

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.

References Cited

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GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

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

Other

- Global Peat Resources. International Peat Society, 1996.
Peat. Ch. in Mineral Facts and Problems, U.S. Bureau of Mines Bulletin 675, 1985.
Peat Industry Review 2003. New Brunswick Department of Natural Resources and Energy, 2004.
Peat News. International Peat Society, monthly.
Peatlands International. International Peat Society, semiannual.

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

TABLE 1
SALIENT PEAT STATISTICS¹

(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 |
| 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 ¹ | 272 | 279 | 257 | 207 | 180 |
| World, production | 27,000 ^r | 24,700 ^r | 25,700 ^r | 27,400 ^r | 26,100 ^e |

^eEstimated. ^rRevised.

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

²Exclusive of Alaska.

³Apparent 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) | |
|--------------------------------|-------------------|------|--------------------------------------|------|
| | 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 STATE¹

| Region and State | Active operations | Production (thousand metric tons) | Sales | | |
|------------------------|-------------------|-----------------------------------|---------------------------------|--------------------------------|---------------------|
| | | | 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.

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

²Values for free on board producing plant.

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

⁴Includes Illinois, Indiana, Ohio, and Wisconsin.

⁵Includes 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 |

¹Data 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 USE¹

| Use | Sphagnum moss | | | Hypnum moss | | | Reed-sedge | | |
|---------------------------------------|----------------------------|--|----------------------|----------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|----------------------|
| | Quantity | | Value (thousands) | Quantity | | Value (thousands) | Quantity | | Value (thousands) |
| | Weight (metric tons) | Volume ² (cubic meters) | | Weight (metric tons) | Volume (cubic meters) | | Weight (metric tons) | Volume (cubic meters) | |
| 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 |

| Use | Humus | | | Total | | |
|---------------------------------------|----------------------------|-----------------------------|----------------------|----------------------------|-----------------------------|----------------------|
| | Quantity | | Value (thousands) | Quantity | | Value (thousands) |
| | Weight (metric tons) | Volume (cubic meters) | | Weight (metric tons) | Volume (cubic meters) | |
| 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.

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

²Volume 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 |

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

TABLE 7
PRICES FOR PEAT IN 2003¹

(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.

¹Prices are free on board plant.

²Average customs value.

TABLE 8

U.S. IMPORTS FOR CONSUMPTION OF PEAT MOSS, BY COUNTRY¹

| Country | 2002 | | 2003 | |
|--------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|
| | 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 |

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

²Customs value.

³Includes 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 ^c |
|--|---------------------|---------------------|---------------------|---------------------|--------------------|
| 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, horticultural 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 |

^eEstimated. ^rRevised. --Zero.

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

²Table includes data available through June 25, 2004.

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

⁴Reported figure.

⁵Fiscal year data.