

Forest Nursery Seedling Production in the United States— Fiscal Year 2012

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Background

The U.S. Department of Agriculture (USDA), Forest Service, State and Private Forestry (S&PF) began reporting tree planting in the United States in 1952 in an annual report, *Tree Planting in the United States*. In 2000, the report was discontinued amid growing concern over the manner in which much of the tree planting data were collected.

The data for State, nonindustrial private, and industry lands were gathered and reported each year by the 50 State forestry agencies. By 2000, mergers in the forest industry and the divestiture of their timberlands shifted ownership to timber investment management organizations and real estate investment trusts. Decreased funding of State forestry agencies and reduced staffing made it increasingly difficult for them to gather the data. In addition, the tree planting data collected from some Federal agencies became difficult to gather after the 9/11 terrorist attack, when reporting restrictions were implemented by Homeland Security legislation. As a result, it was difficult to maintain confidence in the robustness of the data used for creating the *Tree Planting Report in the United States*.

In 2010, the USDA Forest Service, Forest Inventory and Analysis (FIA) program and S&PF developed a statistically valid means for reporting tree planting. The data are reported in this new *Forest Nursery Seedling Production in the United States* and were developed through the use of an empirical source and a statistical approximation.

Current Methodology

The empirical data were produced by S&PF in collaboration with Auburn University, the University of Idaho, and Purdue University. Each university was responsible for collecting forest tree seedling production data directly from the forest and conservation nurseries that grow forest tree seedlings in their region of the United States (Auburn University collected from 12 States in the Southeast, the University of Idaho collected

from 17 States in the West, and Purdue University collected from 21 States in the Northeast and Midwest). The statistical approximation is derived from FIA estimates in which tree planting area is based on ground plots collected by States over 5-, 7-, or 10-year periods and compiled as an average annual estimate for the associated period. FIA estimates of acres of trees planted by State may not correlate with the estimates produced by nursery production surveys. However, total acres by region provide a reasonable comparison between the two methods. Data collected are reported by hardwood and conifer seedlings produced and acreage planted of each (table 1) and by bareroot and container seedlings produced (table 2).

The following assumptions were used in compiling this report:

1. The number of seedlings reported by the participating forest and conservation nurseries was the number of shippable seedlings produced for distribution in the 2012 planting season (i.e., seedlings to be planted from the fall of 2011 to the spring of 2012). Some species of forest seedlings require two or more growing seasons to reach accepted forest and conservation seedling size standards, so not all seedlings in production at a nursery at any given time are considered shippable (i.e., available for distribution). Therefore, only shippable seedlings were counted.
2. All of the seedling production reported in this survey met the grading standards for the respective nurseries (i.e., cull seedlings were not included in the estimates). Production estimates are often based on seedbed inventories of seedlings meeting grading standards. However, for cases in which nurseries ship seedlings by weight as opposed to examining and counting each seedling, landowners and tree planters often plant every seedling that is shipped to them, including any cull seedlings.
3. Seedling production data were collected from all the major nurseries that produced forest and conservation tree seedlings for the 2012 planting season. Considerable effort

was made to contact all producers of forest and conservation seedlings. The universities collecting the survey data reported, with few exceptions, that the major producers were included in the results.

4. All seedlings reported in this survey were produced for reforestation and conservation projects. Some of the nurseries that participated in this survey, especially in the Northern United States, produce seedlings for ornamental use, Christmas tree production, or other horticultural purposes. Private nurseries in the Northern United States were asked to report only seedling production destined for conservation and reforestation planting.
5. Forest tree seedlings remain in the general area where they are produced. Forest and conservation seedlings are routinely shipped across State borders and at times across international borders. It is assumed that, on average, the number of seedlings imported into a State is equal to the number of seedlings exported from that State. In the Lake States (Michigan, Minnesota, and Wisconsin), a significant amount of container seedlings produced in Canada are used for planting on State- and county-owned land. Estimates of the amount of seedlings shipped from Canada to the Lake States were obtained from the State nursery programs in these States. In a similar fashion, seedlings produced in forest industry nurseries in Canada are planted on industrial

forest land in Maine. Estimates of the amount of Canadian-grown seedlings planted in Maine were provided by the forest industry.

6. Dividing the number of seedlings shipped by forest and conservation nurseries by the average number of stems planted per acre is an appropriate proxy of the number of acres of trees planted in the 2012 planting season. These estimations do not include direct seeding or natural forest regeneration activities. They are sufficiently robust to provide an accurate indication of tree planting over time.
7. Respondents to the production survey were asked to report only hardwood and conifer trees produced; i.e., they were asked not to include shrubs in production estimates. However, many conservation and restoration plantings include shrubs and herbaceous plants, which are used to address wildlife, biodiversity, or other management objectives. The average number of stems planted per acre used to estimate acres planted may include shrubs in some operations. Using only tree production to estimate acres planted would result in an underestimate of planted acreage where a mixed planting of shrubs and trees occurred. For example, in the Northern United States, State-owned nurseries produced more than 4 million shrubs in addition to the more than 54 million trees reported for the 2012 planting season.

Table 1. Hardwood and conifer tree seedling production and acres planted for each State and each region during the 2011-to-2012 planting year.

State	Hardwood seedlings produced	Hardwood acres planted ^a	Conifer seedlings produced	Canadian conifer imports	Conifer acres planted ^a	Total seedlings produced	Total acres planted ^a	FIA Data acres planted ⁱ
Southeast								
Florida ^b	4,240,000	7,709	31,502,000	—	57,276	35,742,000	64,985	140,247
Georgia ^b	7,207,000	13,104	296,090,000	—	538,345	303,297,000	551,449	196,602
North Carolina ^b	—	—	63,223,000	—	114,951	63,223,000	114,951	108,286
South Carolina ^b	3,540,000	6,436	105,822,000	—	192,404	109,362,000	198,840	55,479
Virginia ^b	805,000	1,464	25,065,000	—	45,573	25,870,000	47,036	92,707
Regional totals	15,792,000	28,713	521,702,000	0	948,549	537,494,000	977,262	593,320
South Central								
Alabama ^b	899,000	1,635	87,308,000	—	158,741.82	88,207,000	160,376	263,720
Arizona ^b	12,686,000	23,065	86,940,000	—	158,073	99,626,000	181,138	156,973
Kentucky ^c	1,865,512	4,289	308,030	—	708	2,173,542	4,997	1,479
Louisiana ^b	4,580,000	8,327	26,409,000	—	48,016	30,989,000	56,344	166,984
Mississippi ⁱ	1,038,000	1,887	87,102,000	—	158,367	88,140,000	160,255	192,746
Oklahoma ^b	1,044,000	1,898	3,196,000	—	5,811	4,240,000	7,709	25,434
Tennessee ^b	1,508,000	2,742	5,634,000	—	10,244	7,142,000	12,985	22,489
Texas ^b	37,000	67	78,870,000	—	143,400	78,907,000	143,467	113,125
Regional totals	23,657,512	43,911	375,767,030	0	683,361	399,424,542	727,272	942,949
Northeast								
Connecticut	—	—	—	—	—	—	—	—
Delaware	—	—	—	—	—	—	—	—
Massachusetts	—	—	—	—	—	—	—	—
Maryland ^d	897,180	1,631	1,166,800	—	2,121	2,063,980	3,753	—
Maine ^{d, i}	—	—	0	2,000,000	2,500	2,000,000	2,500	8,284
New Hampshire ^e	26,500	48	179,075	—	326	205,575	374	—

Table 1. Hardwood and conifer tree seedling production and acres planted for each State and each region during the 2011-to-2012 planting year (continued).

State	Hardwood seedlings produced	Hardwood acres planted ^a	Conifer seedlings produced	Canadian conifer imports	Conifer acres planted ^a	Total seedlings produced	Total acres planted ^a	FIA Data acres planted ⁱ
Northeast continued								
New Jersey ^c	1,239,540	2,254	429,950	—	782	1,669,490	3,035	—
New York ^e	108,322	120	810,544	—	901	918,866	1,021	203
Pennsylvania ^c	1,148,777	2,089	3,174,903	—	5,773	4,323,680	7,861	1,391
Rhode Island	—	—	—	—	—	—	—	—
Vermont	—	—	—	—	—	—	—	—
West Virginia ^c	764,500	1,390	81,000	—	147	845,500	1,537	—
Regional Totals	4,184,819	7,532	5,842,272	2,000,000	12,549	12,027,091	20,081	9,878
North Central								
Iowa ^e	1,447,450	2,412	410,000	—	683	1,857,450	3,096	—
Illinois ^c	1,452,705	3,340	308,510	—	709	1,761,215	4,049	5,062
Indiana ^d	3,774,099	5,806	1,417,592	—	2,181	5,191,691	7,987	1,331
Michigan ^{b,i}	5,697,300	10,359	13,731,000	1,500,000	15,231	20,928,300	25,590	11,899
Minnesota ^{b,i}	1,684,775	3,063	13,239,500	4,275,000	29,191	19,199,275	32,254	20,059
Missouri ^c	4,095,900	9,416	766,375	—	1,762	4,862,275	11,178	—
Ohio ^c	5,000	11	—	—	—	5,000	11	3,775
Wisconsin ^{f,i}	1,964,850	2,456	13,875,400	1,000,000	18,594	15,840,250	21,050	9,413
Regional Totals	20,122,079	36,864	43,748,377	6,775,000	68,351	69,645,456	105,214	51,540
Great Plains								
Kansas ^b	100,000	182	—	—	—	100,000	182	—
North Dakota ^b	1,720,000	3,127	1,500,000	—	2,727	3,220,000	5,855	—
Nebraska ^b	800,000	1,455	1,200,000	—	2,182	2,000,000	3,636	—
South Dakota ^b	800,000	1,455	419,000	—	762	1,219,000	2,216	—
Regional Totals	3,420,000	6,218	3,119,000	0	5,671	6,539,000	11,889	0
Intermountain								
Arizona ^b	38,060	69	1,520	—	3	39,580	72	—
Colorado ^b	750,000	1,364	750,000	—	1,364	1,500,000	2,727	—
Idaho ^b	1,002,750	1,823	4,667,500	—	8,486	5,670,250	10,310	4,287
Montana ^b	344,000	625	525,000	—	955	869,000	1,580	5,142
New Mexico ^b	28,400	52	72,500	—	132	100,900	183	—
Nevada ^b	1,000	2	500	—	1	1,500	3	—
Utah	—	—	—	—	—	—	—	—
Wyoming	—	—	—	—	—	—	—	—
Regional Totals	2,164,210	3,935	6,017,020	0	10,941	8,181,230	14,875	9,429
Alaska								
Alaska	—	—	—	—	—	—	—	806
Pacific Northwest								
Oregon ^g	2,529,500	7,227	58,359,500	—	166,741	60,889,000	173,969	88,379
Washington ^g	2,719,800	7,771	78,323,000	—	223,780	81,042,800	231,551	54,179
Regional Totals	5,249,300	14,998	136,682,500	0	390,521	141,931,800	405,520	142,558
Pacific Southwest								
California ^b	16,400	30	14,202,400	—	25,823	14,218,800	25,852	29,535
Hawaii ^h	100,000	182	5,000	—	9	105,000	191	—
Regional Totals	116,400	212	14,207,400	0	25,832	14,323,800	26,043	29,535
Totals	74,706,320	142,382	1,107,085,599	8,775,000	2,145,775	1,190,552,819	2,288,156	1,780,014

^a Acres planted were estimated assuming:^b 550 stems/acre^c 435 stems/acre^d 650 stems/acre^e 600 stems/acre^f 800 stems/acre^g 350 stems/acre^h 450 stems/acreⁱ Totals include an estimate of conifers produced in Canada for distribution to neighboring states; bareroot imports for ME and container for other states.^j Average annual acreage planted was estimated for all States on 5-year cycles except Alabama, Louisiana, and North Carolina are 7-year cycles and Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, and Washington are 10-year cycles; data generated by R. Harper.

Table 2. Bareroot and container tree seedling production for each State and each region during the 2011-to-2012 planting year.

State	Bareroot	Container	Total seedlings produced	State	Bareroot	Container	Total seedlings produced
Southeast				North Central continued			
Florida	28,598,000	7,144,000	35,742,000	Michigan	19,428,300	—	20,928,300
Georgia	162,966,000	140,331,000	303,297,000	Minnesota	9,364,275	5,560,000	19,199,275
North Carolina	45,709,000	17,514,000	63,223,000	Missouri	4,454,775	407,500	4,862,275
South Carolina	107,704,000	1,658,000	109,362,000	Ohio	—	5,000	5,000
Virginia	25,870,000	—	25,870,000	Wisconsin	15,840,100	150	15,840,250
Regional totals	370,847,000	166,647,000	537,494,000	Regional totals	57,701,891	6,168,565	69,645,456
South Central				Great Plains			
Alabama	82,048,000	6,159,000	88,207,000	Kansas	—	100,000	100,000
Arizona	99,626,000	—	99,626,000	North Dakota	3,125,000	95,000	3,220,000
Kentucky	2,173,542	—	2,173,542	Nebraska	1,125,000	875,000	2,000,000
Louisiana	30,364,000	625,000	30,989,000	South Dakota	1,180,000	39,000	1,219,000
Mississippi	80,111,000	8,029,000	88,140,000	Regional totals	5,430,000	1,109,000	6,539,000
Oklahoma	4,195,000	45,000	4,240,000	Intermountain			
Tennessee	7,142,000	—	7,142,000	Arizona	—	39,580	39,580
Texas	78,907,000	—	78,907,000	Colorado	—	1,500,000	1,500,000
Regional totals	384,566,542	14,858,000	399,424,542	Idaho	3,000,000	2,670,250	5,670,250
Nottheast				Montana	300,000	569,000	869,000
Connecticut	—	—	—	New Mexico	100	100,800	100,900
Delaware	—	—	—	Nevada	1,500	—	1,500
Massachusetts	—	—	—	Utah	—	—	—
Maryland	2,063,980	—	2,063,980	Wyoming	—	—	—
Maine	—	—	2,000,000	Regional totals	3,301,600	4,879,630	8,181,230
New Hampshire	205,575	—	205,575	Alaska			
New Jersey	544,490	1,125,000	1,669,490	Alaska	—	—	—
New York	854,400	64,466	918,866	Pacific Northwest			
Pennsylvania	4,314,580	9,100	4,323,680	Oregon	34,290,000	26,599,000	60,889,000
Rhode Island	—	—	—	Washington	51,600,000	29,442,800	81,042,800
Vermont	—	—	—	Regional totals	85,890,000	56,041,800	141,931,800
West Virginia	845,500	—	845,500	Pacific Southwest			
Regional totals	8,828,525	1,198,566	12,027,091	California	—	14,218,800	14,218,800
North Central				Hawaii	—	105,000	105,000
Iowa	1,842,950	14,500	1,857,450	Regional totals	—	14,323,800	14,323,800
Illinois	1,759,800	1,415	1,761,215	Totals	918,565,558	272,001,361	1,190,552,819
Indiana	5,011,691	180,000	5,191,691				

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