the war Canada has become an important producer of peat moss. When supplies from Europe to this country and the United States were cut off, active attention was given to the development of domestic deposits, with the result that many plants have since been brought into production in scattered areas throughout the Dominion. The output from these plants is mostly exported to the United States as the Canadian consumption is relatively small.

Possibly the demand in the United States will decline in post-war years and, if so, the decline could be largely offset by a marked increase in the present use of peat moss in Canada. Comparatively few Canadians, however, are familiar with its many uses in agriculture, industry, and the home. It is the purpose of this booklet to acquaint them with these uses in the hope that an extensive market will be built up within the country, so that the industry can become firmly established as a continuing enterprise.

DIRECTOR,
MINES AND GEOLOGY BRANCH

July 2, 1943.

PEAT MOSS OR SPHAGNUM MOSS

ITS USES IN AGRICULTURE, IN INDUSTRY, AND IN THE HOME

Peat moss is a term used in the trade for dead, fibrous, slightly humified moss that has been excavated from peat bogs, dried to a moisture content not exceeding 30 per cent, shredded, screened into sizes according to the requirement of the trade, and pressed into bales or smaller packages.

Of the fibrous peats occurring in nature, the sphagnum mosses provide the best quality peat moss for the market. The several species of sphagnums vary in quality in regard to absorptive value, but all are of appreciably higher grade than any other fibrous peats, for example, reed peat, sedge peat, hypnum moss, or heath humus. Sphagnum moss occurs in every province in Canada in deposits ranging in size from a few acres to several thousand acres, the tonnage of many deposits being comparable with those of the largest peat bogs in Europe. Many deposits are within easy reach of shipping facilities and as the mosses from most of the important bogs are superior in quality to those imported from Europe (see analyses, Bureau of Mines Memorandum Series Nos. 80, 81, and 83), sphagnum moss alone should be produced for the open market, so that Canada may retain its reputation of producing a high-grade article. If other fibrous peats derived from sedge, reed, hypnum, wood, etc., are produced they should be labeled accordingly, to avoid misrepresentation.

Prior to the war, the Canadian production of peat moss was small and Canada and the United States obtained their supplies chiefly from Europe. When these were cut off, the industry in Canada began to expand and since the commencement of the war many plants have been brought into production. The output is fairly large and is mostly exported to the United States.

Uses for Peat Moss

Although it has been used widely and with satisfactory results in Europe for many years, peat moss has been used as yet only to a limited extent in Canada. For this reason, the claims made in reference to the uses given below are based mainly on the experience of recognized specialists on the subject in Europe. Certain of the claims made in regard to the use of peat moss in Canada can be readily substantiated; others can be neither proved nor disproved until such time as sufficient

experience in the uses concerned is acquired. Nevertheless, it seems reasonable to assume that, in the main, the results in Canada will be as satisfactory as those for similar uses in Europe.

Peat moss owes its usefulness to its high absorptive capacity for liquids and gases; resistance to decomposition; low conductivity of heat; elasticity; and to its deodorizing quality. There is some evidence also of its satisfactory use as an acid disinfectant.

AGRICULTURE

Stable Bedding. Peat moss has the requirements of a good stable litter and surpasses in quality all other materials used for that purpose since it provides for the animals a warm, clean, dry, and elastic bedding; absorbs and retains excrement, and increases the fertilization value of the manure by retaining the more valuable parts thereof. Peat moss itself is an efficient soil conditioner. It holds the moisture longer than does manure if applied to a sandy light soil, and it makes heavy clayey soil lighter by allowing circulation of air and more rapid movement of water to the plant roots. It improves sanitation of stables by its absorption of gases and by its general qualities as a deodorant. Foot and mouth disease among cattle appears to be less frequent and much less virulent when peat litter is used for stable bedding.

For stables and pens, the bedding can be easily kept dry and clean by removing the damp parts and replacing with fresh moss litter. Such bedding may last upwards of a month before an entire change becomes necessary. It is reported that one ton of peat moss will serve as long as $2\frac{1}{2}$ tons of straw, thus lightening the work in the stables, for not only is less handling required but a peat litter bedding keeps the animals cleaner.

When peat moss is used in sties as bedding for pigs their skin is much less apt to become inflamed and the offensive odour of the sties is greatly decreased. This pertains to all animals except sheep, in which case the fine peat is likely to penetrate into the wool and is difficult to remove.

Poultry Farms. Peat-moss poultry litter has been acclaimed as being of prime importance to the health and comfort of the flock. When used as bedding in the pens the intervals between cleanings may be appreciably increased, and it absorbs the droppings of the birds to form a valuable manure, rich in nitrogen. Peat-moss litter makes a warm flooring and nesting and when scattered in the chicken runs provides an ideal scratching material. Letters submitted by the operators of two poultry farms in Michigan, each raising thousands of baby chicks yearly,

chickens for the poultry market, and hens for laying, and using peat moss by carload lots, state that the use of peat moss litter gives the birds comfort, health, and freedom from vermin and that this materially aids in diminishing losses through death and disease. As a result, the weight and quality of the poultry, and the egg production are increased.

Peat manure has a value several times that of straw manure, and thus the purchaser of peat moss for use as bedding for animals stands to profit from the sale or use of the manure. It has less than half the volume of straw manure and does not have the offensive odours of the latter.

Horticulture and Market Gardens. These are at present the largest consumers of peat moss in Canada and the United States. Sphagnum peat moss is not a fertilizer, but is of importance as a soil conditioner; as a filler in commercial fertilizers which, if used alone, would "burn" the plant growth; and as a base for composting manure. Other fibrous peats such as carex, sedge, hypnum, and especially reed peat, are noticeably high in plant food, but this advantage far from compensates for their physical inferiority. In gardens peat moss is used extensively as a soil conditioner, and being free from weed seeds, serves as an excellent soil dressing. In nurseries and horticultural farms it is widely used. As a mulch, it virtually prevents growth of weeds and effects greater retention of moisture in the soil. A mulch of peat moss will protect the more tender plants and shrubs from being winter-killed. The use of peat moss tends to produce healthier and more advanced plants.

Horticulturists find it very useful for packing bulbs, tubers, and roots for winter storage. They are protected against the cold weather and remain firm throughout the winter. Similarly, live or slightly humified sphagnum moss ("floral moss") is used for shipping flowers, shrubs, etc., in cold weather. Successful overseas shipments of plants and saplings are made by covering the roots with moist peat moss and wrapping them in live sphagnum moss.

Peat moss is used extensively in making, renovating, and remaking lawns. It improves the texture of the soil and retains sufficient moisture for the grass roots. Golf clubs are among the best customers in Canada, using it for improvement of the greens and gardens.

INDUSTRY

Artificial Fertilizers. Peat moss has a variety of uses in industry. Mixed with waste from fisheries and packing houses,

it makes an efficient fertilizer, rich in nitrogen and phosphate, which, owing to the deodorizing quality of the moss, is free from offensive odour. Peat moss filler in commercial fertilizers facilitates the use of many materials otherwise difficult to handle. Many kinds of waste matter from packing houses absorb moisture from the air and either cake or give off offensive odours. Peat moss largely prevents this decomposition and absorbs gases released.

Stock Food. It is used in Europe and in the United States for the preparation of various stock foods, particularly those compounded with the uncrystallized residues from beet and cane sugar refineries. Molasses, although a valuable food stuff, requires an effective diluent owing to its viscous condition and its extreme laxative action when concentrated. Peat moss converts the crude molasses into a convenient and stable product and largely prevents digestive disturbances. It also adds a small amount of protein and improves the palatability of the food. It is claimed that as much as 50 per cent of molasses may be used in stock foods when mixed with peat moss. Its corrective qualities make it a desirable material also for admixture with cotton seed meal. When used for stock food it must be prepared from the purest obtainable sphagnum moss free from dust and ground to a certain size of grain.

Building Trade. Peat moss is one of Nature's most efficient insulators. It is used to some extent in the building trade in wall spaces and between the rafters in roofs. It does not readily ignite and it keeps the house warm in winter and cool in summer. It is used in floors, partitions, and ceilings as a soundproofing. It preserves the wood, and vermin do not thrive in it. In Germany peat boards are impregnated with chemicals to render them fireproof. In Alberta there is an appreciable production of peat boards and several thousand houses in and about Edmonton are insulated with this material.

Packing Material. Peat mull, the finest screening of peat moss, and to a certain extent the coarser sizes, have been used extensively in Europe as packing material for perishable products, especially for shipments overseas of products sensitive to dampness, and for fragile wares such as glass or crockery. The moss adds little to the weight of the package. Owing to its excellent insulating quality it provides protection against frost in winter; and in summer chilled fruit and vegetables packed in peat moss will keep cool for a long time.

Peat Pads. In Western Canada a number of producers manufacture peat moss pads on a fairly large scale. They are used for the shipment of asparagus cuttings and keep the vegetable moist and crisp for several days.

Metallurgy. A recent use is in the production of metallic magnesium and a large part of the Canadian peat moss is thus used.

IN THE HOME

Peat moss is an excellent agent for preserving food. Hard fruit and vegetables will keep in good condition throughout the winter if packed in it. Onions, potatoes, etc., will not sprout prematurely; nor will fruit and vegetables emit offensive odours. The storage place retains a fresh atmosphere. Soft fruit and vegetables will keep appreciably longer if packed in peat moss. Eggs have been kept for six months or longer, and meat and fish for two weeks or more. During 1942, oranges, bananas, and eggs packed in fine peat mull were sent overseas by parcel post to patients in military hospitals in England. The recipients stated that the fruit arrived in perfect condition, and that the eggs were fresh and on boiling did not have the usual musty taste.

In packing food of all kinds there should be at least two inches of peat moss between the packed material and the walls and bottom of the container. Peat moss used for storage will last almost indefinitely as it does not readily decompose and if it becomes damp from usage it can be easily dried by spreading it out in the sun. In ice houses, it makes the ice last longer and prevents the formation of fungi and mildew if packed in the spaces between the wall boards, under the floor, and between the rafters of the roof.

On farms and in small communities in Europe without sewage systems peat moss has been used for a long time as a deodorant and disinfectant in earth closets and cess pools.

OTHER USES

It has many other active and potential uses, military and otherwise.

Surgical Dressing. Peat moss, and particularly fibrous peat from *Eriophorum* (cotton grass) specially treated, makes very good surgical dressing, and was used during the war of 1914-1918 by the armies of the Allies and the Central Powers. The United States army used 600,000 pads made of moss obtained from

bogs in that country. It was found to be an excellent substitute for absorbent cotton. A similar material made in France, known as peat batting or peat wool, was used widely during the war for bandaging. It was also employed as filler for mattresses, pillows, and for upholstery in the military hospitals.

Peat moss has many potential war uses as a substitute for materials difficult to obtain. These include its use as a substitute for cork in the insulation of aeroplanes; as linoleum filler; in the form of peat yarn for the manufacture of coarse blankets for horses and cattle; as peat fibre mixed with wool for making underwear, which is said to be warmer than that made of all-wool owing to the insulating property of peat; in making paper and cardboard; sweeping compounds; and as the raw material for manufacturing various chemicals, waxes, alcohol, and dyestuffs.

When used in making building brick it yields a product of high porosity, light in weight, and a good heat and sound insulator.

The value of peat moss for the foregoing uses has long been recognized in Europe and very large quantities are so consumed. Sweden, for example, has a yearly production of between four and five million bales, in addition to which a large quantity of loose litter is produced by individual farmers from their small bogs. All of this, except an export of 600,000 bales, is consumed within the country.

If the demand for peat moss in Canada were proportionate to that of Sweden, on the basis of population, there would be a marked expansion of the Canadian industry. An industry of comparative size in Canada would support from 14,000 to 15,000 employees in seventy plants of 100,000 bales yearly capacity each, distributed across the Dominion. The equipment and maintenance of these plants would, furthermore, give much indirect employment.

Producers of Peat Moss in Canada

(As of July 1st, 1943)

Operator	Address	Products
NEW BRUNSWICK—		
Fafard Peat Moss Company.	Shippigan.....	Moss for horticulture and for litter.
Western Peat, Limited*	Shippigan.....	Moss for horticulture and for litter.
QUEBEC—		
Canada Peat, Limited (La Tourbière, Rivière du Loup).	Rivière du Loup, 319 Lafontaine St.	Baled insulation moss as loose material; also for horticulture and for litter. (Plant at St. Antonin).
Excel Peat Company...	Rivière du Loup.....	Moss for horticulture and for litter.
Father Point Peat Bog (Tourbière Pointe au Père).	St. Anaélet.....	Horticulture moss, poultry moss.
Premier Peat, Limited	Isle Verte (New York, 150 Nassau St.)	Baled insulation moss as loose material; also for horticulture and for litter.
Quebec Peat Moss Company.	St. Guillaume.....	Horticulture moss, poultry moss.
Les Tourbières Rivière Ouelle.	Ste. Anne de la Pocatière	Packing moss as loose material for insulation in bags or in bales; also for horticulture and for litter.
Waterville Moss and Peat Mine.	Waterville.....	Packing moss, as loose material, baled moss, and dried top moss.
ONTARIO—		
Arctic Peat Moss Corporation, Ltd.	Winnipeg, 200 Sterling Securities Building.	Moss for horticulture and for litter.
Arnold, Edward.....	Atherly.....	Packing moss.
Canadian Humus Products Reg'd.	Toronto, 100 Adelaide St.	Partly humified peat and marl mixture. Plant food.
Canadian Industries, Ltd.	Chatham.....	For own use as fertilizer filler.
Erie Peat, Limited.....	Welland, 105 E. Main St.	Moss for horticulture and litter.
Grand Valley Peat* Moss Company, Ltd.	Toronto, 112 Yonge St.	Moss for litter and horticulture.
McKenzie, R. W.....	Clinton.....	Insulation moss, as loose material.
Polar Bear Peat Moss Products Reg'd.	Fort Frances, Ont.....	Horticultural moss and poultry litter.
Spinks, Harold.....	Havelock, R.R. No. 4..	Top moss.
Stinson-Reeb Supply Company.	Montreal, Que., 5585 De- lorimier Ave.	Peat humus, sphagnum floral moss, insulation moss, horticultural moss, poultry litter, stable bedding.

* Not in production.

Producers of Peat Moss in Canada—Continued

(As of July 1st, 1943)

Operator	Address	Products
MANITOBA—		
McCabe Bros. Grain Company.	Winnipeg, 980 Grain Ex- change.	Poultry litter, horticultural moss.
McMillan, Norman.....	Lac du Bonnet, Box 102..	Poultry litter, horticultural moss.
Winnipeg Supply and Fuel Company.	Winnipeg, 812 Boyd Building.	Poultry litter, horticultural moss.
ALBERTA—		
Moss-Tex, Ltd.....	Edmonton, 10728-102 Ave.	Insulation moss in the form of boards; sphagnum moss for litter and agriculture; and sphagnum pads.
BRITISH COLUMBIA—		
Allouette Peat.....	Vancouver, 510 Hastings St. W.	Sphagnum moss for litter and horticulture, and sphagnum pads for packing.
B.C. Peat Company, Ltd.	Vancouver, Royal Bank Bldg.	Sphagnum moss for litter and agriculture.
Byrne Road Peat Farm	Burnaby, 2707 McKay St.	Sphagnum moss for litter and agriculture.
Coast Peats, Ltd.....	Vancouver, 736 Gran- ville St.	Sphagnum moss for litter and agriculture.
Excelsior Peat, Ltd....	Vancouver, 6633 Yew St.	Sphagnum moss for litter and agriculture.
Industrial Peat, Ltd....	New Westminster.....	Moss for metallurgical purposes.
Lulu Island Peat Com- pany, Ltd.	Eburne, 279 Road No. 5, R.R. 2.	Sphagnum moss for litter and agriculture.
North American Peat, Ltd.	Vancouver, 208 Pacific Bldg.	Sphagnum moss for litter and agriculture.
Northern Peat Moss Company, Ltd.	Eburne, R.R. 2.....	Sphagnum moss for litter and agriculture.
Pacific Peat Products, Ltd.	Vancouver, 5611 High- bury St.	Sphagnum moss for litter and agriculture.
Western Peat Company, Ltd.	New Westminster, Box 825.	Sphagnum moss for litter and agriculture, moss pads, also moss for metallurgical pur- poses.

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