

PEAT

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Peat is a renewable, natural, organic material of botanical origin and commercial significance. Peatlands are situated predominately in shallow wetland areas of the Northern Hemisphere, where large deposits developed from the gradual decomposition of plant matter under anaerobic conditions.

Peat has widespread use as a plant-growth medium in a variety of horticultural and agricultural applications. 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 toxic materials from process waste streams, pathogens from sewage effluents, and deleterious materials suspended in municipal storm-drain water. In its dehydrated form, peat is a highly effective absorbent for fuel and oil spills on land and water.

The United States remained a significant producer and consumer of peat for horticultural, agricultural, and industrial purposes. A variety of peat types were extracted and processed from 58 identified operations in 17 of the conterminous United States (table 3) and by several companies in Alaska. The grades of peat included, in order of importance, reed-sedge, sphagnum moss, hypnum moss, and humus. About 90% of U.S. production was from Florida, Michigan, and Minnesota. U.S. production, sales, and consumption of peat increased for the third consecutive year (table 1). The United States imported slightly less than one-half of its total domestic requirements, principally from Canada, where deposits of high-quality sphagnum moss are extensive; imports of sphagnum peat from Canada decreased slightly.

Production

Domestic production data for peat were developed from a voluntary survey of operations in the conterminous United States by the U.S. Geological Survey (USGS). Of the 80 operations to which a survey request was sent, 62 responded; this represented 89% of total production. In 1999, 4 of the 62 operations were idle. Peat production was 731,000 metric tons (t), which was a 7% increase compared with that of 1998 (table 2).

Domestic production was dominated by operations in Florida, Michigan, and Minnesota (table 3). Reed-sedge peat accounted for 80.9% of production by weight, followed by sphagnum moss, 8.3%; hypnum moss, 5.7%; and humus, 5.1% (table 4). Peat production in Alaska was estimated to be 29,000 cubic meters in 1999, according to the Alaska Department of Natural

Resources (Szumigala and Swainbank, 2000), which conducted its own survey of mineral production in the State. Production was reported by volume only.

The American Group, Inc., which operated peat and soil blending facilities in Florida, purchased Torland Co., which was a Canadian-based peat producer. The acquisition included all Torland's bogs and sorting, blending, and shipping facilities in Quebec. The American Group will use the peat for production of horticultural soils and growing media at their existing facilities (American Group, 1999).

Consumption

Sales of domestic peat increased by 5% to 834,000 t compared with those of 1998. Packaged products composed 47% of total domestic sales tonnage and commanded premium prices for all grades except humus. Apparent consumption increased by 11% to 1.58 million metric tons (Mt) compared with that of 1998. General soil improvement and potting soil mixes, which were the two largest usage categories, accounted for 85% of domestic sales. Other significant uses included mixed fertilizers, nursery applications, golf course application, and seed inoculants. Imports of sphagnum moss from Canada accounted for nearly 50% of U.S. consumption. Canadian peat was sold in bulk for blending in soil mixes and packaged for horticultural use.

Stocks

U.S. yearend stocks of peat decreased by 34% to 272,000 t (table 4). Reed-sedge peat accounted for 97% of total stocks, followed by humus, sphagnum moss, and hypnum moss.

Prices

The total reported f.o.b. value for domestic peat sold in the United States was \$22.1 million, according to the USGS annual survey of domestic peat producers. The average unit value increased to \$26.48 per metric ton compared with \$24.26 per ton in 1998. Packaged peat sold for a higher value for all grades except humus. On a unit-value basis, packaged sphagnum moss was valued at \$113.80 per ton, f.o.b. plant; hypnum moss, \$78.36 per ton; reed-sedge, \$25.90 per ton, and humus, \$17.87 per ton (table 7).

Foreign Trade

Imports of peat decreased slightly to 752,000 t in 1999 (table

8). The total customs import value was \$149 million, or \$198.72 per ton. Imports of sphagnum moss from Canada dropped slightly to 750,000 t, which represented 57% of total Canadian production. The United States exported 40,000 t of peat.

World Review

World production increased by 18% to 27.2 Mt in 1999, as production in Northern Europe returned to normal levels after wet weather during the 1997-98 harvest seasons reduced production (table 9). In order of importance, Finland, Ireland, Germany, Belarus, Russia, and Canada were the largest producing companies; other significant producing countries included Sweden, Estonia, the United States, and Latvia. Peat was an important source of energy in Ireland, Scandinavia, and the former Soviet Union (FSU). In 1999, at least 13.3 Mt of reported world production was for fuel use. Most of the unspecified uses were believed to have been for horticultural use (Hood, 1997); information was not, however, available to make an accurate estimate.

Estimated production from countries of the FSU accounted for a significant portion of global peat production, although output from the region has decreased since 1990. Political restructuring, the reduced use of peat as a fuel, and unfavorable economic trends were believed to have been major factors responsible for the drop in production.

Canada.—Production of sphagnum moss increased by 15% to 1.306 Mt in 1999 (table 9). In order of importance, New Brunswick, Quebec, and Alberta were the major producing provinces, (Natural Resources Canada, 2000). Exports to the United States decreased slightly to 750,000 t.

United Kingdom.—The Department of the Environment, Transport, and the Regions completed the second annual report of a 3-year study to monitor changes in the pattern of supply and consumption of peat and alternative materials used as soil improvers and growing media within the United Kingdom. The study contained data on consumption by amateur gardeners, local government authorities, and private landscaping contractors. Data from commercial horticultural growers were being collected in a separate study. The latest results, which were for 1996-98, showed that demand for growing media and soil improvers was level between 1997 and 1998. The proportion of peat consumed versus alternative materials decreased to 61% in 1998 from 68% in 1996. This reflected a decrease in the size of the growing media market, which was dominated by peat, and an increase in the soil improvement market, which was dominated by alternatives, rather than a substitution for peat. The amount of peat used remained greater than other materials and showed no evidence of losing dominance (UK Department of Environment,

Transportation, and the Regions, May 2, 2000, Monitoring the assessment of peat and alternative products for growing media and soil improvers in the UK, Second Annual Report, accessed June 23, 2000, at URL <http://www.detr.gov.uk/planning/peat1998/index.htm>).

Outlook

The outlook for horticulture and associated business is bright because global demand for plants, flowers, ornamental trees, natural turf, and outdoor recreational activities continue to grow at impressive rates. The outlook for domestic peat industry, therefore, will likely be governed by several variables, including future wetlands environmental regulations, the ability to permit new bogs, growth and competition from recycled yard wastes and other natural organic materials, Canadian competition, and the degree of market penetration by flowers and ornamental plants from offshore.

References Cited

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- Swainbank, R.C., and Szumigala, D.J., 2000, Alaska's mineral industry 1999—A summary: Alaska Department of Natural Resources Information Circular 46, 14 p.

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

- Peat. Ch. in Mineral Commodities Summaries, annual.¹
- Peat. Ch. in Minerals Yearbook, annual.¹
- Peat. Ch. in United States Mineral Resources, Professional Paper 820, 1973.

Other

- Lappalainen, Eino, ed., 1996, Global peat resources: Jyväskylä, Finland, International Peat Society, 360 p.
- Peat. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
- Thibault, J.J., 2000, Peat industry review 1999: New Brunswick Department of Natural Resources and Energy, 4 p.

¹Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1
SALIENT PEAT STATISTICS 1/

(Thousand metric tons, unless otherwise specified)

	1995	1996	1997	1998	1999
United States:					
Number of active producers	64	59	56	60	58
Production	648	549	661	685 r/	731
Sales by producers	660	640	753	791 r/	834
Bulk	339	325	432	399 r/	444
Package	320	314	320	392 r/	390
Value of sales	thousands \$17,000	\$18,500	\$17,500	\$19,200 r/	\$22,100
Average per metric ton	\$25.80	\$28.90	\$23.23	\$24.26 r/	\$26.48
Average per metric ton, bulk	\$22.54	\$23.90	\$21.65	\$24.98 r/	\$25.83
Average per metric ton, packaged or baled	\$29.24	\$34.00	\$25.34	\$23.52 r/	\$27.23
Exports	20	19	22	30	40
Imports for consumption	669	667	754	761	752
Consumption, apparent 2/	1,170	1,240	1,310	1,430 r/	1,580
Stocks, December 31: Producers'	384	342	421	408	272
World, production	29,900 r/	31,700 r/	28,400 r/	23,000 r/	27,200 e/

e/ Estimated. r/ Revised.

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

2/ 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 (metric tons per year)	Active operations		Production (thousand metric tons)	
	1998	1999	1998	1999
23,000 and over	9	10	460	563
9,000 to 22,999	8 r/	3	130 r/	46
5,000 to 8,999	8	12	57	77
2,000 to 4,999	9	9	25	32
1,000 to 1,999	6 r/	6	8 r/	9
Under 1,000	20	18	5	4
Total	60	58	685 r/	731

r/ Revised.

TABLE 3
U.S. PEAT PRODUCTION AND SALES BY PRODUCERS IN 1999, BY STATE 1/

Region and State	Active operations	Production, (thousand metric tons)	Sales		
			Quantity (thousand metric tons)	Value 2/ (thousands)	Percent packaged
East:					
Florida	8	309	408	\$8,180	25
Pennsylvania	4	7	6	185	36
Other 3/	6	71	44	1,810	49
Total or average	18	386	458	10,200	29
Great Lakes:					
Michigan	8	178	195	4,520	75
Minnesota	12	57	53	5,110	37
Other 4/	13	98	116	2,120	84
Total or average	33	334	364	11,700	72
West 5/	7	11	11	162	5
Grand total or average	58	731	834	22,100	47

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

2/ Values for f.o.b. producing plant.

3/ Includes Maine, New Jersey, New York, North Carolina, and West Virginia.

4/ Includes Illinois, Indiana, Ohio, and Wisconsin.

5/ Includes Iowa, Montana, North Dakota, and Washington.

TABLE 4
U.S. PEAT PRODUCTION AND PRODUCERS' YEAREND STOCKS IN 1999, BY TYPE

Type	Active operations	Production 1/ (metric tons)	Percent of production	Yearend stocks 1/ (metric tons)
Sphagnum moss	8	60,600	8.3	2,650
Hypnum moss	7	41,400	5.7	2,170
Reed-sedge	32	592,000	80.9	263,000
Humus	11	37,500	5.1	4,530
Total	58	731,000	100.0	272,000

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 1999, BY TYPE AND USE 1/

Use	Sphagnum moss			Hypnum moss			Reed-sedge		
	Quantity			Quantity			Quantity		
	Weight (metric tons)	Volume 2/ (cubic meters)	Value (thou- sands)	Weight (metric tons)	Volume (cubic meters)	Value (thou- sands)	Weight (metric tons)	Volume (cubic meters)	Value (thou- sands)
Earthworm culture medium	--	--	--	--	--	--	776	1,260	\$14
General soil improvement	27,300	125,000	1,790	5,990	12,500	471	368,000	636,000	6,820
Golf courses	--	--	--	1,230	2,290	30	18,300	53,500	3,890
Ingredient for potting soils	--	--	--	45,600	77,400	1,510	234,000	391,000	4,600
Mixed fertilizers	--	--	--	--	--	--	24,500	41,300	521
Mushroom beds	1,160	6,590	82	--	--	--	--	--	--
Nurseries	165	1,160	18	5,650	10,300	135	36,100	60,900	801
Packing flowers, plants, shrubs, etc.	2,090	14,700	100	--	--	--	49	92	4
Seed inoculant	--	--	--	--	--	--	13,900	22,900	327
Vegetable growing	--	--	--	1,230	2,290	30	2,270	3,820	48
Other	290	612	14	4,080	7,650	80	4,990	7,650	70
Total	31,000	148,000	2,000	63,800	112,000	2,250	702,000	1,220,000	17,100
	Humus			Total					
	Quantity			Quantity					
	Weight (metric tons)	Volume (cubic meters)	Value (thou- sands)	Weight (metric tons)	Volume (cubic meters)	Value (thou- sands)			
Earthworm culture medium	599	917	\$12	1,380	2,180	\$26			
General soil improvement	8,830	11,700	196	410,000	785,000	9,270			
Golf courses	399	459	5	20,000	56,300	3,920			
Ingredient for potting soils	19,500	16,300	286	299,000	485,000	6,390			
Mixed fertilizers	--	--	--	24,500	41,300	521			
Mushroom beds	165	129	9	1,330	6,720	91			
Nurseries	853	1,060	22	42,800	73,400	976			
Packing flowers, plants, shrubs, etc.	1,180	1,910	23	3,320	16,700	127			
Seed inoculant	--	--	--	13,900	22,900	327			
Vegetable growing	3,010	3,070	44	6,510	9,190	122			
Other	2,230	3,100	143	11,600	19,000	307			
Total	36,800	38,700	739	834,000	1,520,000	22,100			

-- 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 1999 1/

(Kilograms per cubic meter)

	Sphagnum moss	Hypnum moss	Reed- sedge	Humus
Bulk	219	578	597	797
Package	169	475	557	1,055
Bulk and package	210	567	567	951

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

TABLE 7
PRICES FOR PEAT IN 1999 1/

(Dollars per unit)

	Sphagnum moss	Hypnum moss	Reed- sedge	Humus	Average
Domestic:					
Bulk:					
Per metric ton	55.83	31.02	22.73	24.44	25.83
Per cubic meter	12.23	17.93	13.56	19.49	14.02
Packaged or baled:					
Per metric ton	113.80	78.36	25.90	17.87	27.23
Per cubic meter	19.25	37.20	14.43	18.85	15.16
Average:					
Per metric ton	64.51	35.33	24.34	20.07	26.48
Per cubic meter	13.54	20.02	14.02	19.10	14.54
Imported, total, per metric ton 2/	XX	XX	XX	XX	198.72

XX Not applicable.

1/ Prices are f.o.b. plant.

2/ Average customs value.

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

Country	1998		1999	
	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)
Canada	760,000	\$141,000	750,000	\$149,000
Denmark	575	147	575	152
Finland	--	--	284	38
Ireland	205	23	543	71
Netherlands	273	84	125	89
Sri Lanka	26	10	145	30
Other 3/	56 r/	202 r/	116	151
Total	761,000	142,000	752,000	149,000

r/ Revised. -- Zero.

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

2/ Customs value.

3/ Includes Chile, Germany, New Zealand, Norway, Taiwan, and the United Kingdom (1998).

Source: Bureau of the Census.

TABLE 9
PEAT: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country 3/	1995	1996	1997	1998	1999 e/
Argentina: Horticultural use	-- r/	-- r/	-- r/	-- r/	--
Australia e/	15	15	15	15	15
Belarus 4/	2,500 r/	2,793 r/	2,768 r/	2,035 r/	2,000 p/
Burundi	10	10	5 e/	5 e/	5
Canada: Horticultural use	877	901	1,054	1,132 r/	1,306 p/
Denmark: Horticultural use e/	100 r/	204 5/	205	205	200
Estonia: Horticultural and fuel use	952	1,000 e/	1,070	365 r/	923
Finland: e/					
Horticultural use	400	400	400	400	400
Fuel use	8,000	8,000	7,000	6,000 r/	7,000
Total	8,400	8,400	7,400	6,400 r/	7,400
France: Horticultural use e/	200	200	200	200	200
Germany: e/					
Horticultural use	2,800	2,800	2,800	2,800	2,800
Fuel use	180	180	180	180	180
Total	2,980	2,980	2,980	2,980	2,980
Hungary: Horticultural use e/	48 5/	45	45	45	45
Ireland:					
Horticultural use e/	300	300	300	300	300
Fuel use	4,788	6,578	4,351	4,500	5,300
Total e/	5,090	6,880	4,650	4,800	5,600
Latvia: Horticultural and fuel use	455	552	442	172 r/	683 5/
Lithuania: Horticultural and fuel use	214	250 e/	295	195	300
Netherlands e/	-- r/	-- r/	-- r/	-- r/	--
Norway: e/					
Horticultural use	30	30	30	30	30
Fuel use	-- r/	-- r/	-- r/	-- r/	--
Total	30 r/	30 r/	30 r/	30 r/	30
Poland: Horticultural and fuel use	199	198	206 r/	200	200
Russia 4/	4,400	4,100	3,400 r/	1,700 r/	2,000
Spain e/	70	60	60	60	50
Sweden: e/					
Horticultural use	300 r/	300 r/	350 r/	200 r/	250
Fuel use	800	700 r/	1,000 r/	120 r/	800
Total	1,100 r/	1,000 r/	1,350 r/	320 r/	1,050
Ukraine e/ 4/	1,000	1,000	1,000	1,000	1,000
United Kingdom e/	590	550	550	500	500
United States: Horticultural use	648	549	661	685 r/	731 5/
Grand total	29,900 r/	31,700 r/	28,400 r/	23,000 r/	27,200
Of which:					
Horticultural use	5,700 r/	5,730 r/	6,040 r/	6,000	6,260
Fuel use	13,800	15,500	12,500	10,800	13,300
Unspecified	10,400 r/	10,500 r/	9,810 r/	6,250 r/	7,680

e/ Estimated. p/ Preliminary. r/ Revised. -- Zero.

1/ World totals 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 30, 2000.

3/ In addition to the countries listed, Austria, Iceland, and Italy produced negligible amounts of peat.

4/ Production appears to be for fuel use.

5/ Reported figure.