

Costs & Trends of Southern Forestry Practices, 2016

► When making forestland management decisions, landowners are often concerned with the cost of forestry practices. They may worry that they cannot afford to complete activities such as planting or understory control, so they choose to do nothing. Knowing even a range of costs for forestry practices can help in the decision making process and may lead to better forest management.

This report summarizes the results of a 2016 survey to examine the costs of forestry practices across the southeastern United States. Three physiographic regions in the South were considered: Southern Coastal Plain, Northern Coastal Plain, and Piedmont regions (fig. 1). The results are based on 76 usable responses. Of those, 42 percent were from private family landowners, 7 percent were from publicly funded organizations, 26 percent were from consulting firms, 12 percent were from private forestry firms, and 8 percent of respondents reported “other” as their organization type. Results are adapted from the “2016 Cost and Cost Trends” Special Report in the September/October 2017 edition of *Forest Landowner* magazine.



Results

Mechanical Site Preparation

Mechanical site preparation was reported on 75,152 acres at an average cost per acre of \$140.99 (table 1). This activity included practices such as shear-rake-pile-bed, subsoiling, and drum chopping. The majority of acres reported were single pass operations, which were 51 percent less than double pass operations and 58 percent less than triple pass operations.

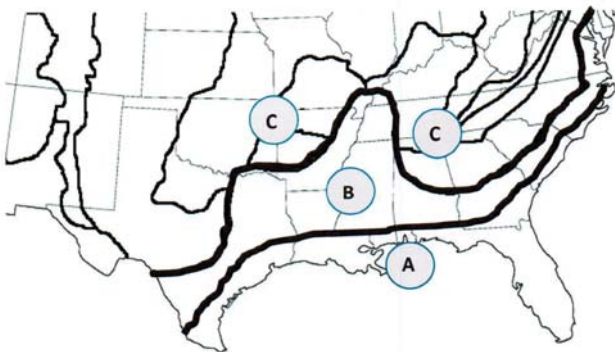


Figure 1. Physiological regions in the South that was used in the 2016 Cost of Forestry Practices survey showing (A) Southern Coastal Plain, (B) Northern Coastal Plain, and (C) Piedmont or similar uplands.

Planting

Pine seedlings were reported as planted most often in 2016, for a total of 236,783 acres (table 2). The majority of respondents (76 percent) reported hand planting and 24 percent reported machine planting. Most of the pine seedlings planted were bareroot loblolly pine (*Pinus taeda*), which made up 85 percent of the total acres reported.

Pine seedlings averaged 582 per acre for hand planting and about 600 per acre for machine planting (table 2). The average cost of machine planting bareroot pine species on cutover land was 33 percent higher than the average cost of hand planting all bareroot pine seedlings on similar sites.

Prescribed Burning

Fifty-four percent of survey respondents reported prescribed burning in 2016. A ground drip torch was used in all cases for a total of 60,305 acres at an average cost per acre of \$26.63 (table 3). Regional differences in costs were reported. In general, prescribed burning practices reported in the Piedmont were more expensive than those reported in other regions.

Table 1. Mechanical Site Preparation Costs Per Acre

Site Preparation Treatment	Number of Passes	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
			Average Cost Per Acre			
All	All	75,152	103.40	164.33	160.76	140.99
All	1	33,499	*	*	*	105.73
All	2	17,691	*	*	*	217.87
All	3	9,355	*	*	*	252.09

* Too few responses.

Table 2. Hand and Machine Planting Costs Per Acre and Purchase Cost Per Seedling

Planting Method	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average	Average Purchase Cost Per Seedling	Overall Average Seedlings Per Acre
		Average cost per acre					
Hand Planting							
Cutover land, all pine, bareroot	55,973	54.47	67.10	56.46	59.34	0.08	585
Cutover land, all pine, container	3,032	53.66	94.79	*	72.29	0.17	605
All land type, loblolly pine, bareroot	136,203	*	*	*	55.60	0.08	581
All land type, loblolly pine, container	4,064	*	*	*	65.10	0.14	582
All land type, slash pine, bareroot	2,104	*	*	*	52.10	0.06	609
All land type, longleaf pine, container	3,994	*	*	*	63.20	0.20	572
All hand methods, all pine	154,995	*	*	*	60.41	0.12	582
Machine Planting							
Cutover land, all pine, bareroot	37,318	68.48	86.80	112.00	89.09	0.08	598
All land type, loblolly pine, bareroot	65,113	*	*	*	86.80	0.08	576
All land type, slash pine, bareroot	9,995	*	*	*	61.70	0.06	643
All machine methods, all pine	81,788	*	*	*	83.62	0.09	603

* Too few responses. Overall planting costs per acre do not include seedling cost.

Table 3. Prescribed Burning Treatment Costs Per Acre by Ignition Type and Burning Purpose

Ignition Type	Burning purpose	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall average
			Average cost per acre			
Ground, drip torch	Site preparation	23,846	25.10	22.74	35.83	28.94
Ground, drip torch	Understory control	31,328	14.00	28.32	24.22	23.61
Ground, drip torch	All	60,305	18.12	25.60	29.40	26.63

Chemical Application

Chemical applications were reported by almost 80 percent of respondents who treated 455,738 acres in 2016 (table 4). Site preparation, midrotation release, and herbaceous weed control were the top reasons for treatment with the majority of acres (53 percent) treated as part of site preparation activities. Seventy-one percent of acres treated were aerially sprayed. Overall, aerial application methods were less expensive than were ground application methods. Additionally, average cost per acre averaged higher in the Piedmont than in other regions.

Fertilization

Less than a quarter (21 percent) of respondents reported using fertilizer as a forestry practice. They reported treating 185,750 acres at an average cost of \$70.41 per acre (table 5). Aerial application of fertilizer accounted for 90 percent of all fertilization treatments reported in 2016. Aerial applications of a blend of Diammonium Phosphate (DAP) and Urea were most common.

Fire Protection

Although more than 26.7 million acres were reported to be using fire protection methods of some kind in 2016, less than one-quarter of respondents (22 percent) reported the practice (table 6). Protection methods reported included firebreaks, fire plows, and tractors.

Timber Cruising and Marking

Timber cruising was reported by 41 percent of survey respondents. The majority of respondents (67 percent) reported using variable radius plots at an overall average cost of \$11.32 per acre (table 7). The majority (88 percent) of the 5,958 acres of marked timber operations reported were completed before thinning operations. Only 22 percent of respondents reported completing any type of marking activity on their lands.

Precommercial Thinning

Precommercial thinning is often completed early in a rotation and when trees may be in an overcrowded condition. For the 2016 survey, 14 percent of survey respondents reported precommercial thinning on 9,846 acres (table 9).

Custodial Management

Custodial management costs may include activities such as road construction and maintenance, boundary line maintenance or surveys, insect and disease management, or legal fees. Just more than half (51 percent) of respondents reported custodial management activities. Road construction and maintenance accounted for 45 percent of all acres reported in 2016 (table 10). Average cost per acre for all operation types was greatest for the Northern Coastal Plain region.

Table 4. Chemical Application Costs Per Acre by Treatment Purpose and Method of Application

Treatment Purpose	Method of Application	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall average
			Average cost per acre			
Site preparation	Ground	19,903	77.56	71.74	*	78.47
Site preparation	Aerial	185,433	*	78.27	*	79.70
Site preparation	All	240,286	77.66	75.60	85.53	78.96
Midrotation release	Ground	22,267	*	*	*	70.37
Midrotation release	Aerial	78,640	*	*	*	53.40
Midrotation release	All	100,907	*	61.48	*	62.12
Herbaceous weed control	Ground	22,442	*	*	*	57.11
Herbaceous weed control	Aerial	60,933	*	*	*	44.14
Herbaceous weed control	All	96,963	*	37.76	*	50.59
All	Ground	64,612	*	*	*	68.65
All	Aerial	325,006	*	*	*	59.08
All	All	455,738	67.10	67.77	73.93	69.53

* Too few responses.

Table 5. Fertilization Costs Per Acre by Purpose of Application, Application Method, and Fertilizer Type

Purpose of Application	Application Method	Fertilizer Type	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
				Average Cost Per Acre			
All	Ground	DAP	5,661	*	*	*	50.21
All	Aerial	DAP	42,472	*	*	*	49.22
All	All	DAP	48,133	*	*	*	49.53
All	Aerial	DAP+Urea	125,831	*	*	*	97.03
All	Ground	All	11,947	*	*	*	63.16
All	Aerial	All	167,803	*	*	*	71.68
All	All	All	185,750	*	*	*	70.41

* Too few responses.

Table 6. Fire Protection Costs Per Acre

Primary Method of Fire Protection	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
		Average Cost Per Acre			
All	26,708,703	4.96	*	*	17.56

* Too few responses.

Table 7. Timber Cruising Costs Per Acre by Inventory Purpose and Method Used

Inventory Purpose	Method Used	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
			Average cost per acre			
All	Fixed plot	281,181	*	*	*	10.84
All	Variable radius	645,163	*	*	*	11.32
All	All	953,825	8.85	9.94	9.62	10.64

* Too few responses.

Table 8. Timber Marking Costs Per Acre

Timber Marking Purpose	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
		Average Cost Per Acre			
Thinning	5,224	*	*	28.63	33.77
All	5,958	*	*	*	29.25

* Too few responses.

Table 9. Precommercial Thinning Costs Per Acre

Primary Thinning Method	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall average
		Average Cost Per Acre			
All	9,846	*	*	*	159.44

* Too few responses.

Table 10. Custodial Management Costs Per Acre by Operation Type

Operation Type	Acres	Southern Coastal Plain	Northern Coastal Plain	Piedmont	Overall Average
		Average Cost Per Acre			
Boundary line maintenance	1,404,002	*	*	*	1.36
Road construction/maintenance	2,099,798	*	*	*	2.40
All	4,676,097	4.98	7.00	3.00	10.15

* Too few responses.

Changes in Costs Estimates

When comparing 2016 to 2012 averages, the majority of costs decreased except for chemical applications and hand planting (fig. 2A). Comparisons to 2014 averages show that most costs increased except for timber marking, machine planting, and fertilization (fig. 2B).

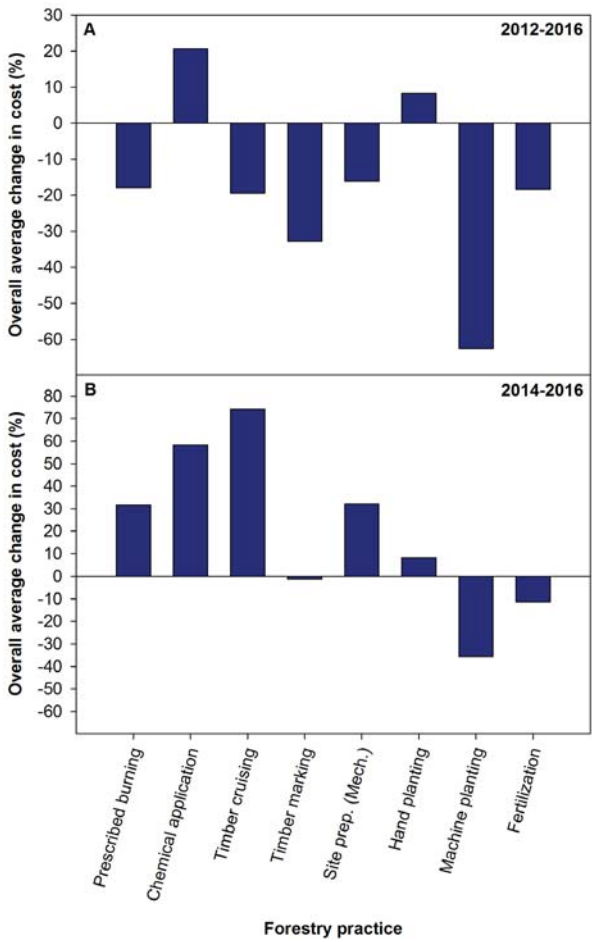


Figure 2. Percent change in costs of forestry practices (A) from 2012 to 2016 and (B) from 2014 to 2016.

Summary

Forestry practice costs in the South have been more variable in the last ten years than they were in past decades. This is due, in part, to the fact that the forest industry has been affected during much of this time by depressed housing markets, timber demand, and stumpage prices. Another factor influencing costs of forestry practices is financial pressure on corporate forest products companies. This pressure caused many companies to transition to Timber Investment Management Organizations (TIMO) or Real Estate Investment Trusts (REIT) or to divest of timberland completely. In addition, the low stumpage prices during this time likely influenced decisions of landowners and managers that may have played a role in the variability of forestry practices costs.



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