PEAT

By David E. Morse

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 anaerobic, 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, and deleterious materials suspended in municipal storm-drain water. In its dehydrated form, peat becomes hydrophobic and 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 was extracted and processed from more than 59 identified operations in 20 of the lower 48 States, and Alaska; varieties included, in order of importance, reed-sedge, sphagnum moss, humus, and hypnum moss. About 90% of U.S. peat production was from the Southeast and Great Lakes States; Florida, Michigan, and Minnesota ranked as the dominant producers. The United States imported about one-half of its total domestic peat requirements, principally from Canada, where deposits of sphagnum peat moss are extensive. A small amount of peat was exported.

Production

Peat production in the United States decreased 9.3% compared with 1995, according to the annual survey of domestic peat producers. This was in line with a long-term trend of declining U.S. peat production, a concomitant drop in the number of domestic operations, relatively flat domestic consumption, overall, and the capture of an important market share by Canadian sphagnum peat moss producers shipping to the United States. Domestic production data for peat production are developed from a voluntary survey of U.S. operations by the U.S. Geological Survey (USGS. Of the the 92 operations to which a survey request was sent, 51 responded, representing 95% of the total production shown in tables 1 and 2, and 34 were idle.

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 according to information reported to the USGS by the industry. About 56% of U.S. production was from operations in the Midwest, the Northeast, and the Western States. Reed-sedge peat accounted for about 77% of domestic production by weight. *(See tables 2, 3, and 4.)*

Consumption

Domestic peat sales volume in 1996 decreased to 640,000 metric tons, or 52% of total U.S. apparent domestic consumption. Packaged materials were 49% of total domestic sales tonnage and commanded premium prices. Canadian exports to the United States continued to supply about one-half of apparent domestic consumption.

About 90% 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, and packing for flowers and plants and in the industrial sector. *(See tables 3, 5, and 6.)*

Stocks

U.S. peat stocks fell by about 11%, to 340,000 tons, and represented nearly 100 days of consumption. Reed-sedge peat was 85% of total stocks. *(See table 4.)*

Prices

The total reported f.o.b. plant value of domestic peat sold in the United States was $18.5 million, according to the annual survey of peat producers. The total sales value of domestic peat increased compared with 1995 in spite of a decline in sales volume; the average unit value increased to $28.88 per ton, compared with $25.80 in 1995. On a unit-value basis, packaged sphagnum moss was valued at nearly $87 per ton, f.o.b plant; hypnum moss, $78 per ton; humus, $20 per ton; and, reed-sedge, $29 per ton. *(See tables 1, 3, 5, 7, and 8.)*

Foreign Trade

The United States continued to export minor tonnages of peat, which amounted to 19,000 tons, according to reports issued by the Bureau of the Census. U.S. peat exports were valued at $1.99 million, or about $104 per ton, f.a.s. *(See table 8.)*

Canadian sphagnum moss import volume of 665,000 tons in 1996 carried a customs value of $115 million, or $173 per ton. Imports from other countries were less than 2,000 tons.

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. The quantity of peat produced for agriculture in the FSU was, therefore, not estimated and is not included in world production tabulations, even though the quantity produced is thought to be significant. 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. *(See table 9.)*

Outlook

The outlook for horticulture and associated businesses is bright because global demand for various plants, flowers, ornamental trees, natural turf, and outdoor recreational activities continues 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 the 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.

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, U.S. Geological Survey Professional Paper 820, 1973.

Other

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

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

TABLE 1
SALIENT PEAT STATISTICS 1/

		1992	1993	1994	1995	1996
United States:						
Number of active producers		71	67	70	64	59
Production	thousand metric tons	599	616	574	589 r/	549
Sales by producers	do.	652	612	552	660	640
Bulk	do.	288	343	255	339	325
Package	do.	365	268	297	320	314
Value of sales	thousands	$16,700	$16,800	$15,300	$17,000	$18,500
Average per metric ton		$25.70	$27.50	$27.20	$25.80	$28.90
Average per metric ton, bulk		$19.30	$19.60	$18.70	$22.50	$23.90
Average per metric ton, packaged or baled		$30.70	$37.70	$26.40	$29.20	$34.00
Exports	thousand metric tons	22	8	23	20 r/	19
Imports for consumption	do.	639	648	669	669	667
Consumption, apparent 2/	do.	1,230	1,290	1,240	1,110 r/	1,240
Stocks, December 31: Producers'	do.	308	269	252	384	342
World: Production	do.	29,300 r/	21,500 r/	24,700 r/	24,300 r/	25,800 e/

e/ Estimated. r/ Revised.

1/ Data are rounded to three significant digits; except prices.

2/ Apparent consumption equals U.S. primary production plus imports minus exports plus adjustments for industry stock changes.

TABLE 2
RELATIVE SIZE OF PEAT OPERATIONS IN THE UNITED STATES 1/

	Active operations		Production (thousand metric tons)	
Size in metric tons per year	1995	1996	1995	1996
23,000 and over	10	8	405	359
9,000 to 22,999	6	7	88	105
5,000 to 8,999	10	9	61	53
2,000 to 4,999	9	7	22	19
1,000 to 1,999	7	7	8	8
Under 1,000	22	21	5	5
Total	64	59	589 r/	549

r/ Revised.

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

TABLE 3
U.S. PEAT PRODUCTION AND SALES BY PRODUCERS IN 1996, BY STATE 1/

		Production	Sales		
Region and State	Active operations	Quantity (thousand metric tons)	Quantity (thousand metric tons)	Value 2/ (thousands)	Percent packaged
Northeast					
Pennsylvania	6	5	4	$166	7
Other 3/	7	40	40	1,600	88
Total	13	45	44	1,770	90
Great Lakes					
Michigan	9	171	168	4,650	92
Minnesota	7	19	20	1,540	56
Other 4/	12	64	69	4,250	92
Total	28	254	257	10,400	89
Southeast					
Florida	9	224	298	5,550	12
Other 5/	1	15	15	311	100
Total	10	239	313	5,860	15
West					
Washington	2	2	2	68	--
Other 6/	6	9	24	345	78
Total	8	11	26	413	38
Total or average	59	549	640	18,500	49

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 1996, BY KIND 1/

Kind	Active operations	Production (metric tons)	Percent of production	Yearend stocks (metric tons)
Sphagnum moss	11	46,500	8.5	18,500
Hypnum moss	7	29,400	5.4	1,220
Reed-sedge	28	423,000	76.9	291,000
Humus	16	50,400	9.2	32,200
Total	59 2/	549,000	100	342,000

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 1996, BY TYPE AND USE 1/

	Sphagnum moss			Hypnum moss			Reed-sedge		
	Quantity			Quantity			Quantity		
Use	Weight (metric tons)	Volume 2/ (cubic yards)	Value (thousands)	Weight (metric tons)	Volume (cubic yards)	Value (thousands)	Weight (metric tons)	Volume (cubic yards)	Value (thousands)
Earthworm culture medium	--	--	--	227	500	$4	1,200	2,640	$26
General soil improvement	24,400	130,000	$1,960	8,330	21,600	513	294,000	681,000	5,380
Golf courses	1,830	8,120	97	1,360	3,000	28	6,890	24,400	386
Ingredient for potting soils	1,940	9,220	106	10,500	24,100	198	162,000	362,000	3,040
Mixed fertilizers	--	--	--	--	--	--	22,700	50,000	475
Mushroom beds	--	--	--	--	--	--	--	--	--
Nurseries	16,100	95,900	1,210	1,160	4,570	44	29,800	87,200	887
Packing flowers, plants, shrubs, etc.	2,830	26,000	135	--	--	--	--	--	--
Seed inoculant	--	--	--	--	--	--	5,510	12,200	2,840
Vegetable growing	--	--	--	1,360	3,000	24	2,350	5,200	51
Other	1,830	8,140	97	--	--	--	--	--	--
Total	48,900	278,000	3,610	22,900	56,700	810	525,000	1,220,000	13,100

	Humus			Total		
	Quantity			Quantity		
	Weight (metric tons)	Volume (cubic yards)	Value (thousands)	Weight (metric tons)	Volume (cubic yards)	Value (thousands)
Earthworm culture medium	200	450	$6	1,630	3,590	$36
General soil improvement	14,600	23,900	292	342,000	856,000	8,150
Golf courses	1,330	3,100	45	11,400	38,600	556
Ingredient for potting soils	9,870	15,700	211	185,000	411,000	3,550
Mixed fertilizers	1,010	1,590	24	23,700	51,600	499
Mushroom beds	196	300	4	196	300	4
Nurseries	1,430	3,060	44	48,400	191,000	2,190
Packing flowers, plants, shrubs, etc.	272	500	3	3,100	26,500	138
Seed inoculant	--	--	--	5,510	12,200	2,840
Vegetable growing	1,150	2,530	31	4,860	10,700	105
Other	12,800	20,700	323	14,600	28,800	420
Total	42,900	71,900	982	640,000	1,630,000	18,500

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 1996 1/ 2/

(Kilograms per cubic meter)

	Sphagnum moss	Hypnum moss	Reed-sedge	Humus
Bulk	285	550	564	624
Package	205	475	558	827
Bulk and package	231	529	561	780

1/ Data are rounded to three significant digits.
2/ To convert kilograms per cubic meter to pounds per cubic yard multiply by 1.685.

TABLE 7
PRICES 1/ FOR PEAT IN 1996

(Dollars per unit)

	Sphagnum moss	Hypnum moss	Reed-sedge	Humus	Average
Domestic:					
Bulk:					
Per metric ton	54.21	20.74	21.62	36.58	23.90
Per cubic yard	11.83	8.72	9.33	17.58	9.75
Packaged or baled:					
Per metric ton	86.53	78.36	28.68	19.68	34.02
Per cubic yard	13.54	28.44	12.24	12.45	12.86
Average:					
Per metric ton	73.66	35.34	24.91	22.89	28.88
Per cubic yard	12.99	14.29	10.69	13.66	11.34
Imported, total, per metric ton 2/	XX	XX	XX	XX	--

XX Not applicable.
1/ Prices are f.o.b. plant.
2/ Average customs value.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF PEAT MOSS, 1/ 2/
BY COUNTRY

	1995		1996	
Country	Quantity (metric tons)	Value 3/ (thousands)	Quantity (metric tons)	Value 3/ (thousands)
Canada	667,000	$121,000	666,000	$115,000
Denmark	17	9	362	90
Ireland	1,030	88	544	64
Other 4/	600 r/	284 r/	441	256
Total	669,000	121,000	667,000	116,000

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Poultry and fertilizer grade.
3/ Customs value.
4/ Includes Germany, the Netherlands, New Zealand, Norway, Sri Lanka, and the United Kingdom.

Source: Bureau of the Census.

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

(Thousand metric tons)

Country 3/	1992	1993	1994	1995	1996 e/
Argentina: Agricultural use	1	3 r/	3 r/	4 r/	4
Australia e/ 4/	11	11	15	15	15
Belarus e/ 5/	350	350	348 6/	315 6/	279 6/
Burundi	12	10 e/	10	10 r/	10
Canada: Agricultural use	740	801	914	877 r/	783 p/
Denmark: Agricultural use (sales)	195	189	190 e/	190 e/	185
Estonia e/ 5/	1,000	1,000	1,274 6/	952 6/	950
Finland:					
Agricultural use	355	350 e/	550	500 e/	450
Fuel use	5,103	3,945	5,000 e/	5,000 e/	5,000
France: Agricultural use e/	200	200	200	200	200
Germany:					
Agricultural use	2,718	2,739	2,800 e/	2,800 e/	2,800
Fuel use	188	180	180 e/	180 e/	180
Hungary: Agricultural use e/	65	65	65	48 r/ 6/	45
Ireland:					
Agricultural use e/	300	300	250	300	300
Fuel use	5,414 r/	3,975 r/	4,696 r/	4,788 r/	7,087 6/
Latvia e/ 5/	300	300	647 6/	455 r/ 6/	463 6/
Lithuania e/ 5/	400	400	411 6/	214 6/	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	134	110 r/	109 r/	199 r/	200
Russia 5/	7,800	2,500	2,900	3,000 e/	2,500
Spain e/	70	70	70	70	70
Sweden: e/					
Agricultural use	260	250	250	250	250
Fuel use	1,400	1,400	1,400	1,400	1,400
Ukraine e/ 5/	1,000	1,000	1,000	1,000	1,000
United Kingdom e/	390	380	500	590	550
United States:					
Agricultural use	599	616	574	589 r/	549 6/
Fuel use	W	W	W	W	W
Grand total	29,300 r/	21,500 r/	24,700 r/	24,300 r/	25,800
Of which: Fuel use	12,100 r/	9,500 r/	11,300 r/	11,400 r/	13,700

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, 1997.

3/ In addition to the countries listed, Austria, Iceland, and Italy produced negligible amounts of fuel peat; Venezuela was a major producer, but output was not officially reported and available information was inadequate for formulation of estimates of output levels.

4/ Excludes data from some States.

5/ The majority of production appears to be for fuel use. This country also produced unreported quantities for agricultural use.

6/ Reported figure.