

Forest Nursery Seedling Production in the United States—Fiscal Year 2016

George Hernández, Diane L. Haase, Carolyn Pike, Scott Enebak, Lori Mackey, Zhao Ma, and Mysha Clarke

Southern Region Regeneration Specialist, U.S. Department of Agriculture (USDA) Forest Service, Atlanta, GA; Western Nursery Specialist, USDA Forest Service, Portland, OR; Northeastern Area Regeneration Specialist, USDA Forest Service, West Lafayette, IN; Director, Southern Forest Nursery Management Cooperative, School of Forestry and Wildlife Sciences, Auburn University, Auburn, AL; Special Projects Coordinator, Center for Forest Nursery and Seedling Research, Department of Forest, Rangeland, and Fire Sciences, University of Idaho, Moscow, ID; Professor, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN; Graduate Student, Department of Forestry and Natural Resources, Purdue University, West Lafayette, IN

Abstract

Forest nursery production for the 2016 planting season was more than 1.2 billion forest tree seedlings, with nearly 2.5 million ac (1 million ha) of trees planted. The majority of production and planting (82 percent) occurred in the Southern States. Approximately 75 percent of outplanted trees are bareroot stock.

Background

This annual report summarizes forest nursery seedling production in the United States. The number of seedlings reported is used to estimate the number of acres of forest planting per year. Prepared by the U.S. Department of Agriculture (USDA), Forest Service, Forest Inventory and Analysis (FIA) and State and Private Forestry (S&PF), this report includes State-by-State breakdowns, regional totals, and an analysis of data trends. Universities located in the southern, northeast, and western regions of the United States made an effort to collect data from all the major producers of forest and conservation seedlings in the 50 States. Forest and conservation nursery managers provided the information presented in this report. As far as we know, it is the most complete compilation of such data in the country. Because all data are provided voluntarily by outside sources, and some data are estimated, however, caution must be used in drawing inferences.

Methodology

The empirical data for this report were produced by S&PF in collaboration with Auburn University, the University of Idaho, and Purdue University. All of these universities collected 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 13 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 approximation of planted acres for each State is derived from FIA estimates of tree-planting area based on ground plots collected by States during 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 because nurseries do not report shipments across State lines. Total acres by region, however, 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). A complete list of the assumptions used in compiling this report appear in the *Forest Nursery Seedling Production in the United States—Fiscal Year 2013* (Harper et. al. 2014).

Table 1. Hardwood and conifer tree seedling production and acres planted for each State and each region during the 2015-2016 planting year.

State	Hardwood seedlings produced	Hardwood acres planted ¹	Conifer seedlings produced	Canadian conifer imports	Conifer acres planted ¹	Total seedlings produced	Total acres planted ¹	FIA data acres planted ¹⁰
Southeast								
Florida ²	3,023,129	5,497	57,415,000	—	104,391	60,438,129	109,888	152,359
Georgia ²	4,595,369	8,355	330,238,125	—	600,433	334,833,494	608,788	239,619
North Carolina ²	506,650	921	65,331,000	—	118,784	65,837,650	119,705	99,215
South Carolina ²	1,061,880	1,931	138,241,398	—	251,348	139,303,278	253,279	76,808
Virginia ²	838,000	1,524	30,202,000	—	54,913	31,040,000	56,436	74,872
Regional Totals	10,025,028	18,227	621,427,523	0	1,129,868	631,452,551	1,148,096	642,873
South Central								
Alabama ²	101,624	185	115,900,035	—	210,727	116,001,659	210,912	223,021
Arkansas ²	9,186,275	16,702	89,632,550	—	162,968	98,818,825	179,671	117,744
Kentucky ³	540,000	1,241	20,000	—	45.98	560,000	1,287	1,155
Louisiana ²	—	—	23,735,000	—	43,155	23,735,000	43,155	160,801
Mississippi ²	1,012,734	1,841	83,035,100	—	150,973	84,047,834	152,814	178,998
Oklahoma ²	454,275	826	858,250	—	1,560	1,312,525	2,386	21,521
Tennessee ²	2,302,000	4,185	5,136,000	—	9,338	7,438,000	13,524	28,005
Texas ²	28,175	51	71,699,800	—	130,363	71,727,975	130,415	262,584
Regional Totals	13,625,083	32,589	390,016,735	0	709,131	403,641,818	734,163	993,829
Northeast								
Connecticut	—	—	—	—	—	—	—	—
Delaware	—	—	—	—	—	—	—	647
Maine ^{5,9}	—	—	—	13,500,000	22,500	13,500,000	22,500	8,168
Maryland ²	651,375	1,184	1,333,609	—	2,425	1,984,984	3,609	1,445
Massachusetts	—	—	—	—	—	—	—	—
New Hampshire ³	17,200	40	79,600	—	183	96,800	223	—
New Jersey ³	472,710	1,087	95,650	—	220	568,360	1,307	—
New York ⁵	209,000	348	751,500	—	1,253	960,500	1,601	—
Pennsylvania ³	2,621,419	6,026	3,402,720	—	7,822	6,024,139	13,849	2680
Rhode Island	—	—	—	—	—	—	—	—
Vermont ³	51,000	117	500	—	—	—	—	—
West Virginia ³	394,00	906	47,000	—	329	664,375	1527	870
Regional Totals	4,416,704	9,708	5,710,579	13,500,000	34,512	23,627,283	44,220	13,810
North Central								
Illinois ³	961,610	2,211	170,700	—	392	1,132,310	2,603	2,498
Indiana ⁴	2,812,000	4,326	1,137,000	—	1,749	3,949,000	6,075	1,753
Iowa ⁵	657,319	1,096	197,255	—	329	854,574	1,424	621
Michigan ²	3,661,265	6,657	14,375,255	—	26,137	18,036,520	32,794	9,467
Minnesota ^{2,9}	431,571	785	4,931,077	8,365,000	24,175	13,727,648	24,959	17,470
Missouri ³	4,536,714	10,429	1,497,000	—	3,441	6,033,714	13,871	—
Ohio ³	8,800	20	20	—	—	8,800	20	3,018
Wisconsin ⁶	984,200	1,230	6,330,958	—	4,951	4,944,781	6,181	10,459
Regional Totals	14,053,479	26,754	26,268,868	8,365,000	61,174	48,687,347	87,928	45,286

State	Hardwood seedlings produced	Hardwood acres planted ¹	Conifer seedlings produced	Canadian conifer imports	Conifer acres planted ¹	Total seedlings produced	Total acres planted ¹	FIA data acres planted ¹⁰
Great Plains								
Kansas ²	8,475	15	35,150	—	64	43,625	79	—
Nebraska ²	516,697	939	1,376,067	—	2,502	1,892,764	3,441	1182
North Dakota ²	17,234	31	832,220	—	1,513	849,454	1,544	—
South Dakota ²	755,233	1,373	398,295	—	724	1,153,528	2,097	—
Regional Totals	1,297,639	2,359	2,641,732	0	4,803	3,939,371	7,162	0
Intermountain								
Arizona ²	500	1	—	—	—	500	1	597
Colorado ²	344,999	627	263,345	—	479	608,344	1,106	—
Idaho ²	9,075,607	16,501	5,207,297	800,000	10,922	15,082,904	27,423	7108
Montana ²	145,427	264	603,196	—	1,097	748,623	1,361	8082
Nevada ²	10,845	20	3,183	—	6	14,028	26	—
New Mexico ²	20,301	37	122,346	—	222	142,647	259	872
Utah ²	605,425	1,101	215,820	—	392	821,245	1,493	—
Wyoming	—	—	—	—	—	—	—	997
Regional Totals	10,203,104	18,551	6,415,187	800,000	16,465	17,418,291	31,670	17,656
Alaska								
Alaska ²	7500	14	4,250	10,000	26	21,750	40	—
Pacific Northwest								
Oregon ^{7,9}	4,679,470	13,370	45,888,630	2,834,000	139,208	53,402,100	152,577	133,374
Washington ^{7,9}	724,031	2,069	52,566,885	76,000	150,408	53,366,916	152,477	97,872
Regional Totals	5,403,501	15,439	98,455,515	2,910,000	289,616	106,769,016	305,054	231,246
Pacific Southwest								
California ⁸	109,675	244	24,225,500	—	53,834	24,335,175	54,078	33,657
Hawaii ⁸	125,462	279	198,012	—	440	323,474	719	—
Regional Totals	235,137	523	24,423,512	0	54,274	24,658,649	54,797	33,657
Totals	59,267,175	116,607	1,175,363,901	25,585,000	2,296,523	1,260,216,076	2,413,129	1,978,357

¹ Acres planted were estimated assuming:

² 550 stems/acre

³ 435 stems/acre

⁴ 650 stems/acre

⁵ 600 stems/acre

⁶ 800 stems/acre

⁷ 350 stems/acre

⁸ 450 stems/acre

⁹ Totals include an estimate of conifers produced in Canada for distribution to neighboring States; bareroot imports for Maine and containers for other States.

¹⁰ FIA = Forest Inventory and Analysis; average annual acreage planted estimated for all States (2017) on 5-year cycles, except for Alabama, Louisiana, Mississippi, and North Carolina, which are on 7-year cycles, and for Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, and Washington, which are on 10-year cycles. Data generated by Andy Hartsell, USDA Forest Service.

Table 2. Bareroot and container tree seedling production for each State and each region during the 2015-2016 planting year.

State	Bareroot	Container ¹	Total Seedlings Produced	State	Bareroot	Container ¹	Total Seedlings Produced
Southeast				Michigan	17,684,750	351,770	18,036,520
Florida	52,566,263	7,871,866	60,438,129	Minnesota	4,546,648	9,181,000	13,727,648
Georgia	190,526,822	144,306,672	334,833,494	Missouri	4,533,714	1,500,000	6,033,714
North Carolina	52,460,000	13,377,650	65,837,650	Ohio	—	8,800	8,800
South Carolina	138,920,008	383,270	139,303,278	Wisconsin	4,891,581	53,200	4,944,781
Virginia	31,038,000	2,000	31,040,000	Regional Totals	37,440,267	11,247,080	48,687,347
Regional Totals	465,511,093	165,941,458	631,452,551	Great Plains			
South Central				Kansas	43,625	—	43,625
Alabama	109,012,259	6,989,400	116,001,659	North Dakota	1,082,692	810,072	1,892,764
Arkansas	98,818,825	—	98,818,825	Nebraska	766,146	83,308	849,454
Kentucky	560,000	—	560,000	South Dakota	1,145,746	7,782	1,153,528
Louisiana	—	23,735,000	23,735,000	Regional Totals	3,038,209	901,162	3,939,371
Mississippi	74,947,834	9,100,000	84,047,834	Intermountain			
Oklahoma	1,281,025	31,500	1,312,525	Arizona	—	500	500
Tennessee	7,438,000	—	7,438,000	Colorado	174,483	433,861	608,344
Texas	71,727,975	—	71,727,975	Idaho	5,188,783	9,894,121	15,082,904
Regional Totals	363,785,918	39,855,900	403,641,818	Montana	103,080	645,543	748,623
Northeast				New Mexico	—	14,028	14,028
Connecticut	—	—	—	Nevada	20,000	122,647	142,647
Delaware	—	—	—	Utah	—	821,245	821,245
Maine ^{5,9}	—	13,500,000	13,500,000	Wyoming	—	—	—
Maryland	1,926,484	58,500	1,984,984	Regional Totals	5,486,346	11,931,945	17,418,291
Massachusetts	-	—	-	Alaska			
New Hampshire	96,800	—	96,800	Alaska	—	21,750	21,750
New Jersey	193,360	375,000	568,360	Pacific Northwest			
New York	902,500	58,000	960,500	Oregon	18,176,080	35,226,020	53,402,100
Pennsylvania	6,016,239	7,900	6,024,139	Washington	33,277,585	20,089,331	53,366,916
Rhode Island	—	—	—	Regional Totals	51,453,665	55,315,351	106,769,016
Vermont	—	1,000	51,500	Pacific Southwest			
West Virginia	50,500	—	441,000	California	700,000	23,635,175	24,335,175
Regional Totals	9,626,883	14,000,400	23,627,283	Hawaii	90,554	232,920	323,474
North Central				Regional Totals	790,554	23,868,095	24,658,649
Illinois	1,130,000	2,310	1,132,310	Totals	937,132,935	323,083,141	1,260,216,076
Indiana	3,799,000	150,000	3,949,000				
Iowa	854,574	—	854,574				

¹ Alaska, Idaho, Maine, Michigan, Minnesota, Oregon, and Washington received container seedlings produced in Canada.

Data Trends

An estimated total of 1,260,216,076 forest tree seedlings were shipped from forest and conservation nurseries in the United States in FY 2016, a decrease of 3 percent compared with seedling production reported for FY 2015 (Hernández et al. 2016). Based on the total number of seedlings shipped and the average number of seedlings planted per acre in each State, an estimated

2,413,129 ac (976,559 ha) of trees were planted during the planting season from fall 2015 through spring 2016. Although seedling production decreased, acreage planted increased 3 percent compared with the number of acres reported for the previous planting season (Hernández et al. 2016); this increase is attributed to the varying plant densities used in each State.

Table 3. Total forest nursery seedling production, including region, by year, from FY 2012 through FY 2015.

Year	Total seedling production	West	East	South
FY 2016	1,260,216,076	152,785,327	72,314,630	1,035,094,369
FY 2015	1,302,237,795	175,464,446	95,417,986	1,031,355,363
FY 2014	1,217,607,888	115,620,820	85,684,417	1,015,564,370
FY 2013	1,181,554,535	96,344,063	102,066,671	983,143,801
FY 2012	1,190,552,819	170,975,830	81,672,547	936,918,542

FY = fiscal year.

Sources: This report, Harper et al. (2013, 2014), and Hernández et al. (2015, 2016).

Trends by regions (table 3) are as follows:

West—The 17 States in the USDA Forest Service western regions produced more than 150 million seedlings (12 percent of the U.S. total), a decrease from the previous season.

East—The 20 States in the USDA Forest Service Northeastern Area reported more than 72 million seedlings (6 percent of the U.S. total), a decrease compared with the previous four planting seasons.

South—The 13 States in the USDA Forest Service Southern Region produced more than 1 billion forest tree seedlings (82 percent of the U.S. total), an increase of more than 1 million over the FY 2015 planting season.

Address correspondence to—

George Hernández, Regional Regeneration Specialist, U.S. Department of Agriculture, Forest Service, State and Private Forestry, 1720 Peachtree Road NW, Atlanta, GA 30309; email: ghernandez@fs.fed.us; phone: 404-347-3554.

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