Historical Forest Seedling Production in the Southern United States: 2008 to 2009 Planting Season

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Abstract: Seedling production across the southern US for the 2008 to 2009 planting season was 1.05 billion seedlings, a decrease of 53.6 million (5%) from the 2007 to 2008 planting season. The vast majority (90%) of reduction in conifer seedling production from 2008 was bareroot loblolly (*Pinus taeda*) and slash (*P. elliottii*) pine. Hardwoods were about 1% of regional seedling production, a decrease of 2.7% from the 2007 planting season. Only 1% of all seedlings were grown in containers, with longleaf pine (*P. palustris*) comprising the majority of this production. During the past 80 years of tree planting, seedling outplanting peaked at 1.1 million ha (2.7 million ac) in 1991 and has declined annually. In addition to fewer hectares planted and a reduction in seedlings produced, more than 25 forest seedling nurseries have ceased operations since 1995.

Keywords: bareroot nurseries, container nurseries, conifer seedlings, hardwood seedlings

Introduction

Seedling production and planting numbers in the southern United States have historically been collected by the USDA Forest Service and forest agencies of individual states. These data have been published in several types of reports that include single-year and multiple-year summaries (for example, Williston 1980; Moulton 1999; Moulton and Hernandez 1999; Georgia Forestry Commission's annual Planting Report). To supplement these data, in 2002, Auburn University Southern Forest Nursery Management Cooperative (SFNMC) began conducting a southern United States annual survey to determine production numbers for the previous planting season.

Seedling production data from 2002 to 2009 was obtained through a questionnaire mailed in June of each year to more than 200 plant nurseries in 12 southern states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. The questionnaire was two pages in length and requested production numbers (not sales) for the nursery season for major pine and hardwood species. We attempted to contact all nurseries, regardless of affiliation or ownership, including those not associated with the SFNMC. The survey was followed by phone contact until the information from all nurseries was received. Additionally, The Longleaf Alliance, headquartered in Andalusia, AL, was contacted, and longleaf pine (*Pinus palustris*) seedling production by type was compared among both organizations to ensure that the smaller seedling producers that were not members of the SFNMC were included.

2008 to 2009 Seedling Production

Conifer Seedling Production

A total of 851 million bareroot (Table 1) and 124.7 million container (Table 2) conifer seedlings were produced during the 2008 to 2009 season, for a total conifer production of 975.7 million (Table 3). This was a decrease of 10% in bareroot production and an increase of 79% in container conifer production over last year. Overall, there was a decrease of 4.2% across the region in seedling production from 1.02 billion conifers produced in 2007 to 2008. Loblolly pine (*P. taeda*) was the most commonly grown species in the region, accounting for 81% of all conifer production, followed by slash pine (*P. elliottii*) at 9%, and longleaf pine at 8%. These three species accounted for 98% of all conifers produced in 2008 to 2009. Baldcypress (*Taxodium distichum*) was the fourth most important species in terms of production (0.3%), followed closely by white pine (*P. strobus*), shortleaf pine (*P. echinata*), sand pine (*P. clausa*), Virginia pine (*P. virginiana*) and Fraser fir (*Abies fraseri*) (Table 3).

Table 1. Bareroot conifer seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Baldcypress		Fraser fir		Loblolly pine		Longleaf pine		Others		Sand pine		Shortleaf pine		Slash pine		Virginia pine		White Pine		Total	
		%*		%*		%*		%*				%*		%*		%*		%*		%*		%**
Alabama	82	0	0	0	122,769	95	227	0	0	0	0	0	0	0	6,056	5	79	0	0	0	**129,213**	**15**
Arkansas	821	1	0	0	104,772	99	0	0	0	0	0	0	550	1	0	0	0	0	0	0	**106,143**	**12**
Florida	795	2	0	0	2,214	6	5,048	14	1097	3	1,373	4	0	0	24,233	70	81	0	0	0	**34,841**	**4**
Georgia	270	0	0	0	98,320	71	2,035	1	200	0	0	0	40	0	37,764	27	170	0	0	0	**138,799**	**16**
Louisiana	350	1	0	0	18,339	75	370	2	51	0	0	0	0	0	5,429	22	70	0	0	0	**24,609**	**3**
Mississippi	141	0	0	0	86,814	100	0	0	0	0	0	0	0	0	264	0	0	0	0	0	**87,219**	**10**
North Carolina	75	0	744	1	48,000	95	100	0	30	0	0	0	200	0	0	0	110	0	1,200	2	**50,459**	**6**
Oklahoma	43	1	0	0	4,649	92	0	0	216	4	0	0	69	1	0	0	64	1	0	0	**5,041**	**1**
South Carolina	334	0	0	0	137,737	95	1,908	1	896	1	0	0	0	0	3,748	3	48	0	72	0	**144,743**	**17**
Tennessee	112	2	0	0	4,021	84	0	0	80	2	0	0	304	6	0	0	141	3	123	3	**4,781**	**1**
Texas	0	0	0	0	91,291	90	0	0	0	0	0	0	0	0	9,905	10	598	1	0	0	**101,794**	**12**
Virginia	40	0	0	0	22,000	94	0	0	0	0	0	0	175	1	0	0	200	1	950	4	**23,365**	**3**
Region	**3,063**	**0**	**744**	**0**	**740,926**	**87**	**9,688**	**1**	**2,570**	**0**	**1,373**	**0**	**1,338**	**0**	**87,399**	**10**	**1,561**	**0**	**2,345**	**0**	**851,007**	

*Percentage of state production
**Percentage of regional production

Table 2. Container conifer seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Baldcypress		Fraser fir		Loblolly pine		Longleaf pine		Others		Sand pine		Shortleaf pine		Slash pine		Virginia pine		White pine		Total	
		%*		%*		%*		%*				%*		%*		%*		%*		%*		%**
Alabama	0	0	0	0	2,635	66	1,351	34	0	0	0	0	0	0	0	0	0	0	0	0	**3,986**	**3**
Arkansas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Florida	98	1	0	0	1	0	10,161	89	460	4	35	0	0	0	650	6	0	0	0	0	**11,405**	**9**
Georgia	5	0	0	0	36,793	40	52,145	56	177	0	0	0	825	1	3161	3	15	0	0	0	**93,121**	**75**
Louisiana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Mississippi	0	0	0	0	1,158	27	3,062	73	0	0	0	0	0	0	0	0	0	0	0	0	**4,220**	**3**
North Carolina	0	0	160	1	4,600	42	5,500	50	770	7	0	0	0	0	0	0	0	0	0	0	**11,030**	**9**
Oklahoma	0	0	0	0	2	25	0	0	5	63	0	0	0	0	0	0	1	13	0	0	**8**	**0**
South Carolina	0	0	0	0	6	1	920	99	0	0	0	0	0	0	0	0	0	0	0	0	**926**	**1**
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Texas	1	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**
Virginia	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Region	**104**	**0**	**160**	**0**	**45,195**	**36**	**73,139**	**59**	**1,412**	**1**	**35**	**0**	**825**	**1**	**3,811**	**3**	**16**	**0**	**0**	**0**	**124,697**	

*Percentage of state production
**Percentage of regional production

Table 3. Conifer seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Baldcypress		Fraser fir		Loblolly pine		Longleaf pine		Others		Sand pine		Shortleaf pine		Slash pine		Virginia pine		White pine		Total	
		%*		%*		%*		%*		%*		%*		%*		%*		%*		%*		%**
Alabama	82	0	0	0	125,404	94	1,578	1	0	0	0	0	0	0	6,056	5	79	0	0	0	**133,199**	**14**
Arkansas	821	1	0	0	104,772	99	0	0	0	0	0	0	550	1	0	0	0	0	0	0	**106,143**	**11**
Florida	893	2	0	0	2,215	5	15,209	33	1557	3	1,408	3	0	0	24,883	54	81	0	0	0	**46,246**	**5**
Georgia	275	0	0	0	135,113	58	54,180	23	377	0	0	0	865	0	40,925	18	185	0	0	0	**231,920**	**24**
Louisiana	350	1	0	0	18,339	75	370	2	51	0	0	0	0	0	5,429	22	70	0	0	0	**24,609**	**3**
Mississippi	141	0	0	0	87,972	96	3,062	3	0	0	0	0	0	0	264	0	0	0	0	0	**91,439**	**9**
North Carolina	75	0	904	1	52,600	86	5,600	9	800	1	0	0	200	0	0	0	110	0	1,200	2	**61,489**	**6**
Oklahoma	43	1	0	0	4,651	92	0	0	221	4	0	0	69	1	0	0	65	1	0	0	**5,049**	**1**
South Carolina	334	0	0	0	137,743	95	2,828	2	896	1	0	0	0	0	3,748	3	48	0	72	0	**145,669**	**15**
Tennessee	112	2	0	0	4,021	84	0	0	80	2	0	0	304	6	0	0	141	3	123	3	**4,781**	**0**
Texas	1	0	0	0	91,291	90	0	0	0	0	0	0	0	0	9,905	10	598	1	0	0	**101,795**	**10**
Virginia	40	0	0	0	22,000	94	0	0	0	0	0	0	175	1	0	0	200	1	950	4	**23,365**	**2**
Region	**3,167**	**0**	**904**	**0**	**786,121**	**81**	**82,827**	**8**	**3,982**	**0**	**1,408**	**0**	**2,163**	**0**	**91,210**	**9**	**1577**	**0**	**2345**	**0**	**975,704**	

*Percentage of state production
**Percentage of regional production

The conifer category "others" (pitch pine [*P. rigida*], Atlantic white-cedar [*Chamaecyparis thyoides*], and pitch × loblolly) made up just under 4 million of other conifer species grown in 2008 to 2009.

Container seedlings comprised 12.7% of conifer production, up from 6.8% of the conifers produced in 2007 to 2008. This is an increase (55 million) over last year, primarily consisting of longleaf and loblolly pine at 73.1 million and 45.1 million seedlings, respectively. Container production of longleaf seedlings for the 2008 to 2009 growing season was 88%, up from 83% for 2007 to 2008. Georgia was, by far, the primary producer of container conifer seedlings at 93.13 million, or 75% of all container conifer seedlings produced in 2008 to 2009.

All surveyed states produced conifer nursery stock. The amount ranged from 231.9 million in Georgia to about 4.7 million in Tennessee. Georgia produced 24% of all conifer planting stock in the southern US. In terms of total conifer production, the order was: Georgia, South Carolina, Alabama, Arkansas, Texas, Mississippi, North Carolina, Florida, Louisiana, Virginia, Oklahoma, and Tennessee (Table 3).

Hardwood Seedling Production

In the southern region, 28.9 million bareroot (Table 4) and 321,000 container (Table 5) hardwood seedlings were produced during the 2008 to 2009 season; total hardwood seedling production was 29.2 million (Table 6). This is a reduction of more than 10 million (or 25%) hardwood seedlings from 2007 to 2008, and 23 million less than the 52.4 million produced in the 2006 to 2007 growing season (McNabb 2007). Of those species being produced, *Quercus* was by far the most important genera, comprising 61% of all hardwood production (17.8 million). This is followed by "others" at 26%, green ash (*Fraxinus pennsylvanica*) at 4%, sweetgum (*Liquidambar styraciflua*) at 3%, pecan (*Carya illinoensis*) at 2%, dogwood (*Cornus* spp.) at 2%, yellow poplar (*Liriodendron tulipifera*) at 1%, sycamore (*Platanus occidentalis*) at 1%, black walnut (*Juglans nigra*) at 1%, and cottonwood (*Populus deltoides*) at 0.3%. Hardwoods were grown in all states surveyed, ranging from 9.1 million in Arkansas to 10,000 in Texas. The top five hardwood producing states in the region were Arkansas, South Carolina, Florida, Georgia, and Louisiana (Table 6).

Production by Ownership Category

With the reclassification of nursery production from industry (International Paper) to private (ArborGen), there was a major shift of seedling production by ownership category (Table 7). A "private" nursery is defined as private ownership but not part of an organization or company that operates a wood processing facility, that is, "non-industrial." In 2007 to 2008, the majority of seedling production occurred within industrial nurseries (767.5 million, or 73%), followed far behind by private nurseries (150.0 million, or 14%), with state nurseries a close third (140.5 million, or 13%). In 2008 to 2009, there was a switch from last year's survey in terms of the proportion of total seedling production by owner category, with private nurseries surpassing state nursery production. Privately run nurseries produced 503.7 million seedlings (50%), followed by industrial nurseries at 377.1 million (38%), and state nurseries at 123.9 million (12%). Private nurseries supplied 80% of container conifer planting stock (99.9 million), followed by industry at 12% (15.3 million), and state nurseries at 8% (9.4 million) (Table 8). With the reclassification of the nursery producers, it is difficult to determine overall trends in container versus bareroot production. Overall bareroot seedling production is down 10%, and container seedling production is up an astounding 79% from last year's growing season. So while some nurseries cut back on bareroot seedling production, there were some nurseries that significantly increased container production (primarily longleaf pine) during the last year.

In the 2007 to 2008 growing season, state nurseries had the largest proportion of hardwood seedling production (17.6 million, or 45%) when compared to either the industry (12.6 million, or 32%) or private (8.7 million, or 22%) producers (Table 9). In 2008 to 2009, private nurseries produced more hardwood seedlings (13.0 million, or 45%) than both state (12.7 million, or 44%) and industrial nurseries (3.0 million, or 11%). While some of this increase in private over industrial production may be due to the reclassification of nurseries as described above, this is the first time in 7 years that state nurseries did not lead in hardwood production.

Seedling production for all stocktypes (container or bareroot) and tree type (conifer, hardwood) by forest agency (state, private, industry) and by state is shown in Table 10. Overall, private forest seedling nurseries produced 504 million or 50% of all seedlings grown. This was followed by industrial nurseries at 377.2 million (38%) seedlings and then state nurseries at 123.9 million (12%) seedlings.

State Ranking and Changes from 2007 to 2008

A comparison of state-by-state ranking is provided in Table 11. The 5% decline in total seedling production from last year is not distributed evenly across the region. While a few states had a moderate reduction in seedling production (that is, Arkansas down 2%; Georgia down 5%; and Oklahoma down 5%), four states had significant reductions in seedling production from last year's growing season (Mississippi down 12%; North Carolina down 9%; Virginia down 26%; and South Carolina down 14%). Florida was the only state to increase their seedling production from last year, by 39%. Four states, Alabama, Louisiana, Tennessee, and Texas, remained unchanged in 2008 to 2009 from the 2007 to 2008 growing season. Despite the rather large swings in seedling production in an individual state, it does not necessarily indicate a large change in regional production, as seedling production is down region-wide from last year.

Total Seedling Production

Collectively, the forest seedling nurseries surveyed in the southern US produced 851.0 million bareroot conifers, 124.7 million container conifers, 28.8 million bareroot hardwoods, and 321,000 container hardwoods during the 2008 to 2009 growing season. The total forest seedlings produced in 2008 to 2009 was 1.01 billion seedlings. This is 5% (53.6 million) fewer seedlings than were produced in 2007 to 2008 (Tables 1, 2, 3, 4, and 11).

Table 4. Bareroot hardwood seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Cottonwood		Dogwood		Green ash		Oak		Others		Pecan		Sweetgum		Sycamore		Walnut		Yellow poplar		Total	
		%		%		%		%		%		%		%		%		%		%		%
Alabama	0	0	3	0	21	2	803	89	25	3	0	0	0	0	12	1	0	0	41	5	**905**	**3**
Arkansas	40	0	34	0	452	5	7,418	81	613	7	377	4	237	3	5	0	0	0	10	0	**9,186**	**32**
Florida	0	0	117	3	96	3	1,307	34	1,892	50	2	0	289	8	71	2	1	0	28	1	**3,803**	**13**
Georgia	0	0	34	1	72	3	2,012	79	423	17	12	0	0	0	5	0	0	0	5	0	**2,563**	**9**
Louisiana	45	2	0	0	60	3	1,500	69	437	20	50	2	67	3	20	1	10	0	0	0	**2,189**	**8**
Mississippi	0	0	0	0	12	1	1,000	96	0	0	11	1	0	0	0	0	0	0	15	1	**1,038**	**4**
North Carolina	0	0	50	6	30	4	375	45	285	34	0	0	3	0	20	2	40	5	30	4	**833**	**3**
Oklahoma	0	0	18	2	24	3	117	13	631	70	48	5	0	0	32	4	30	3	0	0	**900**	**3**
South Carolina	0	0	112	3	177	4	1,886	45	1,742	41	77	2	72	2	79	2	13	0	42	1	**4,200**	**15**
Tennessee	0	0	0	0	42	4	796	70	113	10	15	1	60	5	0	0	92	8	17	1	**1,135**	**4**
Texas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Virginia	0	0	130	6	80	4	440	21	1,377	65	0	0	0	0	64	3	30	1	2	0	**2,123**	**7**
Region	**85**	**0**	**498**	**2**	**1,066**	**4**	**17,654**	**61**	**7,538**	**26**	**592**	**2**	**728**	**3**	**308**	**1**	**216**	**1**	**190**	**1**	**28,875**	

*Percentage of state production
**Percentage of regional production

Table 5. Container hardwood seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Cottonwood		Dogwood		Green ash		Oak		Others		Pecan		Sweetgum		Sycamore		Walnut		Yellow poplar		Total	
		%		%		%		%		%		%		%		%		%		%		%
Alabama	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Arkansas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Florida	0	0	6	5	1	1	66	59	36	32	1	1	1	1	0	0	0	0	0	0	**111**	**35**
Georgia	0	0	0	0	0	0	80	41	0	0	0	0	116	59	0	0	0	0	0	0	**196**	**61**
Louisiana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
North Carolina	0	0	0	0	0	0	2	50	2	50	0	0	0	0	0	0	0	0	0	0	**4**	**1**
Oklahoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
Texas	0	0	0	0	4	40	6	60	0	0	0	0	0	0	0	0	0	0	0	0	**10**	**3**
Virginia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Region	**0**	**0**	**6**	**2**	**5**	**2**	**154**	**48**	**38**	**12**	**1**	**0**	**117**	**36**	**0**	**0**	**0**	**0**	**0**	**0**	**321**	

*Percentage of state production
**Percentage of regional production

Table 6. Hardwood seedling production by state for the 2008 to 2009 planting season across the southern US for various species (in thousands).

State	Cottonwood		Dogwood		Green ash		Oak		Others		Pecan		Sweetgum		Sycamore		Walnut		Yellow poplar		Total	
		%		%		%		%		%		%		%		%		%		%		%
Alabama	0	0	3	0	21	2	803	89	25	3	0	0	0	0	12	1	0	0	41	5	**905**	**3**
Arkansas	40	0	34	0	452	5	7,418	81	613	7	377	4	237	3	5	0	0	0	10	0	**9,186**	**31**
Florida	0	0	123	3	97	2	1,373	35	1,928	49	3	0	290	7	71	2	1	0	28	1	**3,914**	**13**
Georgia	0	0	34	1	72	3	2,092	76	423	15	12	0	116	4	5	0	0	0	5	0	**2,759**	**9**
Louisiana	45	2	0	0	60	3	1,500	69	437	20	50	2	67	3	20	1	10	0	0	0	**2,189**	**7**
Mississippi	0	0	0	0	12	1	1,000	96	0	0	11	1	0	0	0	0	0	0	15	1	**1,038**	**4**
North Carolina	0	0	50	6	30	4	377	45	287	34	0	0	3	0	20	2	40	5	30	4	**837**	**3**
Oklahoma	0	0	18	2	24	3	117	13	631	70	48	5	0	0	32	4	30	3	0	0	**900**	**3**
South Carolina	0	0	112	3	177	4	1,886	45	1,742	41	77	2	72	2	79	2	13	0	42	1	**4,200**	**14**
Tennessee	0	0	0	0	42	4	796	70	113	10	15	1	60	5	0	0	92	8	17	1	**1,135**	**4**
Texas	0	0	0	0	4	40	6	60	0	0	0	0	0	0	0	0	0	0	0	0	**10**	**0**
Virginia	0	0	130	6	80	4	440	21	1,377	65	0	0	0	0	64	3	30	1	2	0	**2,123**	**7**
Region	**85**	**0**	**504**	**2**	**1,071**	**4**	**17,808**	**61**	**7,576**	**26**	**593**	**2**	**845**	**3**	**308**	**1**	**216**	**1**	**190**	**1**	29,196	

*Percentage of state production
**Percentage of regional production

Table 7. Species production for the 2008 to 2009 planting season across the southern US by ownership category (in thousands). Private = nurseries owned by companies or individuals that do not own wood processing facilities; Industry = nurseries owned by companies that have wood processing facilities; BR = bareroot; C= container.

Type	Species	State		Private		Industry		Total
			%*		%*		%*	
BR	Baldcypress	1,071	35	1,697	55	295	10	**3,063**
	Fraser fir	744	100	0	0	0	0	**744**
	Loblolly	68,877	9	325,409	44	346,640	47	**740,926**
	Longleaf	5,710	59	3,751	39	227	2	**9,688**
	Others	1,250	49	1,320	51	0	0	**2,570**
	Sand	223	16	1,150	84	0	0	**1,373**
	Shortleaf	1,338	100	0	0	0	0	**1,338**
	Slash	19,434	22	56,367	64	11,598	13	**87,399**
	Virginia	783	50	778	50	0	0	**1,561**
	White	2,345	100	0	0	0	0	**2,345**
	Total	**101,775**	**12**	**390,472**	**46**	**358,760**	**42**	**851,007**
C	Baldcypress	0	0	104	100	0	0	**104**
	Fraser fir	160	100	0	0	0	0	**160**
	Loblolly	408	1	36,899	82	7,888	17	**45,195**
	Longleaf	7,020	10	58,706	81	7,413	10	**73,139**
	Others	1,225	87	187	13	0	0	**1,412**
	Sand	15	43	20	57	0	0	**35**
	Shortleaf	0	0	825	100	0	0	**825**
	Slash	600	16	3,211	84	0	0	**3,811**
	Virginia	1	6	15	94	0	0	**16**
	White	0	0	0	0	0	0	**0**
	Total	**9,429**	**8**	**99,967**	**80**	**15,301**	**12**	**124,697**
BR	Cottonwood	45	53	40	47		0	**85**
	Dogwood	228	46	267	54	3	1	**498**
	Green ash	454	43	586	55	26	2	**1,066**
	Oak	8,013	45	6,686	38	2,955	17	**17,654**
	Others	3,101	41	4,387	58	50	1	**7,538**
	Pecan	365	62	197	33	30	5	**592**
	Sweetgum	142	20	586	80	0	0	**728**
	Sycamore	157	51	139	45	12	4	**308**
	Walnut	206	95	10	5	0	0	**216**
	Yel. Poplar	62	33	109	57	19	10	**190**
	Total	**12,773**	**44**	**13,007**	**45**	**3,095**	**11**	**28,875**
C	Cottonwood	0	0	0	0	0	0	
	Dogwood	0	0	6	100	0	0	**6**
	Green ash	0	0	5	100	0	0	**5**
	Oak	2	1	152	99	0	0	**154**
	Others	2	5	36	95	0	0	**38**
	Pecan	0	0	1	100	0	0	**1**
	Sweetgum	0	0	117	100	0	0	**117**
	Sycamore	0	0	0	0	0	0	**0**
	Walnut	0	0	0	0	0	0	**0**
	Yellow Poplar	0	0	0	0	0	0	**0**
	Total	**4**	**1**	**317**	**99**	**0**	**0**	**321**
All	**Region**	**123,981**	**12**	**503,763**	**50**	**377,156**	**38**	**1,004,900**

*Percentage of species production for that ownership class

Table 8. Conifer seedling production for the 2008 to 2009 planting season across the southern US by ownership category (in thousands). Private = nurseries owned by companies or individuals that do not own wood processing facilities; Industry = nurseries owned by companies that have wood processing facilities. Percentages are calculated for each stocktype within a state.

	Bareroot conifer						Container conifer						Conifer seedling production						
State	State	%	Private	%	Industry	%	State	%	Private	%	Industry	%	State	%	Private	%	Industry	%	Total
Alabama	0	0	60,245	45	68,968	52	0	0	105	0	3881	3	0	0	60,350	45	72,849	55	**133,199**
Arkansas	6,450	6	44,587	42	55,106	52	0	0	0	0	0	0	6,450	6	44,587	42	55,106	52	**106,143**
Florida	10,415	21	24,426	48	0	0	4,665	9	6,740	22	0	0	15,080	30	31,166	70	0	0	**46,246**
Georgia	13,883	6	119,786	52	5,130	2	0	0	93,121	40	0	0	13,883	6	212,907	92	5,130	2	**231,920**
Louisiana	24,609	100	0	0	0	0	0	0	0	0	0	0	24,609	100	0	0	0	0	**24,609**
Mississippi	0	0	0	0	87,219	95	0	0	0	0	4220	5	0	0	0	0	91,439	100	**91,439**
North Carolina	8,459	15	0	0	42,000	72	3,830	7	0	0	7200	7	12,289	21	0	0	49,200	79	**61,489**
Oklahoma	5,041	100	0	0	0	0	8	0	0	0	0	0	5,049	100	0	0	0	0	**5,049**
South Carolina	4,772	3	39,634	27	100,337	69	926	1	0	0	0	0	5,698	4	39,634	27	100,337	69	**145,669**
Tennessee	4,781	100	0	0	0	0	0	0	0	0	0	0	4,781	100	0	0	0	0	**4,781**
Texas	0	0	101,794	100	0	0	0	0	1	0	0	0	0	0	101,795	100	0	0	**101,795**
Virginia	23,365	100	0	0	0	0	0	0	0	0	0	0	23,365	100	0	0	0	0	**23,365**
Region	**101,775**	**10**	**390,472**	**40**	**358,760**	**37**	**9,429**	**1**	**99,967**	**11**	**15,301**	**1**	**111,204**	**11**	**490,439**	**51**	**374,061**	**38**	**975,704**

Table 9. Hardwood seedling production for the 2008 to 2009 planting season across the southern US by ownership category (in thousands). Private = nurseries owned by companies or individuals that do not own wood processing facilities; Industry = nurseries owned by companies that have wood processing facilities. Percentages are calculated for each stocktype within a state.

	Bareroot hardwood						Container hardwood						Hardwood seedling production						
State	**State**	**%**	**Private**	**%**	**Industry**	**%**	**State**	**%**	**Private**	**%**	**Industry**	**%**	**State**	**%**	**Private**	**%**	**Industry**	**%**	**Total**
Alabama	0	0	681	75	224	25	0	0	0	0	0	0	0	0	681	75	224	25	**905**
Arkansas	4,655	51	2,698	29	1,833	20	0	0	0	0	0	0	4,655	51	2,698	29	1,833	20	**9,186**
Florida	0	0	3,803	97	0	0	0	0	111	3	0	0	0	0	3,914	100	0	0	**3,914**
Georgia	728	26	1,835	67	0	0	0	0	196	7	0	0	728	26	2,031	74	0	0	**2,759**
Louisiana	2,189	100	0	0	0	0	0	0	0	0	0	0	2,189	100	0	0	0	0	**2,189**
Mississippi	0	0	0	0	1,038	100	0	0	0	0	0	0	0	0	0	0	1,038	100	**1,038**
North Carolina	833	100	0	0	0	0	4	0	0	0	0	0	837	100	0	0	0	0	**837**
Oklahoma	900	100	0	0	0	0	0	0	0	0	0	0	900	100	0	0	0	0	**900**
South Carolina	210	5	3,990	95	0	0	0	0	0	0	0	0	210	5	3,990	95	0	0	**4,200**
Tennessee	1,135	100	0	0	0	0	0	0	0	0	0	0	1,135	100	0	0	0	0	**1,135**
Texas	0	0	0	0	0	0	0	0	10	100	0	0	0	0	10	100	0	0	**10**
Virginia	2,123	100	0	0	0	0	0	0	0	0	0	0	2,123	100	0	0	0	0	**2,123**
Region	**12,773**	**44**	**13,007**	**45**	**3,095**	**11**	**4**	**0**	**317**	**1**	**0**	**0**	**12,777**	**44**	**13,324**	**46**	**3,095**	**11**	**29,196**

Table 10. Seedling production for the 2008 to 2009 planting season across the southern US by ownership category (in thousands). Private = nurseries owned by companies or individuals that do not own wood processing facilities; Industry = nurseries owned by companies that have wood processing facilities.

	Total seedling production							
State	**State**	**%***	**Private**	**%***	**Industry**	**%***	**Total**	**%****
Alabama	0	0	61,031	46	73,073	54	134,104	13
Arkansas	11,105	10	47,285	41	56,939	49	115,329	11
Florida	15,080	30	35,080	70	0	0	50,160	5
Georgia	14,611	6	214,938	92	5,130	2	234,679	23
Louisiana	26,798	100	0	0	0	0	26,798	3
Mississippi	0	0	0	0	92,477	100	92,477	9
North Carolina	13,126	21	0	0	49,200	79	62,326	6
Oklahoma	5,949	100	0	0	0	0	5,949	1
South Carolina	5,908	4	43,624	29	100,337	67	149,869	15
Tennessee	5,916	100	0	0	0	0	5,916	1
Texas	0	0	101,805	100	0	0	101,805	10
Virginia	25,488	100	0	0	0	0	25,488	3
Region	**123,981**	**12**	**503,763**	**50**	**377,156**	**38**	**1,004,900**	

*Percentage of state production
**Percentage of regional production

Table 11. Change in seedling production from the 2005 to 2006 nursery season to the 2008 to 2009 season (in thousands).

State	2008 to 2009 Production	Rank	% Change from previous year	2007 to 2008 Production	Rank	% Change from previous year	2006 to 2007 Production	Rank	% Change from previous year	2005 to 2006 Production	Rank	% Change from previous year
Alabama	134,104	3	-0	134,693	3	-9	147,435	2	-3	152,365	3	-13
Arkansas	115,329	4	-2	117,366	4	9	107,425	5	-5	112,876	5	10
Florida	50,160	8	39	36,206	8	-38	58,202	8	4	56,199	8	-4
Georgia	234,679	1	-5	248,143	1	-4	257,481	1	36	188,826	1	-30
Louisiana	26,798	9	1	26,515	10	-21	33,600	10	-2	34,128	10	-14
Mississippi	92,477	6	-12	104,902	5	13	92,927	6	-6	98,444	6	-12
North Carolina	62,326	7	-9	68,075	7	-12	77,162	7	12	68,740	7	-2
Oklahoma	5,949	11	-5	6,286	11	-3	6,470	11	282	1,694	12	-33
South Carolina	149,869	2	-14	175,102	2	21	145,036	3	-12	164,949	2	-2
Tennessee	5,916	12	1	5,877	12	11	5,305	12	-24	6,980	11	-47
Texas	101,805	5	1	100,461	6	-13	115,865	4	-2	118,141	4	-1
Virginia	25,488	10	-26	34,646	9	-12	39,507	9	3	38,304	9	14
Total	**1,004,900**		**-5**	**1,058,271**		**-3**	**1,086,415**		**4**	**1,041,646**		**-11**

Historical Seedling Production Trends

The combined data for seedling production in the southern US are shown in Figure 1. After a stagnant level of seedling production and the effects of World War II, some of the more interesting points within the graph begin in 1955 when approximately 202,000 ha (500,000 ac) were planted across the 12 states in the southern US. Seedling outplanting increased steadily to 0.7 million ha (1.7 million ac), mostly due to the Soil Bank Program that started in 1957 and ended in 1960. From the early 1960s to the 1980s, seedling production climbed rapidly, peaking in the late 1980s with 1.1 million ha (2.7 million ac) planted in either conifer or hardwood seedlings. While the forest industry had a large part in the upward trend, the large peak was mostly due to the Conservation Reserve Program that tapped into non-industrial private landowners who were converting agricultural land to forest plantations. During the following 5 years (until 1995), seedling production and outplanting decreased rapidly, when only 0.7 million ha (1.7 million ac) were planted. There was a sharp spike and increase in 2001, when approximately 0.9 million ha (2.2 million ac) were planted. This third peak in seedling outplanting was due to cost-share programs such as the Conservation Reserve Program on longleaf pine. Seedling production and outplanting, however, has steadily decreased to 405,000 ha (1 million ac) in 2009 at levels not seen since the mid-1970s.

Nursery Contraction

With help from SFNMC members, data has been gathered on the number of nursery closures as well as the amount of land area taken out of seedling production. However, because many smaller nurseries escape detection, this dataset is not complete. Since 1995, through mergers, shuttering, and cessation of state reforestation programs, at least 25 nurseries have closed in the 12 southern states (Figure 2). By estimating nursery size and historical production at each of those nurseries, the capacity loss is calculated at 579 million seedlings. Yet much of this reduction in capacity was offset by nurseries coming online (for example, Plum Creek Timber Company, Pearl River Nursery, Hazlehurst, MS) and increasing capacity at nurseries still in operation. While the overall effect of seedling production may be minimal, certainly there are many fewer nurseries in operation in 2009 than in 1995.

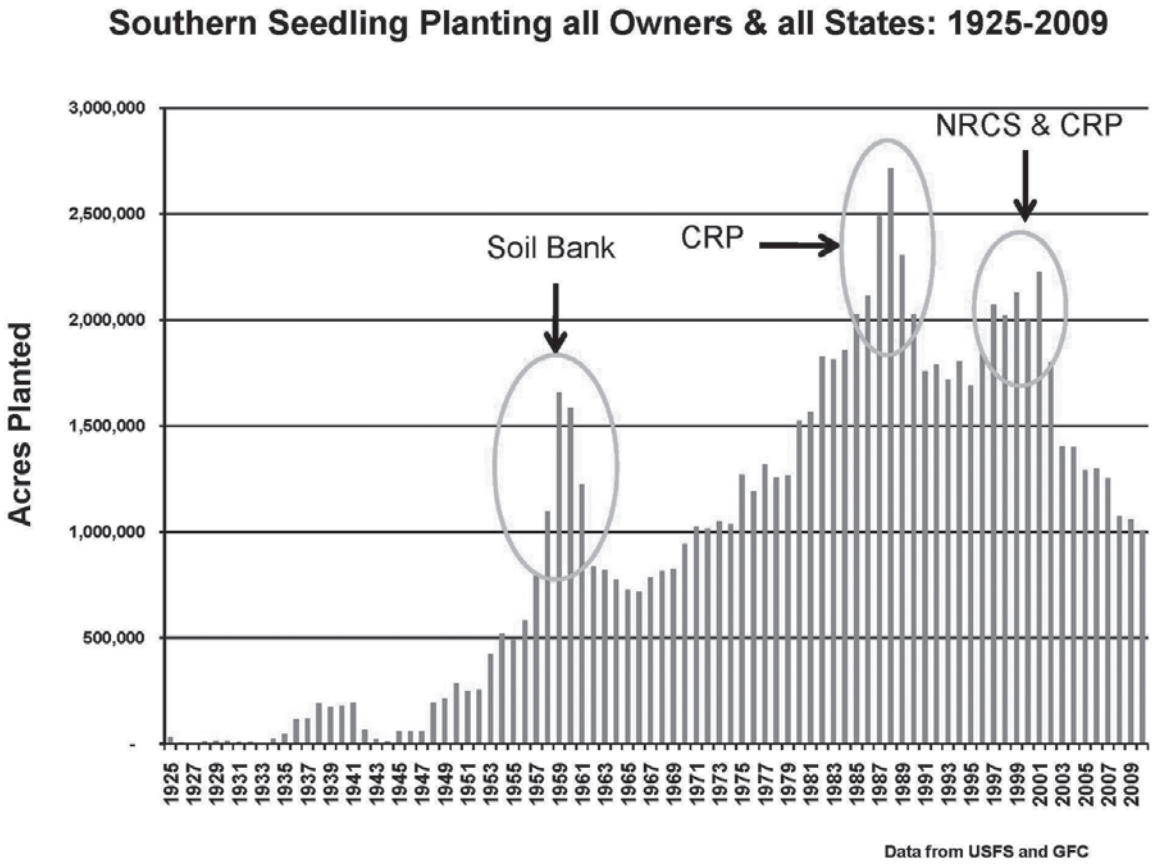

Figure 1. Historical outplanting trends in the southern US for all forest land owners and all states from 1925 to 2009.

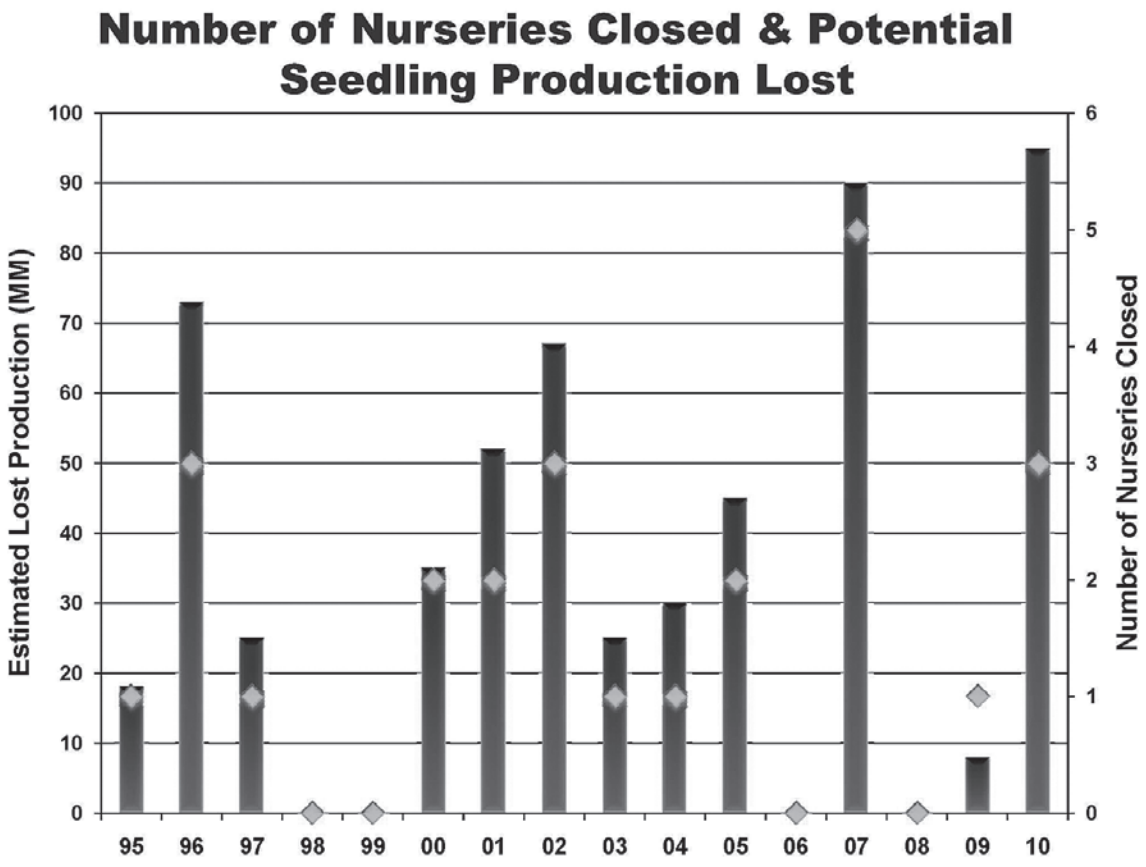

Figure 2. Forest seedling nurseries closed and potential production area lost since 1995.

Discussion

One of the shortcomings of this particular survey tool is that the numbers reported do not necessarily translate into acres planted within either the state or land-ownership category. Data is collected as production, so any information on actual seedling sales or seedlings outplanted by state or land-ownership category is simply not available. What these numbers do provide is a fairly good estimate of seedlings (species, planting stock, and so on) that probably were outplanted by non-industrial land-owners, forest industry, or real estate investment trusts during the 2008 to 2009 planting season. A simple estimate of the area planted across the region could be made by dividing the number of seedlings produced by 1480 seedlings/ha (600 seedlings/ac) for a total of 0.7 million ha (1.7 million ac) planted. While this figure is close to the area reported in Moulton (1999), it is about 18.7% less than what was reported for the 1997 season (Moulton and Hernandez 1999). With about 264 million fewer seedlings produced in 2009 than 1997, one could infer a corresponding decrease in area planted across the region over the past 12 years (Figure 3). At 1480 seedlings/ha (600 seedlings/ac), it could be inferred that approximately 178,000 fewer ha (440,000 fewer ac) were replanted across the region in 2009 than were planted in 1997.

Acknowledgments

The author thanks member and non-member nurseries for sharing their seedling production information with the Southern Forest Nursery Management Cooperative, and Elizabeth Bowersock for her efforts in conducting and compiling the survey data.

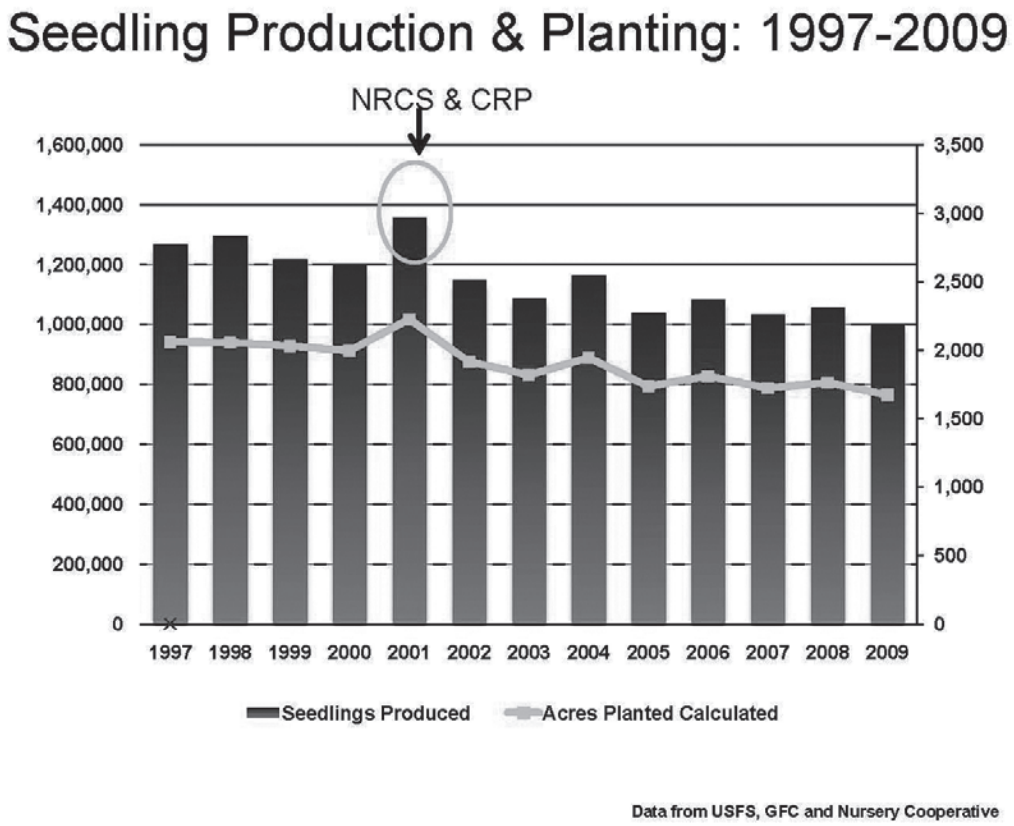

Figure 3. Seedling production and acres planted in the southern United States from 1997 to 2009 (1 ac = 0.41 ha).

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