

2011 Minerals Yearbook

PEAT [ADVANCE RELEASE]

PEAT

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In 2011, peat produced in the conterminous United States was 568,000 metric tons (t); output from Alaska was estimated to be 61,500 cubic meters (L.A., Harbo, mineral specialist, Alaska Office of Economic Development, oral c ommun., September 5, 2012). World peat production for 2011 was estimated to be 26.3 million metric tons (Mt). The leading peat-producing countries were Finland, Ireland, Germany, Belarus, Sweden, Russia, Canada, and Latvia, in decreasing order of tonnage (table 9).

The United States was a significant producer and consumer of peat for horticultural and industrial purposes. The types of peat are classified according to the degree of decomposed component plant material, with sphagnum moss being the least decomposed followed by hypnum moss, reed-sedge, and humus.

Reed-sedge accounted for 85% of domestic peat production, followed by sphagnum moss with 10%; hypnum moss with 4%; and humus with 1% (table 4). Florida, with 449,000 t, accounted for 79% of U.S. peat production (table 3).

Peat is a natural organic material of botanical origin and commercial significance. Peatlands are situated in wetland areas, primarily in the temperate and cold belt of the Northern Hemisphere, where large peat 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. 55). There are more than 400 million hectares (Mha) of peatlands on Earth, of which 80% remains undisturbed. Of the 80 Mha that have 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 55% of global peatlands; however, the volume of global peat resources has been decreasing at a rate of 0.05% per year owing to human activity (Joosten and Clarke, 2002, p. 32–33).

Production

Domestic production data for peat were developed by the U.S. Geological Survey from a voluntary canvass of operations in the conterminous United States. Of the 39 operations to which a survey request was sent, 33 responded. Of the respondents, 29 were active operations, 3 were idle, and 1 closed in 2011. Data for nonrespondents were estimated based on responses to the 2010 survey or other sources. Most peat operations are relatively small (producing less than 5,000 metric tons per year) and sell their products regionally. Peat production in the conterminous United States in 2011 was 568,000 t, about a 10% decrease from that of 2010 (table 1). In 2011, 74% of domestic production came from just five operations (table 2). In all regions of the United States, peat production was reported to have decreased (table 3). Output from Alaska was estimated to be 61,500 cubic meters in 2011, according to the Alaska Department

of Natural Resources, which conducted its own survey of mineral production in the State (L.A., Harbo, mineral specialist, Alaska Office of Economic Development, oral commun., September 5, 2012). Peat production in Alaska was reported by volume only.

Consumption

Peat is widely used as a plant-growth medium in a variety of agricultural and horticultural applications where its fibrous structure and porosity enable a unique combination of optimum water-retention and drainage characteristics. Commercial applications include lawn and garden soil amendments, potting soils, 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.

Sales of domestic peat decreased slightly to 595,000 t in 2011 from 605,000 t in 2010. Packaged products composed 11% of total domestic sales tonnage and commanded premium prices for all grades of peat. Apparent consumption was estimated to be 3% lower than that of 2010. Potting soil and general soil improvement mixes were the two leading usage categories, accounting for 72% of domestic sales tonnage and 70% of the volume (table 5). Other significant uses, by quantity of sales, included golf course applications, nursery applications, and seed inoculants. The United States imported 65% of its total consumption 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 was packaged for horticultural use; however, a detailed distribution of Canadian imports was not available. Many of the soil blending facilities in the southern and western United States are owned by subsidiaries of Canadian peat producers and import much of their peat requirements.

Stocks

U.S. yearend stocks of peat increased by 33% to 133,000 t in 2011 from 100,000 t in 2010 (table 1). Reed-sedge peat accounted for 66% of total stocks, followed by sphagnum moss, hypnum moss, and humus (table 4).

Prices

The total reported free on board (f.o.b.) value for domestic peat sold in the United States was about \$14 million, according to the annual survey of domestic peat producers. The average unit value decreased by 7% to \$22.73 per metric ton compared with \$24.39 per ton in 2010 (table 1). On an average unit-value

basis, sphagnum moss was valued at \$52.59 per ton, f.o.b. plant; hypnum moss, \$33.56 per ton; humus, \$21.04 per ton; and reed-sedge, \$19.92 per ton (table 7).

Foreign Trade

U.S. companies exported 49,000 t of peat (table 1). Imports of peat increased by about 4% to 982,000 t from 947,000 t in 2010 (tables 1 and 8). The total customs import value was \$228 million or \$231.82 per ton. Imports of peat (sphagnum moss) from Canada increased to 954,000 t, which represented 97% of total United States imports and 85% of total Canadian production.

World Review

Finland, Ireland, Germany, Belarus, Sweden, Russia, Canada, and Latvia were the leading peat-producing countries, in decreasing order of tonnage (table 9). World peat production for 2011 was estimated to be 26.3 Mt, slightly higher than that of 2010. Other significant producing countries included Estonia, Poland, and the United States. Peat is an important source of energy in Finland, Ireland, and Sweden and to a lesser extent in Eastern Europe.

Canada.—Production of peat (sphagnum moss) was estimated to have decreased to 1.12 Mt in 2011 from 1.26 Mt in 2010. New Brunswick, Quebec, Manitoba, and Alberta were the major producing provinces, in decreasing order of tonnage, accounting for about 95% of production. British Columbia, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan also reported peat production (Natural Resources Canada, 2012). Heavy rainfall during the summer resulted in the decrease of peat harvesting in eastern Canada.

The Government of Canada granted the Québec Peat Moss Producers Association (APTHQ) about CAN\$250,000 to implement a project aimed at developing and testing rehabilitation and restoration techniques for peatlands at the end of production. APTHQ would spend 2 years collaborating with eight sphagnum peat moss producers to develop techniques for restoring and rehabilitating peatlands (Québec Peat Moss Producers Association, 2011).

Russia.—In July, the Russian and German Governments agreed to the Russian peatland restoration project (PeatRus). This project had financing through Germany's International Climate Initiative and the political backing of the Russian Government. The goal of the project was to reflood 35,000 hectares of dried-out peat bogs and reduce carbon dioxide emissions from them (Pearce, 2011).

Outlook

The domestic short-term peat situation will likely include steadily increasing Canadian imports and fluctuating domestic peat production. The number of domestic producers likely will continue to decline and remain dominated by large companies. Other factors, such as competition from organic soil amendments like coir (coconut fiber) and composted yard waste, Federal and State wetlands regulations, and restrictions on permitting new production sites likely will reduce or slow the growth of the domestic peat industry. Also, peatlands have been identified as carbon sinks, storing more carbon dioxide per unit hectare than any other ecosystem. Preservation of peatlands may become a high priority in the efforts to reduce greenhouse gas emissions.

References Cited

- Joosten, Hans, and Clarke, Donal, 2002, Wise use of mires and peatlands: Jyvaskyla, Finland, International Peat Society, 304 p.
- Lappalainen, Eino, 1996, Global peat resources: Jyvaskyla, Finland, International Peat Society, 368 p.
- Natural Resources Canada, 2012, Preliminary estimate of the mineral production of Canada, by Province, 2011: Natural Resources Canada, August, 6 p. (Accessed August 20, 2012, at http://mmsd.mms.nrcan.gc.ca/stat-stat/ prod-prod/ann-ann-eng.aspx.)
- Pearce, Fred, 2011, The big payback from bringing back peat bogs: Yale Environment 360, September 26. (Accessed September 7, 2012, at http:// e360.yale.edu/feature/the_big_payback_from_bringing_back_peat_ bogs_/2445/.)
- Québec Peat Moss Association, 2011, Government of Canada grants \$248,920 to the Québec Peat Moss Producers Association: Québec Peat Moss Association industry news, January 31, 1 p. (Accessed September 9, 2012, at http://www.tourbehorticole.com/en/news/details.php?id=241.)

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

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

Other

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

Peat Industry Review 2008. New Brunswick Department of Natural Resources, Minerals & Petroleum Development Branch.

Peatlands International. International Peat Society, semiannual. Peat News. International Peat Society, monthly.

TABLE 1 SALIENT PEAT STATISTICS¹

(Thousand metric tons and thousand dollars unless otherwise specified)

| | 2007 | 2008 | 2009 | 2010 | 2011 |
|--------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| United States: ² | | | | | |
| Number of active producers | 38 | 37 | 38 | 37 ^r | 36 |
| Production | 635 | 615 | 609 | 628 | 568 |
| Sales by producers: | | | | | |
| Quantity: | | | | | |
| Bulk | 590 | 546 | 559 | 554 | 535 |
| Packaged | 104 | 102 | 85 | 51 | 60 |
| Total | 694 | 647 | 644 | 605 | 595 |
| Value | 17,700 | 17,100 | 15,000 | 14,800 | 13,500 |
| Average value dollars per metric ton | 25.59 | 26.42 | 23.24 | 24.39 | 22.73 |
| Average value, bulk do. | 24.69 | 24.73 | 22.06 | 24.28 | 22.12 |
| Average value, packaged or baled do. | 30.64 | 36.24 | 31.01 | 26.48 | 28.14 |
| Exports | 56 | 57 ³ | 77 | 69 | 49 |
| Imports for consumption | 977 | 936 | 906 | 947 | 982 |
| Consumption, apparent ⁴ | 1,590 | 1,440 | 1,440 | 1,560 | 1,500 |
| Stocks, December 31, producers' | 98 | 152 | 149 | 100 | 133 |
| World, production | 31,500 ^r | 28,200 ^r | 25,900 ^r | 25,700 ^r | 26,300 ^e |

^eEstimated. ^rRevised. do. Ditto.

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

²Excludes Alaska.

³Source: U.S. Census Bureau; data adjusted by the U.S. Geological Survey.

⁴Apparent consumption equals U.S. production plus imports minus exports plus adjustments for industry stock changes.

| | | | Production | | |
|------------------------|------------------|--------|----------------------|-----|--|
| Size | Active operation | ations | (thousand metric ton | | |
| (metric tons per year) | 2010 | 2011 | 11 2010 2 | | |
| 23,000 and more | 6 | 5 | 495 | 420 | |
| 9,000 to 22,999 | 6 | 6 | 85 | 93 | |
| 5,000 to 8,999 | 4 | 5 | 25 | 35 | |
| 1,000 to 4,999 | 7 | 6 | 17 | 15 | |
| Less than 1,000 | 14 ^r | 14 | 7 | 4 | |
| Total | 37 ^r | 36 | 628 | 568 | |

 TABLE 2

 RELATIVE SIZE OF PEAT OPERATIONS IN THE UNITED STATES¹

^rRevised.

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

TABLE 3 U.S. PEAT PRODUCTION AND SALES BY PRODUCERS IN 2011, BY STATE¹

| | | | | Sales | | |
|------------------------|------------|---------------|---------------|--------------------|------------|--|
| | Active | Production | Quantity | Value ² | Percentage | |
| Region and State | operations | (metric tons) | (metric tons) | (thousands) | packaged | |
| East: | | | | | | |
| Florida | 7 | 449,000 | 494,000 | \$9,370 | 3 | |
| Other ³ | 9 | 24,900 | 20,600 | 1,130 | 39 | |
| Total or average | 16 | 474,000 | 515,000 | 10,500 | 3 | |
| Great Lakes: | | | | | | |
| Minnesota | 9 | 59,000 | 44,200 | 2,490 | 47 | |
| Other ⁴ | 8 | 33,200 | 34,500 | 479 | 72 | |
| Total or average | 17 | 92,100 | 78,700 | 2,970 | 58 | |
| West ⁵ | 3 | 1,130 | 1,500 | 58 | | |
| Grand total or average | 36 | 568,000 | 595,000 | 13,500 | 11 | |

-- 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 Pennsylania.

⁴Includes Illinois, Indiana, Michigan, and Ohio.

⁵Includes Iowa, Washington, and Wisconsin.

TABLE 4 U.S. PEAT PRODUCTION AND PRODUCERS' YEAREND STOCKS IN 2011, BY TYPE

| | | | | Yearend |
|--------------------|-------------------------|-------------------------|---------------|---------------------|
| | Active | Production ² | Percentage of | stocks ² |
| Туре | operations ¹ | (metric tons) | production | (metric tons) |
| Sphagnum moss | 9 | 54,400 | 10 | 23,300 |
| Hypnum moss | 4 | 21,200 | 4 | 16,300 |
| Reed-sedge | 17 | 484,000 | 85 | 87,900 |
| Humus | 6 | 8,120 | 1 | 5,760 |
| Total ³ | 36 | 568,000 | 100 | 133,000 |

¹Some plants produce multiple types of peat.

²Data are rounded to no more than three significant digits.

³May not add to totals shown.

TABLE 5 U.S. PEAT SALES BY PRODUCERS IN 2011 BY TYPE AND USE $^{\rm 1}$

| | | Sphagnum me | OSS | | Hypnum mos | S |
|---------------------------------------|-------------------|-------------------------------|-------------|-------------------|--------------------|-------------|
| | Quantity | | | Qua | ntity | |
| | Weight (metric | Volume ² (cubic | Value | Weight (metric | Volume (cubic | Value |
| Use | tons) | meters) | (thousands) | tons) | meters) | (thousands) |
| Earthworm culture medium | | | | W | W | W |
| General soil improvement | 27,800 | 204,000 | \$1,270 | 2,190 | 4,400 | \$76 |
| Golf courses | W | W | W | | | |
| Ingredient for potting soils | 4,170 | 17,000 | 307 | W | W | W |
| Mixed fertilizers | | | | W | W | W |
| Nurseries | W | W | W | 32 | 100 | 2 |
| Packing flowers, plants, shrubs, etc. | | | | | | |
| Seed inoculant | | | | | | |
| Vegetable growing | | | | | | |
| Other | W | W | W | | | |
| Total | 48,800 | 332,000 | 2,560 | 5,130 | 10,000 | 172 |
| | _ | Reed-sedge | 2 | | Total ³ | |
| | Qua | Quantity Quantity | | ntity | | |
| | Weight | Volume | | Weight | Volume | |
| | (metric | (cubic | Value | (metric | (cubic | Value |
| | tons) | meters) | (thousands) | tons) | meters) | (thousands) |
| Earthworm culture medium | W | W | W | W | W | W |
| General soil improvement | 55,800 | 126,000 | \$763 | 85,800 | 334,000 | \$2,110 |
| Golf courses | 6,070 | 28,100 | 585 | 6,070 | 28,100 | 585 |
| Ingredient for potting soils | 335,000 | 749,000 | 6,230 | 342,000 | 772,000 | 6,670 |
| Mixed fertilizers | W | W | W | W | W | W |
| Nurseries | 3,680 | 17,400 | W | 3,710 | 17,500 | W |
| Packing flowers, plants, shrubs, etc. | | | | W | W | W |
| Seed inoculant | W | W | W | 2,680 | W | 55 |
| Vegetable growing | W | W | W | W | W | W |
| Other | | | | W | W | W |
| Total | 534,000 | 1,220,000 | 10,400 | 595,000 | 1,570,000 | 13,500 |

W Withheld to avoid disclosing company proprietary data; included in "Total." -- 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.

³Total includes humus; individual data withheld to avoid disclosing company proprietary data.

TABLE 6

AVERAGE DENSITY OF DOMESTIC PEAT SOLD IN 2011

(Kilograms per cubic meter)¹

| | Sphagnum | Hypnum | Reed- | |
|-------------------|----------|--------|-------|-------|
| | moss | moss | sedge | Humus |
| Bulk | 241 | 670 | 573 | 776 |
| Packaged | 146 | | 583 | 736 |
| Bulk and packaged | 192 | 670 | 574 | 770 |

-- Zero.

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

TABLE 7PRICES FOR PEAT IN 20111

(Dollars per unit)

| | Sphagnum moss | Hypnum moss | Reed- sedge | Humus | Average |
|--|------------------|----------------|----------------|-------|---------|
| Domestic: | | | | | |
| Bulk: | | | | | |
| Per metric ton | 48.08 | 33.56 | 20.50 | 17.68 | 22.12 |
| Per cubic meter | 11.56 | 22.50 | 11.75 | 13.72 | 11.83 |
| Packaged or baled: | | | | | |
| Per metric ton | 59.63 | | 12.76 | 39.35 | 28.14 |
| Per cubic meter | 8.69 | | 7.43 | 28.98 | 8.43 |
| Average: | | | | | |
| Per metric ton | 52.59 | 33.56 | 19.92 | 21.04 | 22.73 |
| Per cubic meter | 10.09 | 22.50 | 11.44 | 16.19 | 11.26 |
| Imported, total, per metric ton ² | XX | XX | XX | XX | 231.82 |

XX Not applicable. -- Zero.

¹Prices are free on board plant.

²Average customs value.

| TABLE 8 |
|---|
| U.S. IMPORTS FOR CONSUMPTION OF PEAT, BY COUNTRY ¹ |

| | 20 | 10 | 20 | 11 |
|----------------|---------------|----------------------|---------------|--------------------|
| | Quantity | Value ² | Quantity | Value ² |
| Country | (metric tons) | (thousands) | (metric tons) | (thousands) |
| Belgium | 911 | \$208 ^r | 120 | \$10 |
| Canada | 921,000 | 215,000 ^r | 954,000 | 219,000 |
| Chile | 142 | 103 ^r | 22 | 70 |
| Estonia | 1,570 | 387 ^r | 5,340 | 1,370 |
| Finland | 469 | 175 ^r | 265 | 113 |
| Germany | 439 | 100 ^r | 571 | 133 |
| India | 431 | 157 | 170 | 93 |
| Ireland | 1,900 | 565 ^r | 1,330 | 440 |
| Latvia | 16,800 | 5,570 ^r | 16,700 | 4,970 |
| Lithuania | 158 | 34 ^r | 303 | 70 |
| Netherlands | 1,380 | 409 ^r | 1,160 | 522 |
| New Zealand | 138 | 49 ^r | 1,120 | 65 |
| Norway | 361 | 1,630 ^r | | |
| Sweden | 1,220 | 467 ^r | 1,040 | 390 |
| United Kingdom | 190 | 76 ^r | | |
| Other | 196 | 149 ^r | 176 | 100 |
| Total | 947,000 | 225,000 | 982,000 | 228,000 |

^rRevised. -- Zero.

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

²Customs value.

Source: U.S. Census Bureau.

TABLE 9 PEAT: WORLD PRODUCTION, BY COUNTRY^{1, 2}

(Thousand metric tons)

| Country ³ | 2007 | 2008 | 2009 | 2010 | 2011 ^e |
|---|---------------------|---------------------|---------------------|---------------------|-----------------------|
| Argentina, horticultural use | 14 | 12 ^r | 8 ^r | 6 ^r | 7 |
| Australia ^e | 7 | 7 | 7 | 7 | 7 |
| Belarus: | | | | | |
| Horticultural use | 318 ^{r, e} | 395 ^{r, e} | 272 | 242 | 230 |
| Fuel use | 2,502 ^r | 2,361 ^r | 2,216 | 2,352 | 2,500 |
| Total | 2,820 ^r | 2,756 ^r | 2,488 | 2,593 | 2,730 |
| Burundi, fuel use | 7 | 10 | 11 | 13 ^r | 15 |
| Canada, horticultural use | 1,282 | 1,151 | 1,131 | 1,262 | 1,122 ^{p, 4} |
| Denmark, horticultural use ^e | 213 4 | 128 | 128 | 128 | 128 |
| Estonia: | | | | | |
| Horticultural use | 964 | 705 | 110 | 361 | 360 |
| Fuel use | 475 | 213 | 419 | 604 | 600 |
| Total | 1,439 | 919 | 529 | 965 | 960 |
| Finland: | | | | | |
| Horticultural use | 8,671 | 6,933 | 5,576 | 5,580 ° | 5,580 |
| Fuel use | 1,145 | 1,552 | 876 | 880 ^e | 880 |
| Total | 9,816 | 8,485 | 6,452 | 6,460 ^e | 6,460 |
| France, horticultural use ^e | 200 | 200 | 200 | 200 | 200 |
| Germany, horticultural use | 3,064 ^r | 2,826 ^r | 3,085 ^r | 2,868 ^r | 2,934 4 |
| Hungary, horticultural use ^e | 90 | 90 | 90 | 107^{-4} | 100 |
| Ireland: ⁵ | | | | | |
| Horticultural use ^e | 500 | 500 | 500 | 500 | 500 |
| Fuel use | 2,700 | 3,000 | 2,800 | 2,800 e | 2,800 |
| Total | 3,200 | 3,500 | 3,300 | 3,300 ^e | 3,300 |
| Latvia, horticultural and fuel uses | 1,000 ^e | 1,000 | 1,164 | 694 ^r | 1,120 |
| Lithuania, horticultural and fuel uses | 307 | 521 | 543 | 327 | 326 |
| Moldova, fuel use ^e | 475 | 475 | 475 | 475 | 475 |
| New Zealand, horticultural use ^e | 27 | 27 | 26 | 26 | 26 |
| Norway, horticultural use | 140 | 438 | 440 ^e | 440 ^e | 425 |
| Poland, horticultural and fuel uses | 641 | 632 | 594 | 672 | 670 |
| Russia, horticultural and fuel uses | 1,300 | 1,300 | 1,300 e | 1,300 e | 1,650 |
| Spain ^e | 60 | 60 | 60 | 60 | 60 |
| Sweden: ^e | | | | | |
| Horticultural use | 1,500 | 1,130 | 1,230 | 1,230 | 1,230 |
| Fuel use | 2,640 | 1,320 | 1,320 | 1,320 | 1,320 |
| Total | 4,140 | 2,450 | 2,550 | 2,550 | 2,550 |
| Ukraine, horticultural and fuel uses | 595 ^r | 558 ^r | 691 | 597 ^e | 454 ⁴ |
| United Kingdom | 1 | 1 ^r | 1 ^r | 1 | 1 |
| United States, horticultural use | 635 | 615 | 609 | 628 | 568 ⁴ |
| Grand total | 31,500 ^r | 28,200 ^r | 25,900 r | 25,700 ^r | 26,300 |
| Of which: | | | | | |
| Horticultural use | 17,600 ^r | 15,100 ^r | 13,400 ^r | 13,600 ^r | 13,400 |
| Fuel use | 9,940 ^r | 8,930 ^r | 8,120 | 8,440 | 8,590 |
| Unspecified | 3,910 ^r | 4,080 ^r | 4,360 | 3,660 ^r | 4,290 |

^eEstimated. ^pPreliminary. ^rRevised.

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 July 8, 2012. One cubic meter equals 0.8806 metric ton.

³In addition to the countries listed, Austria, Chile, Iceland, Italy, and Romania produced negligible amounts of peat. ⁴Reported figure.

⁵Fiscal year data.