ABSTRACT

Investments in thinned longleaf pine (Pinus palustris Mill.) plantations are financially profitable based upon analysis of data gathered from Louisiana, Mississippi, and Texas. Site quality is a key determinate of results.

INTRODUCTION

Longleaf pine (Pinus palustris Mill.) once dominated the Southern pine landscape but acreage in longleaf stands have declined for many years. One major reason given for the decline has been the assumed poor economic returns from longleaf pine management. These perceptions were fueled by early difficulties in stand regeneration and excessive time the tree spends in the grass stage. Today, these difficulties have lessened, and it is appropriate to reexamine the financial returns of longleaf pine management.

METHODS

Individual tree data from 94 stands aged 40 yrs. (Mississippi), 45 yrs. (Texas), and 50 yrs. (Louisiana) were analyzed. The stands were originally planted with up to 2,500 trees/acre. Each stand experienced excessive mortality in stand establishment but were fully stocked by age 20. Given modern planting techniques, it was assumed plantings of only 726 trees/acre would be required to achieve the same survival. Stands were either left unthinned or were periodically thinned to target basal areas of 40, 60, 80, 100, 120, or 140 ft²/acre, respectively, beginning at age 20. Final harvests were assumed to occur at ages 25 to 50. Land expectation values (LEV) were calculated for each regime using a 5% real discount rate, and the LEV at the optimal final harvest age was used for comparisons. Costs and returns were assumed to change at the same rate as inflation.

Regional average stumpage prices from 1993 to 1996 were compiled as follows: poles and sawtimber, $388 and $274/MBF, Scribner, respectively; and chip-n-saw and pulpwood, $61 and $24/cord. Stand establishment costs of $148/acre were assumed to mimic the light site preparation treatment and plantings of the modeled stands. Other costs were assumed to be 10% of harvest revenues. Income tax rates were assumed to be 28% and 4% at the federal and state level, respectively. Property taxes were assumed to be $1.70/acre/yr.

A computer model was developed to simulate the merchandising of each harvested tree. Dynamic programming subroutines used a longleaf taper function developed previously from this data set.

RESULTS AND CONCLUSIONS

Optimal after-tax LEVs averaged $545/acre, with a range of $300 to $800/acre. The corresponding internal rate of return (IRR) averaged slightly over 10 percent, with values ranging from 8 percent to 12 percent.

The combination of thinning every 5 years and the production of high-valued poles allowed fairly long rotations to be economically efficient in the analysis. The average optimal rotation age was 40 years. Site quality was a key determinate of stand value; the higher the site index, the larger the LEV, and the lower the site index, the lower the LEV.

Longleaf may be the best kept financial secret in Southern forestry. Conservative analyses show decent after-tax financial returns for longleaf management. Missing from these calculations are gains from intensive management such as intensive site preparation and fertilization, intensive utilization of the resource through pine straw harvesting, and the many highly-valued ecological values present in a thriving longleaf pine ecosystem.
Figure 1.—Summary of key data on investments longleaf pine plantations.