PEAT

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Peat is a renewable natural organic material of botanical origin and commercial significance. Peat resources (peatlands) are situated in wetland areas, primarily in the temperate and cold belt of the Northern Hemisphere, where large deposits developed from the gradual decomposition of plant matter under anaerobic conditions. The United States contains approximately 15% of the world's peatlands by area (Lappalainen, 1996, p. 11). There are more than 400 million hectares (Mha) of peatlands on Earth, of which 80% has remained undisturbed. Of the 80 Mha that has been used by humans, 50% has been used for agriculture; 30%, for forestry; 10%, for miscellaneous uses; and 10%, for peat extraction. Peat continues to accumulate on 60% of global peatlands; however, the volume of global peat resources decreases at a rate of 0.05% per year owing to human activity (Joosten and Clarke, 2002, p. 33-35).

Peat has widespread use as a plant-growth medium in a variety of horticultural and agricultural applications, where its fibrous structure and porosity promote a unique combination of water-retention and drainage characteristics. Commercial applications include potting soils, lawn and garden soil amendments, and turf maintenance on golf courses. In industry, peat is used primarily as a filtration medium to remove deleterious materials suspended in municipal storm-drain water, pathogens from sewage effluents, and toxic materials from process waste streams. In its dehydrated form, peat is a highly effective absorbent for fuel and oil spills on land and water.

The United States is a significant producer and consumer of peat for horticultural and industrial purposes. Peat was extracted and processed from 54 identified operations in 15 States of the conterminous United States and by several companies in Alaska. The grades of peat are classified according to the degree of decomposition component of the plant material with sphagnum moss being the least decomposed followed by hypnum moss, reed-sedge, and humus, which is the most decomposed.

Production

Domestic production data for peat were developed by the U.S. Geological Survey (USGS) from a voluntary survey of operations in the conterminous United States. Of the 56 operations to which a survey request was sent, 37 responded, representing 75% of total production; two companies were inactive. Data for nonrespondents were estimated based on 2002 data or other sources. Peat production in 2003 was 634,000 metric tons (t), which represented a slight decrease from that of 2002 (table 1). Output from Alaska was 22,937 cubic meters in 2003 according to the Alaska Department of Natural Resources, which conducted its own survey of mineral production in the State (Szumigala and Harris, 2004, p. 9). Production was reported by volume only. Reed-sedge composed 87% of domestic peat production, followed by humus, 5%; hypnum moss, 5%; and sphagnum moss, 4 % (table 4). Florida, Michigan, and Minnesota accounted for 85% of U.S. production (table 3).

Consumption

Sales of domestic peat fell by 13% to 632,000 t from 728,000 t in 2002. Packaged products composed 29% of total domestic sales tonnage and commanded premium prices for all grades of peat. Apparent consumption decreased slightly from that of 2002. General soil improvement and potting soil mixes were the two largest usage categories, accounting for 89% of domestic sales tonnage and volume. Other significant uses included golf course application, mixed fertilizers, nursery applications, and seed inoculants. The United States imported about 55% of its total domestic requirements, primarily from Canada where deposits of high-quality sphagnum moss are extensive. Canadian peat was sold in bulk for blending in custom soil mixes and packaged for horticultural use, however a detailed distribution of uses was not available.

Stocks

U.S. yearend stocks of peat decreased by 13% to 180,000 t (table 4). Reed-sedge peat accounted for 90% of total stocks, followed by humus, sphagnum moss, and hypnum moss.

Prices

The total reported free on board (f.o.b.) value for domestic peat sold in the United States was $18.8 million according to the annual survey of domestic peat producers. The average unit value increased to $29.74 per metric ton compared with $28.85 per ton in 2002 (table 1). On a unit-value basis, packaged sphagnum moss was valued at $63.20 per ton, f.o.b. plant; hypnum moss, $78.37 per ton; reed-sedge, $43.88 per ton; and humus, $18.38 per ton (table 7).

Foreign Trade

Imports of peat increased slightly to 767,000 t from 763,000 t in 2002 (table 8). The total customs import value was $148 million, or about $193 per ton. Imports of sphagnum moss from Canada increased to 754,000 t, which represented 98% of total imports and 56% of total Canadian production (tables 8, 9). U.S companies exported 29,000 t of peat (table 1).

World Review

In 2003, 24 countries were reported to have produced peat (table 9). In decreasing order, Finland, Ireland, Germany, Belarus, Russia, Estonia, and Canada were the largest producers. Other significant producing countries included Sweden, Ukraine, the United States, Latvia, and Lithuania, in decreasing order. Peat is an important source of energy in Finland and Ireland and in Eastern Europe to a lesser extent.

Canada.—Production of sphagnum moss decreased slightly to 1.34 Mt (table 9). New Brunswick, Quebec, and Alberta were the major producing provinces, accounting for 77% of production by tonnage. British Columbia, Manitoba, Newfoundland, Nova Scotia, Prince Edward Island, and Saskatchewan also reported peat production (Natural Resources Canada, 2004§[1]).

Outlook

Because peat is the primary constituent of growing media, the demand for peat generally follows that of horticultural applications. Since 2000, domestic consumption, production, and sales of peat have declined gradually after experiencing rapid growth in the 1990s. The decrease has been attributed to a combination of a reduction in the number of greenhouse and nursery crops, weaker economic conditions, higher imports of these products, and weaker demand for ornamental plants (U.S. Department of Agriculture, 2004§). In addition, large growers tend to use peat as a constituent of custom soil blends rather than as an individual product, which has reduced peat sales. Domestic peat production will likely continue to decrease slightly in the short-term because of the factors previously discussed and greater imports from Canada. Other factors, such as Federal and State wetlands regulations, restrictions on permitting new production sites, and competition from other organic soil amendments, will have a negative influence on the domestic peat industry.

[1]References that include a section mark (§) are found in the Internet References Cited section.

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Peat. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.

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TABLE 1
SALIENT PEAT STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

	1999	2000	2001	2002	2003
United States:[2]					
Number of active producers	58	61	57	55	54
Production	731	792	736 r	642	634
Sales by producers:					
Quantity:					
Bulk	444	483	500	515	447
Package	390	364	320 r	213 r	185
Total	834	847	820 r	728 r	632
Value	22,100	22,700	21,100 r	21,000 r	18,800
Average value dollars per metric ton	26.48	26.85	25.75 r	28.85 r	29.74
Average value, bulk do.	25.83	23.45	22.91	22.74	22.60
Average value, packaged or baled do.	27.23	31.36	30.18 r	43.61 r	46.98

See footnotes at end of table.

TABLE 1--Continued
SALIENT PEAT STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

	1999	2000	2001	2002	2003
United States--Continued:[2]					
Exports	40	37	31	32	29
Imports for consumption	752	786	776	763	767
Consumption, apparent[3]	1,580	1,530	1,500 r	1,420	1,400
Stocks, December 31, producers'	272	279	257	207	180
World, production	27,000 r	24,700 r	25,700 r	27,400 r	26,100 e

eEstimated. rRevised.

[1]Data are rounded to no more than three significant digits, except average values per metric ton.

[2]Exclusive of Alaska.

[3]Apparent consumption equals U.S. production plus imports minus exports plus adjustments for industry stock changes.

TABLE 2
RELATIVE SIZE OF PEAT OPERATIONS IN THE UNITED STATES

Size	Active operations		Production (thousand metric tons)	
(metric tons per year)	2002	2003	2002	2003
23,000 and more	7	7	494	500
9,000 to 22,999	5	4	63	43
5,000 to 8,999	8	8	53	55
1,000 to 4,999	9	12	24	29
Less than 1,000	26	23	9	7
Total	55	54	642	634

TABLE 3
U.S. PEAT PRODUCTION AND SALES BY PRODUCERS IN 2003, BY STATE[1]

			Sales		
Region and State	Active operations	Production (thousand metric tons)	Quantity (thousand metric tons)	Value[2] (thousands)	Percentage packaged
East:					
Florida	8	379	373	$7,440	--
Pennsylvania	4	8	8	219	82
Other[3]	6	13	19	840	43
Total or average	18	401	401	8,500	4
Great Lakes:					
Michigan	9	125	125	3,460	81
Minnesota	12	34	60	5,070	75
Other[4]	11	69	42	1,680	14
Total or average	32	228	226	10,200	67
West[5]	4	5	5	90	10
Grand total or average	54	634	632	18,800	29

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Values for free on board producing plant.

[3]Includes Maine, New Jersey, New York, and West Virginia.

[4]Includes Illinois, Indiana, Ohio, and Wisconsin.

[5]Includes Iowa, Montana, and Washington.

TABLE 4
U.S. PEAT PRODUCTION AND PRODUCERS' YEAREND STOCKS IN 2003, BY TYPE

Type	Active operations	Production[1] (metric tons)	Percentage of production	Yearend stocks[1] (metric tons)
Sphagnum moss	8	24,400	4	6,090
Hypnum moss	5	29,300	5	408
Reed-sedge	30	550,000	87	162,000
Humus	11	30,300	5	12,100
Total	54	634,000	100	180,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 5
U.S. PEAT SALES BY PRODUCERS IN 2003, BY TYPE AND USE[1]

	Sphagnum moss			Hypnum moss			Reed-sedge		
	Quantity			Quantity			Quantity		
Use	Weight (metric tons)	Volume[2] (cubic meters)	Value (thousands)	Weight (metric tons)	Volume (cubic meters)	Value (thousands)	Weight (metric tons)	Volume (cubic meters)	Value (thousands)
Earthworm culture medium	44	349	$9	--	--	--	386	610	$8
General soil improvement	43,800	286,000	2,580	12,800	24,100	$642	143,000	266,000	3,690
Golf courses	7,080	33,800	597	--	--	--	14,600	39,500	2,380
Ingredient for potting soils	227	765	11	14,000	23,600	462	335,000	542,000	6,450
Mixed fertilizers	--	--	--	--	--	--	9,300	15,700	195
Nurseries	1,610	5,840	92	626	1,070	15	20,200	33,900	425
Packing flowers, plants, shrubs, etc.	267	1,070	18	--	--	--	--	--	--
Seed inoculant	--	--	--	--	--	--	4,080	4,590	60
Vegetable growing	--	--	--	--	--	--	1,020	1,720	24
Other	--	--	--	--	--	--	1,360	4,590	750
Total	53,100	327,000	3,310	27,400	48,800	1,120	529,000	1,150,000	15,800

	Humus			Total		
	Quantity			Quantity		
	Weight (metric tons)	Volume (cubic meters)	Value (thousands)	Weight (metric tons)	Volume (cubic meters)	Value (thousands)
Earthworm culture medium	978	1,620	$17	1,410	2,580	$34
General soil improvement	8,510	13,000	151	208,000	589,000	7,060
Golf courses	333	482	5	22,000	73,800	2,980
Ingredient for potting soils	2,420	3,040	45	352,000	569,000	6,970
Mixed fertilizers	795	956	19	10,100	16,600	214
Nurseries	2,870	4,400	57	25,300	45,200	589
Packing flowers, plants, shrubs, etc.	272	382	3	539	1,450	21
Seed inoculant	408	459	6	4,490	5,050	66
Vegetable growing	478	524	8	1,500	2,240	32
Other	5,390	6,490	95	6,750	11,100	845
Total	22,500	31,400	406	632,000	1,320,000	18,800

-- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Volume of nearly all sphagnum moss was measured after compaction and packaging.

TABLE 6
AVERAGE DENSITY OF DOMESTIC PEAT SOLD IN 2003

(Kilograms per cubic meter)[1]

	Sphagnum moss	Hypnum moss	Reed-sedge	Humus
Bulk	250	591	608	741
Package	144	475	513	704
Bulk and package	162	562	583	716

[1]To convert kilograms per cubic meter to pounds per cubic yard multiply by 1.685.

TABLE 7
PRICES FOR PEAT IN 2003[1]

(Dollars per unit)

	Sphagnum moss	Hypnum moss	Reed-sedge	Humus	Average
Domestic:					
Bulk:					
Per metric ton	59.98	30.67	20.99	17.45	22.60
Per cubic meter	14.99	18.14	12.77	12.93	13.19
Packaged or baled:					
Per metric ton	63.20	78.37	43.88	18.38	46.98
Per cubic meter	9.11	37.19	22.52	12.93	15.83
Average:					
Per metric ton	62.36	40.77	26.40	18.08	29.74
Per cubic meter	10.11	22.92	15.39	12.93	14.29
Imported, total, per metric ton[2]	XX	XX	XX	XX	193.49

XX Not applicable.
[1]Prices are free on board plant.
[2]Average customs value.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF PEAT MOSS, BY COUNTRY[1]

	2002		2003	
Country	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)
Canada	751,000	$147,000	754,000	$146,000
Denmark	1,300	315	1,230	463
Finland	285	56	235	59
Germany	107	33	191	83
Ireland	6,140	455	6,760	484
Italy	--	--	102	12
Latvia	2,680	634	3,700	1,140
Netherlands	140	36	60	39
New Zealand	1,910	364	37	70
Other[3]	137	98	123	129
Total	763,000	149,000	767,000	148,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Customs value.
[3]Includes Chile, China, Estonia (2003), France (2003), Lithuania (2003), Russia (2002), Sri Lanka (2002), the United Kingdom (2002), and Vietnam (2002).

Source: U.S. Census Bureau.

TABLE 9
PEAT: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country[3]	1999	2000	2001	2002	2003[e]
Argentina, horticultural use	11 [r]	11 [r]	10 [r]	8 [r]	9 [4]
Australia[e]	15	3	5	5	5
Belarus:[e]					
Horticultural use	100 [4]	100	100	100	100
Fuel use	3,090 [4]	2,000	2,000	2,000	2,000
Total	3,190 [4]	2,100	2,100	2,100	2,100
Burundi, fuel use	20	4	7 [r]	7 [r]	7
Canada, horticultural use	1,253	1,277	1,319	1,385 [r]	1,341 [4]
Denmark, horticultural use[e]	200	247 [r]	287 [r]	290 [r]	295
Estonia, horticultural use and fuel use	1,299	760	844	1,508 [r]	1,500
Finland:					
Horticultural use	1,595	1,174	834 [r]	770 [r]	800
Fuel use	4,140 [e]	3,932	5,368 [r]	6,450 [r]	7,000
Total	5,735	5,106	6,202 [r]	7,220 [r]	7,800
France, horticultural use[e]	200	200	200	200	200
Germany:[e]					
Horticultural use	2,500 [r]	2,500 [r]	2,600 [r]	2,500 [r]	2,500
Fuel use	20 [r]	15 [r]	--	--	--
Total	2,520 [r]	2,515 [r]	2,600 [r]	2,500 [r]	2,500
Hungary, horticultural use[e]	45	45	45	45	45
Ireland:[5]					
Horticultural use[r]	320 [r]	325 [r]	300 [r]	350 [r]	375 [4]
Fuel use	3,104 [r]	5,378 [r]	4,600 [r]	4,138 [r]	2,739 [4]
Total	3,424 [r]	5,703 [r]	4,900 [r]	4,488 [r]	3,114 [4]
Latvia, horticultural use and fuel use	956	456	555	560 [e]	560
Lithuania, horticultural use and fuel use	390	246	273 [r]	513 [r]	500
Moldova, fuel use[e]	475	475	475	475	475
New Zealand, horticultural use[e]	22	24	24	24	24
Norway, horticultural use[e]	30	30	30	30	30
Poland, horticultural use	310	380	325	316 [r]	320
Russia, horticultural use and fuel use	3,350	2,100	2,100	2,100	2,100
Spain[e]	50	50	50	50	50
Sweden:[e]					
Horticultural use	440	300 [r]	400	540 [r]	450
Fuel use	800	400	700	850 [r]	750
Total	1,240	700 [r]	1,100	1,390 [r]	1,200
Ukraine, horticulural use and fuel use[e]	1,000	1,000	1,000	1,000	1,000
United Kingdom[e]	500	500	500	500	500
United States, horticultural use	731	792	736 [r]	642	634 [4]
Grand total:	27,000 [r]	24,700 [r]	25,700 [r]	27,400 [r]	26,100
Of which:					
Horticultural use	7,760 [r]	7,410 [r]	7,210 [r]	7,200 [r]	7,120
Fuel use	11,600 [r]	12,200 [r]	13,100 [r]	13,900 [r]	13,000
Unspecified	7,560 [r]	5,110 [r]	5,330 [r]	6,240 [r]	5,970

[e]Estimated. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through June 25, 2004.

[3]In adddition to the countries listed, Austria, Chile, Iceland, Italy, and Romania produced negligible amounts of peat.

[4]Reported figure.

[5]Fiscal year data.