

# PEAT

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Peat is a renewable, natural, organic material of botanical origin and commercial significance. Peatlands are situated predominately in shallow wetlands areas of the Northern Hemisphere, where large deposits developed from the gradual decomposition of plant matter under anerobic or oxygen-free conditions. 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 toxic materials from mine and process waste streams, pathogens from sewage effluents, 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 continued as a significant producer and consumer of peat for horticultural, agricultural, and industrial purposes. A variety of peat types were extracted and processed from more than 56 identified operations in 20 of the contiguous United States and by several operations in Alaska; varieties included, in order of importance, reed-sedge, sphagnum moss, humus, and hypnum moss. About 90% of U.S. production was from the Southeast and the Great Lakes States; Florida, Michigan, and Minnesota ranked as dominant producers. The United States imported more than one-half of its total domestic requirements, principally from Canada, where deposits of sphagnum moss are extensive.

## Production

Domestic production data for peat were developed from a voluntary survey of U.S. operations, except in Alaska, by the U.S. Geological Survey (USGS). Of the 85 operations to which a survey request was sent, 56 responded, representing 95% of the total production. (*See tables 1 and 2.*) Peat production increased 20% compared with that of 1996, according to the annual survey of domestic producers. Despite the increase in 1997, the trend over the past 5 years has been for flat production and consumption, a corresponding drop in the number of domestic producers, and imports from Canada capturing a larger market share.

Geographically, domestic production was dominated by several operations in the Great Lakes region and the Southeast, the major producers were, in order of importance, Florida, Michigan, and Minnesota. (*See tables 2, 3, and 4.*) Peat production in Alaska was estimated at 11,000 cubic meters in 1997, according to the Alaska Department of Natural Resources, which conducts its own survey of mineral production in the State (Swainbank and Clautice, 1998).

## Environment

The Michigan Department of Environmental Quality (MDEQ) approved a permit for Michigan Peat Co. to expand its 385-hectare mining operation in the Minden Bog in Sanilac County. Although MDEQ had been opposed to the expansion, it approved the permit as part of a strategy to protect the bog by allowing the U.S. Environmental Protection Agency, which opposes the expansion, to pursue legal action against the company. This also will minimize any financial risks to State taxpayers that could result from a "takings" claim filed by the company.

The State also added several conditions that Michigan Peat must meet to obtain the permit: (1) establish a 91-hectare buffer strip between peat extraction area and adjacent State or private lands, (2) relocate existing drainage ditches along State property boundaries to outside of the buffer and backfill current drainage ditches, (3) set aside 155 hectares of undisturbed bog within the property, (4) place sediment basins to all outlets to the Black River consistent with National Pollution Discharge Elimination System permit requirements to protect the river's quality, and (5) reclaim the full site to a self-sustaining wetland when production ends (Department of Environmental Quality, State of Michigan, press release, accessed April 15, 1998, at URL <http://www.deq.state.mi.us/pr/970606.html>).

## Consumption

Domestic sales in 1997 increased to 753,000 metric tons, or 57% of total domestic consumption. Packaged materials were 42% of total domestic sale tonnage and commanded premium prices. Imports from Canada supplied 57% of apparent consumption.

Apparent consumption increased 6% from 1996. Nearly 85% of domestic peat was sold for use in general soil improvement, potting soils, and the nursery business, in order of importance. The remainder was used in a variety of applications, including seed inoculants, vegetable cultivation, mixed fertilizers, packing for flowers and plants, and in the industrial sector. (*See tables 3, 5, and 6.*)

## Stocks

U.S. peat stocks increased 23% to 421,000 tons. This represented 117 days of consumption. Reed-sedge peat accounted for 70% of total stocks. (*See table 4.*)

## Prices

The total reported f.o.b. value of domestic peat sold in the United States was \$17.5 million, according to the annual survey of peat producers. The average unit value decreased to \$23.23 per

ton, compared with \$28.90 in 1996. On a unit-value basis, packaged sphagnum moss was valued at \$56.45 per ton f.o.b. plant; hypnum moss, \$64.49 per ton; humus, \$16.10 per ton; and reed-sedge, \$14.98 per ton. (See tables 1, 3, 5, 7, and 8.)

## Foreign Trade

Imports of sphagnum peat moss increased to 754,000 tons in 1997, a 13% increase over that of 1996. The total customs import value was \$133 million or \$176 per ton. Imports of sphagnum moss from Canada reached a record high of 752,000 tons, which represented 89% of total Canadian production. The United States exported 22,000 tons of peat in 1997.

## World Review

According to information available to the USGS, 23 countries were known to produce peat. Estimated production from countries in the former Soviet Union (FSU) account for a significant portion of global peat production, although a continuing decline was believed to be the result of political restructuring and unfavorable economic trends. Because the quantity of peat produced for agricultural purposes in the FSU is not reported on a consistent and reliable basis, worthwhile estimates cannot be made and are not included in table 9.

Peat production outside the FSU was dominated by Ireland, Finland, Germany, Sweden, and Canada, in order of importance. The remainder was produced principally by the United Kingdom and the United States, with minor contributions from countries in Europe, Latin America, and Oceania. More than 50% of reported production was exclusively for fuel use and an additional 5.7 million tons was thought to be for fuel use. (See table 9.)

## Outlook

The outlook for horticulture and associated business is bright because global demand for various plants, flowers, ornamental trees, natural turf, and outdoor recreational activities continue to grow at impressive rates. The U.S. Department of Agriculture anticipates that the growth in monetary value for this industry in the United States will outpace that of traditional agriculture throughout the remainder of the decade. The outlook for domestic peat industry, therefore, will likely be governed by several variables, including future wetlands environmental regulation, 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 ornamentals from offshore.

## Reference Cited

Swainbank, R.C., and Clautice, K.H., 1998, Alaska's mineral industry 1997—A summary: Alaska Department of Natural Resources Information Circular 43, 14 p.

## SOURCES OF INFORMATION

### U.S. Geological Survey Publications

Peat. Ch. in Mineral Commodities Summaries, annual.<sup>1</sup>

Peat. Ch. in Minerals Yearbook, annual.<sup>1</sup>

Peat. Ch. in United States mineral resources, U.S. Geological Survey Professional Paper 820, 1973.

### Other

Peat. Ch. in Mineral facts and problems, U.S. Bureau of Mines Bulletin 675, 1985.

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<sup>1</sup>Prior to January 1996, published by the U.S. Bureau of Mines.

TABLE 1  
SALIENT PEAT STATISTICS 1/

(Thousand metric tons, unless otherwise specified)

	1993	1994	1995	1996	1997	
United States:						
Number of active producers	67	70	64	59	56	
Production	616	574	648 r/	549	661	
Sales by producers	612	552	660	640	753	
Bulk	343	255	339	325	432	
Package	268	297	320	314	320	
Value of sales	thousands	\$16,800	\$15,300	\$17,000	\$18,500	\$17,500
Average per metric ton		\$27.54	\$27.22	\$25.80	\$28.90	\$23.23
Average per metric ton, bulk		\$19.62	\$18.70	\$22.54	\$23.90	\$21.65
Average per metric ton, packaged or baled		\$37.67	\$26.44	\$29.24	\$34.00	\$25.34
Exports	8	23	20	19	22	
Imports for consumption	648	669	669	667	754	
Consumption, apparent 2/	1,300 r/	1,240	1,170 r/	1,240	1,310	
Stocks, December 31: Producers'	269	252	384	342	421	
World: Production	21,500	24,700	24,500 r/	26,200 r/	26,000 e/	

e/ Estimated. r/ Revised.

1/ Data are rounded to three significant digits.

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 in metric tons per year	Active operations		Production (thousand metric tons)	
	1996	1997	1996	1997
23,000 and over	8	10	359	495
9,000 to 22,999	7	5	105	84
5,000 to 8,999	9	7	53	47
2,000 to 4,999	7	5	19	18
1,000 to 1,999	7	5	8	8
Under 1,000	21	24	5	8
Total 1/	59	56	549	661

1/ Data may not add to totals shown because of independent rounding.

TABLE 3  
U.S. PEAT PRODUCTION AND SALES BY PRODUCERS IN 1997, BY STATE 1/

Region and State	Active operations	Production, (thousand metric tons)	Sales		
			Quantity (thousand metric tons)	Value 2/ (thousands)	Percent packaged
<b>Northeast</b>					
Pennsylvania	5	4	3	\$126	10
Other 3/	7	74	74	2,970	30
Total or average	12	78	77	3,100	29
<b>Great Lakes</b>					
Michigan	9	176	176	4,990	89
Minnesota	7	20	29	1,500	56
Other 4/	12	64	76	1,540	80
Total or average	28	260	281	8,040	83
<b>Southeast</b>					
Florida	9	296	361	5,710	10
Other 5/	1	18	18	365	100
Total or average	10	314	379	6,080	14
<b>West</b>					
Washington	2	2	2	62	--
Other 6/	4	6	14	237	68
Total or average	6	8	16	299	60
Grand total or average	56	660	753	17,500	47

1/ Data are rounded to three significant digits; may not add to totals shown.

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

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

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

5/ Includes North Carolina and South Carolina.

6/ Includes Colorado, Iowa, Montana, and North Dakota.

TABLE 4  
U.S. PEAT PRODUCTION AND PRODUCERS' YEAREND STOCKS IN 1997, BY TYPE 1/

Type	Active operations	Production (metric tons)	Percent of production	Yearend stocks (metric tons)
Sphagnum moss	12	178,000	27.0	97,800
Hypnum moss	8	30,300	4.6	1,680
Reed-sedge	23	402,000	60.7	294,000
Humus	13	50,600	7.7	27,200
Total	56 2/	661,000	100.0	421,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Number of active operations includes plants producing multiple kinds of peat.

TABLE 5  
U.S. PEAT SALES BY PRODUCERS IN 1997, BY TYPE AND USE 1/

Use	Sphagnum moss			Hypnum moss			Reed-sedge		
	Quantity			Quantity			Quantity		
	Weight (metric tons)	Volume (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	148	233	\$4	227	382	\$4	998	1,530	\$14
General soil improvement	55,600	156,000	2,580	8,330	16,500	513	269,000	478,000	4,960
Golf courses	5,950	19,100	259	1,360	2,290	28	8,100	18,200	366
Ingredient for potting soils	77,400	128,000	1,680	10,500	18,400	198	141,000	242,000	1,840
Mixed fertilizers	160	917	11	--	--	--	22,700	38,200	475
Mushroom beds	5,340	18,000	235	--	--	--	--	--	--
Nurseries	20,300	77,000	1,080	1,160	3,490	44	39,700	66,600	854
Packing flowers, plants, shrubs, etc.	10,300	38,000	374	--	--	--	--	--	--
Seed inoculant	--	--	--	--	--	--	9,440	21,400	296
Vegetable growing	5,340	18,000	235	1,360	2,290	24	2,350	3,980	51
Other	5,860	21,000	270	--	--	--	191	320	5
Total	186,000	477,000	6,730	22,900	43,400	810	494,000	870,000	8,860
	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	494	688	\$12	1,870	2,830	\$34			
General soil improvement	4,880	7,180	120	338,000	658,000	8,170			
Golf courses	1,510	2,410	44	16,900	41,900	697			
Ingredient for potting soils	5,800	7,200	132	235,000	396,000	3,860			
Mixed fertilizers	850	1,020	21	23,700	40,200	506			
Mushroom beds	--	--	--	5,340	18,000	235			
Nurseries	4,140	5,340	90	65,300	152,000	2,070			
Packing flowers, plants, shrubs, etc.	18,600	77,800	368	29,000	116,000	741			
Seed inoculant	--	--	--	9,440	21,400	296			
Vegetable growing	1,220	1,600	20	10,300	25,900	329			
Other	11,600	14,400	302	17,700	35,700	578			
Total	49,100	118,000	1,110	753,000	1,510,000	17,500			

1/ Data are rounded to 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 1997 1/

(Kilograms per cubic meter)

	Sphagnum moss	Hypnum moss	Reed- sedge	Humus
Bulk	457	550	584	709
Package	249	475	552	359
Bulk and package	391	529	568	418

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

TABLE 7  
PRICES FOR PEAT IN 1997 1/

(Dollars per unit)

	Sphagnum moss	Hypnum moss	Reed- sedge	Humus	Other	Average
Domestic:						
Bulk:						
Per metric ton	22.98	17.07	14.44	24.74	21.60	21.65
Per cubic meter	12.75	11.40	10.25	21.31	15.60	11.57
Packaged or baled:						
Per metric ton	56.45	64.49	14.98	16.10	--	25.34
Per cubic meter	17.04	37.20	10.04	7.02	--	11.61
Average:						
Per metric ton	29.73	29.08	14.71	18.55	21.60	23.23
Per cubic meter	14.11	18.69	10.15	9.42	15.60	11.59
Imported, total, per metric ton 2/	XX	XX	XX	XX	XX	176.22

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	1996		1997	
	Quantity (metric tons)	Value 2/ (thousands)	Quantity (metric tons)	Value 2/ (thousands)
Canada	666,000	\$115,000	752,000	\$132,000
Denmark	362	90	355	87
Ireland	544	64	766	183
Other 3/	441	256	434	439
Total	667,000	116,000	754,000	133,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Customs value.

3/ Includes China, Finland, France, Germany, Mexico, the Netherlands, New Zealand, Norway, and Sweden.

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

(Thousand metric tons)

Country 3/	1993	1994	1995	1996	1997 e/
Argentina: Agricultural use	3	3	4	3 r/	3
Australia e/	11	15	15	15	15
Belarus 4/	350 e/	348	315	279	300
Burundi	10 e/	10	10	10 e/	5
Canada: Agricultural use	801	914	877	901 r/	849 p/
Denmark: Agricultural use (sales)	189	190 e/	205 r/ e/	204 r/	205
Estonia 4/	1,000 e/	1,274	1,083 r/	1,100 r/	1,100
Finland: e/					
Agricultural use	350	550 5/	500	450	450
Fuel use	3,945 5/	5,000	5,000	5,000	5,000
France: Agricultural use e/	200	200	200	200	200
Germany: e/					
Agricultural use	2,739 5/	2,800	2,800	2,800	2,800
Fuel use	180 5/	180	180	180	180
Hungary: Agricultural use e/	65	65	48 5/	45	45
Ireland:					
Agricultural use e/	300	250	300	300	300
Fuel use	3,975	4,696	4,788	7,087	7,000
Latvia 4/	300 e/	647	455	552 r/	442 5/
Lithuania e/ 4/	400	411 5/	214 5/	200	200
Netherlands e/	300	300	300	300	300
Norway: e/					
Agricultural use	30	30	30	30	30
Fuel use	1	1	1	1	1
Poland: Agricultural and fuel use	110	109	199	200 e/	200
Russia 4/	2,500	2,900	3,000 e/	2,500 e/	2,500
Spain e/	70	70	70	60 r/	60
Sweden: e/					
Agricultural use	250	250	250	250	250
Fuel use	1,400	1,400	1,400	1,400	1,400
Ukraine e/ 4/	1,000	1,000	1,000	1,000	1,000
United Kingdom e/	380	500	590	550	550
United States:					
Agricultural use	616	574	648 r/	549	661 5/
Fuel use	W	W	W	W	W
Grand total	21,500	24,700	24,500 r/	26,200 r/	26,000
Of which: Fuel use	9,500	11,300	11,400	13,700	13,600

e/ Estimated. p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; not included in "Total."

1/ World totals, U.S. data, and estimated data are rounded to three significant digits; may not add to totals shown.

2/ Table includes data available through June 25, 1998.

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

4/ Production appears to be for fuel use. This country also produced large unreported quantities for agricultural use.

5/ Reported figure.