Intensive Pine Straw Management on Post CRP Pine Stands

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Introduction

Across Southeast Georgia, thousands of landowners are faced with the decision of how to effectively manage post Conservation Reserve Program (CRP) pine stands. As the income from CRP contracts ends, many landowners with slash and longleaf pine stands are attracted to pine straw production to provide revenue in the mid-rotation years of the harvest cycle. Wheeler County has historically been a hub of pine straw production in Georgia. A study was designed to evaluate the impact of intensive management practices on pine straw production in Wheeler County.

Photo 1. Typical old-field slash pine stand intensively managed for straw during harvest in Wheeler County.

Situation

Six slash pine fields totaling 60 acres were evaluated for pine straw production following a CRP contract. The soil series for these stands were predominantly Fuquay, Cowarts, Lakeland, Troup and Tifton. Trees were planted in 1991. Stands 1, 2, 3, and 6 were planted at a 6' x 10' spacing (726 trees per acre), and stands 4 and 5 were planted at a 6' x 9' spacing (807 trees per acre). Two years prior to the end of the contract (October 1997), the landowner initiated spot herbicide treatments to control briars and selected hardwood trees within the stands. In order to improve access to the area, a custom operator was hired to commercially mow the pine stands in October 1997 and again in October 1998. In the spring of 1999, the landowner initiated treatments around the perimeters of all six pine stands to prevent encroachment of undesirable hardwood competition. Frilling and spraying was used for hardwood trees with a diameter greater than 4 inches. Basal herbicide treatments were applied to the smaller hardwood stems around the perimeters. In June of 1999, a boomless sprayer was utilized to apply a herbaceous weed control treatment. The early herbicide treatments allowed the landowner to harvest a higher percentage of the acreage. One large hardwood tree can prohibit the raking on up to 1/10 acre of land. The CRP contract ended in September 1999. Soil test phosphorus levels were analyzed in February 2001, and all stands had 47-105 pounds per acre available at that time. These phosphorus levels were well above the minimum required for optimum growth.

Results

The first pine straw harvest was in October 1999. Harvesting pine straw once or twice a year opens up the forest floor for weed seed to make soil-to-seed contact. It also eliminates most of the mulch layer over time. This allows sunlight to help more weeds germinate. Annual herbicide treatments were utilized to control herbaceous weeds following raking. This intensive practice is critical to maximize pine straw production. Large wood debris from dead trees was removed to maintain access into the stands. Pine straw harvest data was documented by the landowner from October 1999 through April 2008. A total of 17 pine straw harvests were conducted over the 9-year period. A total of 2,147 bales/acre were harvested during this period with an average of 238 bales/acre per year **(Table 1)**. Using an average bale price of $0.65, this equals $154.70/acre per year with intensive management. In

Georgia, the average value of pine straw is estimated at $100/acre per year according to the "2006 Georgia Farm Gate Value Report".

Table 1. Pine Straw Harvest Data

Year	Bales Raked *(bales/acre)*
1999	*94
2000	204
2001	172
2002	227
2003	223
2004	385
2005	*148
2006	339
2007	241
2008	*114
Total	2,147
Average per year	238

* Only one raking per year was conducted.

Landowners are also faced with the important decision when to thin the pine stands to maintain forest health and vigor. This effectively stops pine straw production for at least two years. Thinned pine stands are less attractive to pine straw production companies. In some cases the pine straw harvest ends at first thinning.

In September 2006, the pine tree stands were measured for growth. Twenty-two sample plots were measured across the stands. Parameters of interest included trees per acre, basal area per acre, live crown ratio, average diameter, average merchantable height, defect rates and types and 5-year average radial growth.

A careful analysis of the stand parameters was done to compare the current short-term pine straw revenue with the long-term potential from multiple tree harvests. Stand data, presented in **Table 2,** indicated that stand number 1 was still growing well but was past the optimum thinning time based on the basal area and trees per acre measurements. Stands 2 and 3 had acceptable growth measurements but had a moderate amount of stand loss primarily in the small diameter tree categories. Stands 2 and 3 needed thinning based on the basal area measurements of 136 and 120 respectively. Stands 4 and 5 had significant tree loss of all diameter classes due to overcrowding. Stands 4 and 5 also had the smallest diameter trees.

Stand 6 had slowed down from an optimum growth range to a moderate growth rate. Stand 6 needed thinning based on basal area measurements.

Table 2. Stand Growth Parameters for unthinned old-field pine stands in Wheeler County, GA (age 16 yrs-old at time of measurements in September 2006).

Stand	Trees Per Acre	Basal Area Per Acre	Diameter	Height	Live Crown Ratio
		(ft^2)	*(in)*	*(ft)*	*(%)*
1	502	165	7.9	57	37
2	382	136	8.1	55	43
3	329	120	8.2	53	45
4	328	93	7.4	51	35
5	454	123	7.0	51	41
6	383	120	7.6	55	41

These CRP stands are indicative of pine straw stands and conditions landowners may face. Structurally, stands 4 and 5 are to the point at which thinning may not promote active, vigorous growth. The residual trees, after a thinning, may not justify maintaining the stand.

Stands 1, 2, 3 and 6 are at the point that a thinning is necessary to prevent a significant loss of trees. These stands, when thinned, will have the potential to remain healthy, productive stands.

Summary

Based on pine straw harvest data over a nine-year period, it is apparent that in this case, intensive management increased pine straw production substantially over the state production average.

Data gathered during September 2006 indicated that four of the pine stands were slowing in productivity and two were experiencing significant mortality. These stands have reached a critical point at which present yields from pine straw production, while still feasible, the revenue from pine straw production does not equal the degradation to the timber quality. It is apparent in this example that the intensive management that increased the pine straw production can go only so far. When the slash pine stands became biologically mature, productivity declined dramatically.

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LITERATURE CITED

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