Reprinted from: Thinning Southern Pine Plantations: Integrating Economics and Biology. (March 1980, Long Beach, Miss.) p. 105-116. Southern Forest Economics Workers. (1980).

LABOR FOR THINNING--TRENDS AND PROSPECTS

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The labor supply for timber harvesting has been a chronic issue for the southern pulp and paper industry since the mid-1950s. Whenever woodyard inventories drop substantially below desired levels, a renewed chorus of "Woods Labor Crisis" laments the dwindling labor force in a time of rising wood needs. Now that large acreages of pine plantations are reaching merchantability on the southern wood supply scene, the labor supply for thinning naturally becomes a concern.

Trends

Trends in output and employment in southern timber harvesting can help this analysis define the labor prospects for thinning. For example, industrial timber output remained relatively steady through the early 1960s, but since then it has increased by almost two-thirds.

But more significant of the changes in the South the past 30 years have been those among the individual industrial sectors. The pulp and paper industry's use of pulpwood has grown from 10 million to 50 million cords. In contrast, sawlog consumption continued a long-term decline until 1961, when total southern lumber production reached a low point of 9.1 billion board feet. Although lumber production has since increased by almost one-third, it still has not recovered to the output levels of 30 years ago. Similarly, the moribund veneer log output suddenly changed to an

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upward trend with emergence of the softwood plywood industry in 1963. The most notable of these changes, however, involves the pulp and paper sector, which has become the dominant consumer of the southern timber harvest.

Despite the overall increase in timber consumption by primary wood-processing plants, the amount of labor used in supplying these industries has not increased. Census of Manufactures data for the southern logging industry show employment peaked at 30.2 thousand in 1958. Since then, employment has fluctuated slightly below that level, with 29.6 thousand employees reported in the 1977 census.

However, Census of Manufactures figures for the logging industry do not accurately reflect total employment in timber harvesting. Excluded are unidentified logging employees of primary manufactures (e.g., sawmills, veneer mills, and pulpmills), employees of firms engaged in transporting timber who perform no cutting operations, and many part-time, self-employed loggers. The latter omissions were particularly significant in past years when part-time or seasonal workers made up a much larger component of the woods labor force than they do today.

For this reason, forestry analysts concerned with estimating labor requirements in timber harvesting relate annual volumes of timber output with average regional productivity factors to determine full-time employment equivalents. Such estimates show total harvesting employment declined from about 132,000 in 1954 to 86,000 in 1963. It held steady in the mid-1960s, but

then continued its decline to 79,000 in 1972 (Table 1). Most of the drop occurred in sawlog harvesting, while veneer log employment turned upward because of the rapid growth of the pine plywood industry. Surprisingly perhaps, there has also been a slight--but recently accelerating--decline of employment in pulpwood harvesting.

Table 1.--Full-time employment equivalents in southern timber harvesting.

Product	1954	1958	1963	1967	1972
Pulpwood	50,000	46,350	43,850	44,450	42,000
Sawlogs	75,900	50,950	38,550	34,800	27,800
Veneer logs	6,600	5,400	3,500	7,200	9,500
Total	132,500	102,700	85,900	86,450	79,300

Source: Hair, 1963; Phelps, 1980.
Estimates are for the 12 most southern states, including Virginia.

The reduction of employment in pulpwood harvesting is due largely to productivity gains and increased residue use. The production of chips from sawmill residues began in the mid-1950s. By 1978 the byproducts from various wood product operations amounted to 17 million cords--one-third of the pulpmill supply. Through the 1960s, residues supplemented an increasing harvest of roundwood for pulpwood. But since 1970, roundwood production has stablized, and residues have provided the increase in pulpwood

supplies. Apart from productivity gains then, the residue supply increase alone has kept pulpwood labor requirements from increasing since 1970, because this source is essentially labor-free compared to the manpower needed to produce an equivalent volume of roundwood.

Mechanization, of course, has affected employment in pulpwood harvesting also. Concern over labor supplies and rising labor costs has spurred the substitution of capital for labor since the late 1950s. Capital-per-employee data from the Census of Manufactures indicate the changes in the relative amounts of capital and labor used, and also the capital intensity of the industry when compared to other industries (Table 2). New capital expenditures per employee for southern timber harvesting have exceeded the rate for all manufacturing since 1958, and have been growing at a faster rate than timber harvesting nationally. For the latest 5-year period, the growth rate for the South has exceeded 20 percent annually. These investments have helped push productivity advances in timber harvesting above the average for all manufacturing since 1958 (Kaiser, 1971; Risbrudt, 1979). Such advances are expected to continue. Logging is one industry for which the Bureau of Labor Statistics has projected productivity gains that will more than offset increases in output, causing employment to decline through 1990 (Personick, 1979).

At the same time, the labor resource for the woods labor supply has been expanding. Figures from the 1970 Census of Population show that three-quarters of the logging force came from the

Table 2.--New capital investment per employee.

Year	All manufacturing	Timber harvesting	
		U.S.	South
1954	$ 499	$ 644	$ 328
1958	590	954	715
1963	700	1,307	928
1967	1,163	1,438	1,204
1972	1,265	1,962	1,612
1977	2,455 P	4,553 P	4,034 P

Source: Census of Manufactures.

P - Preliminary.

rural nonfarm sector and more than 18 percent came from urban areas, which include any town with more than 2,500 people. Since 1950, the rural nonfarm population in the South has remained steady and the relevant urban category has increased. Therefore, the notion of a shrinking population base upon which to draw for woods workers appears unfounded.

Prospects

Given the above scenario of a declining demand and an increasing potential supply, fulfilling labor needs for thinning--which would be small in relation to total harvesting employment--would not appear to be a major problem. However, a number of changes have accompanied mechanization, and now they must be addressed if problems are to be avoided.

The large fixed costs of capital-intensive harvesting require full-time, year-round operations. In addition, the nature of the work has changed and skill requirements have increased--fellers, buckers, and teamsters have been replaced by equipment operators and mechanics. In turn, coping with these changes requires a much higher managerial ability. These are the challenges that must be resolved to provide labor for timber harvesting and, more immediately, labor for thinning.

Woods labor problems can be related to tree sizes. That is, labor problems decrease as tree sizes increase and vice versa. Over the years, the labor problem has been in harvesting pulpwood, not sawlogs. Thus, a movement toward managing pine plantations for multiproducts has both good and bad aspects. Growing sawtimber will provide more productive and higher quality woods jobs in the future with more chips to fill pulpmill requirements. But in the immediate period, this also means more thinning, which always has been a marginal logging chance at best.

Solving the thinning problem will require more active participation by industry in harvesting operations. Thinning will be a specialized operation, and a substantial infusion of capital is still needed for the development, testing, and demonstration of the most promising techniques and systems. These are functions company harvesting operations have been performing for some time, but the primary focus has been on equipment. Company operations can also play a role in upgrading the labor component, which the following will illustrate.

Training of woods workers has long been advocated as a means of increasing the woods labor supply. But most efforts have failed. One exception is a program being conducted at the Washington Country Vocational Technical Institute in Calais, Maine. Since 1972, more than 400 students have been trained to harvest timber with chain saws and skidders. Initially, about 90 percent of the graduates were hired by pulp and paper companies conducting pulpwood harvesting operations in the area. But over the past 5 years, an estimated 80 percent have been employed by independent contractors. Significantly, the retention rate has consistently been close to 70 percent. The number of classes, which run for 22 weeks with 10 to 15 students per class, has expanded from 2 to 6 per year, and an additional program has been started at another "vo-tech" institute. The cost for tuition, room and board, and books and safety equipment, which is currently about $1,500, is paid by the student.

Apart from dedication of the staff and its director--important to the success of this program--a crucial element was the initial employment of graduates by company harvesting operations. It is necessary to be able to offer trainees a fairly attractive job. Thus, company operations may be the key to the establishment of such programs in the South.

The Maine program has also demonstrated progress in another problem area--the injury rate. Although precise figures are not available, feedback to the program director indicates the accident record for the graduates has been similar to that of older

and experienced workers, and far below that of new entrants with no formal training. Recent research of logging work injuries has found that one-half of all accidents occur among employees who have less than one year's work experience and one-third among those with less than 4 months (Wolf and Dempsey, 1978).

Another avenue to promote safety involves ergonomics research. Little known in this country but well established in Scandinavia, ergonomics refers to the relationship between man and machine--for instance, reducing problems in using machinery. This could be a cooperative effort on the part of industry, universities, government agencies, and harvesting equipment companies. The latter should particularly be interested, since ergonomics can be used to promote product safety and cut down product liability (Roberts, 1979).

The payback to companies from investment in these areas should be more qualified woods workers and reduced workers' compensation costs. Past safety promotions and OSHA notwithstanding, such insurance rates continue to rise--as high as $50 per $100 payroll in Kentucky. Of all programs to combat this cost, self-insuring groups among loggers have recently had some success. Two such programs are currently under way in Michigan and Maine (Grieves, 1978; Smith, 1978). The Michigan group recently reported a reduction in total cost that saved members more than 40 percent on workers' compensation costs. This is a tangible incentive to institute safety standards. As an aside, perhaps

enforcement by peers is an effective aspect to acceptance of safety standards by contractors.

Both of the programs, however, required legislation to allow the formation of such groups. Similar action should be supported in states where an authorizing amendment to the workers' compensation law is needed. Amendments to workers' compensation laws permitting self-insuring groups were passed in Arkansas, Louisiana, and Virginia in 1979.

Such assistance and educational efforts for contractors or producers should not be neglected. They are the employers of the woods labor force, and their ranks must be carefully groomed. Business-minded employees could be spun off from company operations. Although there are many areas of possible assistance, one easy way is merely to channel information to managers that will help them upgrade working conditions. For example, producers and workers should be fully informed about Keogh plans and individual retirement accounts (IRAs). The retirement program incentive might help to hold workers in timber harvesting.

The substitution of capital for labor in the woods appears to be taken for granted as a means to increase productivity and keep logging costs in line. But today the machine cost for most southern pulpwood exceeds that of labor. And the past few years have shown that machine costs can rise at a faster rate than wages.

Incentives to mechanize will continue, but boosting labor productivity this way alone can be costly. Experience with shortwood thinning machines has demonstrated such a result. Instead, the time is ripe for industry to recognize woods labor more as an investment than a cost. Industry can do this by supporting worker training, ergonomic research, management assistance, and programs that effectively reduce workers' compensation cost. Moreover, it is likely that high returns in the form of improved productivity and lower future costs could be realized from relatively modest support. As we enter the phase of possible widespread thinning of plantations across the South, investment in labor will provide the best opportunity for more efficient harvesting operations.

Literature Cited

GRIEVES, P. C.
1978. The Michigan Association of Timbermen Self-Insurers Fund (MAT-SIF) completes three successful years. Northern Logger and Timber Processor 26(8): 14-15.

HAIR, D.
1963. The economic importance of timber in the United States. U.S. Dep. Agric. For. Ser. Misc. Publ. 941, 91 p.

KAISER, H. F., JR.
1971. Productivity gains in forest products industries. For. Prod. J. 21(5): 14-16.

PERSONICK, V. A.
1979. Industry output and employment: BLS projections to 1990. Monthly Labor Review 102(4): 3-14.

PHELPS, R. B.
1980. Timber in the United States economy. U.S. Dep. Agri. For. Ser. (In process)

RISBRUDT, C. D.
1979. Past and future technological change in the U.S. forest industries. Ph.D. dissertation, Michigan State University, 180 p.

ROBERTS, B.
1979. Ergonomics is applied to product safety and control. For. Prod. J. 29(11): 13, 60.

SMITH, D. M.
1978. Group self-insurance under the Maine workers' compensation act. Northern Logger and Timber Processor 27(6): 8, 38-39.

WOLF, C. H. and G. P. DEMPSEY
1978. Logging work injuries in Appalachia. U.S. Dep. Agri. For. Serv. Res. Pap. NE-416, 13 p.