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Continuing Education and Training Needs



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CONTINUING EDUCATION AND TRAINING NEEDS OF THE SOUTHERN FOREST INDUSTRY

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EXECUTIVE SUMMARY

The introduction of new production and processing technologies and the rapid expansion of timber production in the South have resulted in an increasing need for educational and training programs for personnel at all levels of the forest industry. In 1984, the Texas Agricultural Experiment Station in cooperation with the Forestry and Harvesting Training Center conducted a mail survey to assess continuing education needs as perceived by southern forest industry executives and the likely responses to these needs by forestry schools, trade organizations, and other providers of continuing education. This report presents the results of that survey, including information on self-perceived factors that influence participation in education and training courses from executives and course providers.

Industry executives emphasized the importance of managerial, decisionmaking and communication skills, and an understanding of wood procurement and production for upper and middle management, and supervisors. Only a few of the topics included in the survey were perceived by executives as necessary information for technicians and other operating personnel. There was a general lack of agreement on subject matter needs mentioned by industry users and emphasis proposed by providers of continuing education. All respondents agreed that relevance and practicality were the major factors affecting the decision to participate in courses offered by any organization. Also, travel costs and distances were judged to be more important than tuition charges. There was no preferred season for programs, but most respondents preferred that courses be offered during the middle of the week.

Overall, the results support a major objective of the Center and similar training facilities to improve the administrative and technical skills of key personnel, particularly in wood procurement and harvesting. The disparity between needs perceived by industry executives and areas of emphasis anticipated by the providers of continuing education suggests a continuing need for such centers. The need for more effective communication between the users and providers of continuing education also is suggested. Improved communication can be accomplished by:

- increasing the frequency of dialogue between users and providers;
- expanding and varying the membership of advisory boards to include a broader representation of these groups; and
- coordinating more activities between and within the two groups.

This survey suggests that program offerings may fall short of the industry's expectations without more active communication.

Continuing Education and Training Needs of the Southern Forest Industry

INTRODUCTION

The demand for wood products is projected to escalate drastically throughout the world by the year 2000. According to the USDA Forest Service (Raisch and Killian, 1981), global wood consumption is expected to increase in the next 15 years by more than 40%. The southern forest region of the United States is ideally suited to provide a larger share of domestic and international market needs than it does now.

The southern forest products industry has contributed significantly to commercial wood production, job creation, and community economies. Approximately 41% of the nation's commercial forest lands are located in the 14 southern states. The timber harvested from southern forests in 1979 provided 658,000 jobs with a payroll of \$7.4 billion, and produced \$17.4 billion (34% of national total) in value added by manufacturing as a contribution to the regional economy. In Texas alone, it provided 75,300 jobs with an annual payroll of \$835 million and produced \$1.9 billion in value added by manufacturing (American Forest Institute, 1982).

The growth of this industry and the maintenance of a competitive position in domestic and world trade is dependent upon a predictable supply of reasonably-priced raw material and efficient harvesting and processing operations. The rapid shift from dependence on nature's providence to intensively-cultured forest plantations to meet future needs has required the adoption of new technologies such as genetic improvement, fertilization, and control of competing vegetation. The rapid mechanization of forest operations, ranging from reforestation to harvesting, requires substantial capital outlays for equipment acquisition and operation. Investments in the growth and harvesting of timber have increased faster than inflation in recent years. Intensive forest management also has generated public concern about its compatibility with other environmental values.

The technical, administrative, and communication issues raised by these changes demand that administrative, professional, and other operating personnel in the industry stay abreast of new techniques for improving productivity in a society attenuated to environmental concerns. Maintaining this currency has been difficult through traditional course offerings in continuing education because of the diverse interests of the participants and a lack of continuity among courses. For example, programs designed for professional foresters are typically intended to appeal to those in public agencies as well as industry and frequently lack the orientation preferred by industrial managers.

The Forestry and Harvesting Training Center, a southern regional consortium of industrial firms and forestry schools, was organized in 1974 to specifically

address educational needs of participating firms. Forestry school curricula that did not emphasize harvesting and transporting wood raw materials were of particular concern to the industry. The sharing of experiences gained by the participating firms with the forestry schools was viewed as the most practical means of imparting the necessary technical and managerial skills to industrial personnel across the region.

The Center has sponsored many innovative courses over the past decade and its leadership has encouraged other organizations to become more responsive to industry's needs. Human resource managers now have a broad array of courses conducted at various regional locations and throughout the year from which to meet manpower development needs.

The availability of alternative continuing education programs, coupled with the sagging financial base of the Center during the economic recession of the early 1980's, led the Center's advisory committee in 1984 to propose an assessment of continuing education needs and offerings across the region. The intent of the study was to determine the needs as perceived by industry leaders and to determine the anticipated availability of programs sponsored by other organizations that might meet industry needs. The results are intended to assist the committee in identifying a role for the Center in subsequent years and to provide guidance for others' sponsoring or offering continuing education and training to southern forest industry personnel. The assessment was conducted by specialists in the Departments of Rural Sociology and Forest Science of the Texas Agricultural Experiment Station, Texas A&M University System.

RESEARCH METHODS

Data for this study were obtained by a mail survey conducted from August to October 1984. After an initial mailing of the questionnaires, a second mailing was conducted several weeks later to nonrespondents. On each occasion, a cover letter prepared on the letterhead of the Forestry and Harvesting Training Center was sent to explain the purpose of the survey and to encourage participation.

Study Design

The survey involved two purposively selected groups of individuals. One group consisted of 177 industry executives who make decisions regarding the continuing education and training needs of their company personnel. Executives were selected from 58 wood-based companies operating in 14 southern states. Questionnaires were sent to the individual responsible for overall land manage-

ment and wood production, to the individual responsible for land management, and to the wood procurement manager within each company in each state. Overall, 108 individuals responded to the survey. The participating companies selected are listed in Appendix A.

The second group consisted of 58 individuals representing organizations that provide continuing education and training courses for forestry personnel in the southern region. Of this group, 45 responded; 14 were employed by state cooperative extension services, 10 by forestry schools, 9 by trade associations, and 12 by federal and state forestry agencies. Appendix B lists the participating organizations by state.

Survey Instruments

Questionnaires consisting of three series of questions were developed for the two groups of respondents. One series was designed to determine socioeconomic characteristics of respondents. These questions sought information on employment position, number of years in current position, age, and educational level of respondents.

The second series of questions pertained to the relative importance of various topics to the industry and to the organizations that provide educational programs. Overall, 49 topics were listed in nine broad subject areas:

- Site improvement (3 topics)
- Site preparation (2 topics)
- Regeneration (2 topics)
- Treatment of intermediate stands (4 topics)
- Wood procurement and production (11 topics)
- Raw material transportation (3 topics)
- Equipment management and maintenance (9 topics)
- Administration and decisionmaking (10 topics)
- Communications (5 topics)

For such questions, industry executives were asked to use a scale ranging from one ("not important") to five ("very important"). Respondents were instructed to rate the level of importance of each topic for individuals in each of five categories of employment. The job categories were listed and defined as:

- Administrators: Individuals whose primary responsibilities are above the technical level.
- Young professionals: Professional individuals whose primary responsibilities are at the technical level.
- Supervisors: Individuals responsible for the first-line supervision of people, equipment, and production.
- Technicians: Individuals with a specialized knowledge of a subject or task.

- Operatives: Equipment operators and semi-skilled workers.

Providers of continuing education and training courses, on the other hand, were asked to indicate how much emphasis they planned to devote to each topic during the next 5 years. Using a five-point scale ranging from one ("no emphasis") to five ("a great deal of emphasis"), they based their assessments on manpower development without regard to category of employment.

The final series of questions involved the identification of factors which all respondents perceived as possibly affecting participation in education and training courses. Both groups of respondents in the survey were asked questions related to travel distance, preferred scheduling, and factors affecting participation by each category of employee. The questionnaire for industry executives included questions about their personal participation in courses as well as levels of participation by other employees. They were also queried to determine preferences for internal company programs versus those provided by other organizations.

CHARACTERISTICS OF SURVEY PARTICIPANTS

Employment and socioeconomic characteristics of industry executives and course providers are presented in Tables 1 and 2, respectively. Among the executives, 87% held middle and upper management positions. Other respondents (12%) included superintendents, project supervisors, and chief foresters. All industry respondents will be identified as "industry executives" in this report. Forty-seven percent had held their position less than 5 years, 33% between 5 and 9 years, and 18% 10 or more years. The average age was almost 48 years. Educationally, 70% had bachelor degrees and 27% had advanced degrees. One respondent reported having a technical degree.

Of the 45 course providers who responded, 24% were senior managers, such as academic deans and directors, 22% were heads of academic departments, 24% were chief foresters in state Cooperative Extension Services, and 13% were professors. Thirteen percent held other kinds of positions such as training officers and project supervisors. The average number of years spent by course providers in their current position (mean = 6.2) was slightly more than that for woodland managers (mean = 5.8). Also, course providers tended to be younger than industry executives, with an average age of 45 years. A majority of the course providers (58%) had attained advanced degrees, whereas 40% had a bachelor's degree.

Several socioeconomic differences were observed among the four groups of course providers. As shown in Table 3, respondents employed by regional forestry schools and cooperative extension services had, on the average, almost twice the number of years in their current positions as respondents employed by the federal or state forest agencies and trade associations. They were also slightly older and had higher educational degrees than the latter groups.

TABLE 1. EMPLOYMENT AND SOCIOECONOMIC CHARACTERISTICS OF SURVEYED SOUTHERN FOREST INDUSTRY EXECUTIVES

Employment and Socioeconomic Characteristics (Total=108)	Number of Respondents	Percent of Total
Employment Position:		
Senior woodlands manager	37	34.3
Middle manager	57	52.8
Other	13	12.0
No response	1	.9
Years in Position:		
Less than 5	51	47.2
5 to 9	36	33.3
10 or more	20	18.5
No response	1	.9
Mean = 5.82		
Standard deviation = 4.57		
Age:		
29 to 38 years	12	11.1
39 to 48	47	43.5
49 to 58	39	36.1
59+	8	7.4
No response	2	1.8
Mean = 47.69		
Standard deviation = 7.63		
Education Degree:		
Technical	1	.9
Bachelor	76	70.4
Master	28	25.9
Doctorate	2	1.8
No response	1	.9

TABLE 2. EMPLOYMENT AND SOCIOECONOMIC CHARACTERISTICS OF SURVEYED PROVIDERS OF CONTINUING EDUCATION AND TRAINING

Employment and Socioeconomic Characteristics (Total=45)	Number of Respondents	Percent of Total
Employment Position:		
Senior management	11	24.4
Department head	10	22.2
Chief forester	11	24.4
Professor	6	13.3
Other	6	13.3
No response	1	2.2
Years in Position:		
Less than 5	21	46.7
5 to 9	15	33.3
10+	8	17.8
No response	1	2.2
Mean = 6.18		
Standard deviation = 5.41		
Age:		
29 to 38 Years	12	26.7
39 to 48	17	37.8
49 to 58	9	20.0
59+	5	11.1
No response	2	4.4
Mean = 44.81		
Standard deviation = 9.00		
Education Degree:		
Bachelor	18	40.0
Master	10	22.2
Doctorate	16	35.6
No response	1	2.2

NEEDS AND EMPHASES FOR CURRICULUM DEVELOPMENT

Needs Perceived by Industry Executives

Using the five-point scale, the executives assessed the importance of each topic for each of the five employment positions (Table 4). A majority of the total mean responses were near the middle of the scale indicating some importance for topics. However, individual topic means varied widely by employment position showing some association between job level and educational needs. Respondents indicated that 21 of the 49 topics among the nine subject areas were very important (a mean equal to or greater than 4.00) for company administrators. They perceived 22 topics as very important for young professionals and 17 as very important for supervisors. Respondents placed more importance on equipment maintenance and related topics for technicians and operators.

Generally, executives viewed the continuing education needs of administrators and young professionals to include courses related to corporate management, decisionmaking, and communication. Contract and fiscal management topics were perceived as more important for administrators than for young professionals. For supervisors, respondents rated operational topics related to wood procurement and production, and equipment management and maintenance as being important. They also reported that courses which improved verbal and written communication skills were very important for supervisors. Executives did not perceive many of the topics listed on the questionnaire (Table 4) as especially needed by technicians and operatives. Topics which they viewed as moderately important for technicians and operatives (mean scores between 3.50 and 4.00) involved skill applications for equipment maintenance. Prescribed burning in intermediate stands also was considered to be an important topic for technicians.

Proposed Emphases by Course Providers

Unlike industry executives, course providers were asked to estimate how much emphasis they planned to give each topic in their courses during the next 5 years. Their responses and means are reported in Table 5. Information management was the only topic which had mean scores equal to or greater than 4.00. Other topics receiving much emphasis (mean scores between 3.50 and 4.00) were motivation of small nonindustrial landowners, artificial and natural regeneration, taxation, chemical site preparation, and prescribed burning of intermediate stands. Except for the latter topic, mean responses by course providers for these topics were higher than the corresponding responses by industry respondents.

Differences Between Perceived Needs and Proposed Emphases

Cautious comparisons between the general mean responses of course providers and the specific mean

TABLE 3. SOCIOECONOMIC CHARACTERISTICS OF FOUR GROUPS OF PROVIDERS OF CONTINUING EDUCATION AND TRAINING TO THE SOUTHERN FOREST INDUSTRY

Socioeconomic Characteristics	State Cooperative Extension Service		Regional Forestry Schools		Federal/State Forest Agencies		Trade Associations	
	Number	Percent ^a	Number	Percent ^a	Number	Percent ^a	Number	Percent ^a
Years in Position:								
Less than 5	5	35.7	2	20.0	6	66.7	8	66.7
5 to 9	5	35.7	6	60.0	1	11.1	3	25.0
10+	4	28.6	2	20.0	1	11.1	1	8.3
No response	0	—	0	—	1	11.1	0	—
Mean	7.36		8.10		4.25		4.50	
Standard deviation	6.76		5.53		3.45		4.12	
Age:								
29 to 38 years	1	7.1	1	10.0	4	44.4	6	50.0
39 to 48	9	62.3	4	40.0	2	22.2	2	16.7
49 to 58	4	28.6	3	30.0	1	11.1	1	8.3
59+	0	—	2	20.0	0	—	3	25.0
No response	0	—	0	—	2	22.2	0	—
Mean	45.36		49.00		39.43		43.83	
Standard deviation	6.06		7.92		8.52		11.79	
Education Degree:								
Bachelor	3	21.4	0	—	6	66.7	9	75.0
Master	5	35.7	0	—	2	22.2	3	25.0
Doctorate	6	42.9	10	100.0	0	—	0	—
No response	0	—	0	—	1	11.1	0	—

^aPercentages calculated by using the total number of respondents in each group.

responses by industry executives for the five categories of employees suggests additional differences between topics to be emphasized and topics perceived as important for continuing education and training. Major differences occurred regarding topics in four subject areas. First, wood procurement and production topics were not emphasized by course providers, but were perceived by industry executives to be moderately or very important for administrators, young professionals, and supervisors. Specific topics included harvest planning and management, organization of operation, production cost estimates, and public relations. Other areas where differences emerged included timber contracts and environmental and silvicultural constraints.

The two groups of respondents also differed on most topics related to communications. The lone exception was techniques for motivating small nonindustrial landowners. In each case, these topics were considered important by industry executives for administrators, young professionals, and supervisors, but were not emphasized by course providers.

Administration and decisionmaking was a third subject area that was not emphasized by course providers but was perceived by industry executives as important for administrators. Course providers gave all topics under this subject area an average mean of 3.06, compared to 4.49 by industry respondents.

Equipment management and maintenance was the final subject area about which respondents differed. None of the topics in this area received much emphasis by course providers. On the other hand, industry executives considered topics such as preventive versus corrective maintenance, on-site versus shop maintenance,

and parts and equipment inventory to be important topics for supervisors and operatives. Moreover, they rated company versus contract maintenance and machine life and replacement to be important topics for administrators.

Differences Among Course Providers

In addition to these differences between course providers and industry representatives, the four groups of course providers differed in planned levels of emphasis on various topics. Mean responses are presented for each group in Table 6. Of the 49 topics listed in the questionnaire, respondents employed by state forestry extension services planned to greatly emphasize two topics — information management and motivating small nonindustrial landowners. Of the four groups, respondents from southern forestry schools indicated that they would devote attention to more topics than other respondents. Their five highest emphasized topics were site improvement, chemical site preparation, artificial regeneration, information management, and written communication. Respondents employed by federal and state forest agencies indicated they would emphasize natural and artificial regeneration. Finally, respondents from industry trade associations were interested primarily in emphasizing taxation and the motivation of small nonindustrial landowners. None of the groups indicated that the broad subject areas of raw material transportation and equipment management and maintenance would receive much emphasis (means were less than 3.00).

(Continued on page 9.)

TABLE 4: SUBJECT AREA IMPORTANCE FOR PERSONNEL CATEGORIES REPORTED BY SOUTHERN FOREST INDUSTRY EXECUTIVES

Subject Areas ^a	Mean Responses for Personnel Categories ^b					Total Mean Responses
	ADMIN	PROF	SUPER	TECH	OPER	
Site Improvement						
Physical and chemical factors affecting productivity	3.40	4.14	3.69	2.67	1.71	3.12
Environmental constraints	4.16	4.25	3.97	3.06	2.14	3.52
Water management	3.51	4.00	3.65	2.92	2.00	3.22
Site Preparation						
Chemical means	3.38	4.37	4.09	3.45	2.38	3.53
Mechanical means	3.16	4.13	4.11	3.38	2.56	3.47
Regeneration						
Natural	3.00	3.93	3.51	3.01	1.76	3.04
Artificial	3.21	4.35	4.04	3.42	2.21	3.45
Treatment of Intermediate Stands						
Vegetation control	3.14	4.17	3.84	3.16	2.05	3.27
Fertilizers	3.09	4.02	3.55	2.92	1.79	3.07
Thinning	3.22	4.16	3.90	3.34	2.04	3.33
Prescribed burnings	3.07	4.31	4.31	3.67	2.76	3.62
Wood Procurement and Production						
Timber contracts	4.37	4.11	3.63	2.63	1.46	3.24
Raw material allocation	4.56	3.86	3.32	2.26	1.40	3.08
Harvest planning	3.98	4.29	4.00	2.72	1.51	3.30
Equipment availability	3.36	3.65	4.31	2.86	2.68	3.37
Organization of operation	4.12	3.89	4.13	2.86	2.68	3.37
Roads and decks	2.52	3.67	4.36	3.29	2.99	3.37
Environmental and silvicultural constraints	3.97	4.35	4.12	3.04	2.20	3.54
Production costs estimates	4.38	4.31	4.20	2.73	1.88	3.50
Harvest management	3.84	4.20	4.06	2.70	1.64	3.29
Public relations	4.60	4.31	3.93	3.00	2.42	3.65
Utilization of standards and measurements	3.63	4.04	3.77	3.15	2.06	3.33
Raw Material Transportation						
Truck (primary) transportation	3.52	3.67	3.93	2.51	1.84	3.09
Woodyard management	3.59	3.75	4.11	2.55	1.84	3.17
Secondary transportation (rail, barge)	3.55	3.46	3.31	2.16	1.52	2.80

TABLE 4: SUBJECT IMPORTANCE (CONT.)

Subject Areas ^a	Mean Responses for Personnel Categories ^b					Total Mean Responses
	ADMIN	PROF	SUPER	TECH	OPER	
Equipment Management and Maintenance						
Preventive vs. corrective maintenance	3.28	3.57	4.57	3.59	4.11	3.82
On-site vs. shop maintenance	2.99	3.22	4.18	3.09	3.31	3.36
Company vs. contract	4.02	3.53	3.71	2.51	1.83	3.12
Parts and equipment inventory	3.09	3.11	4.09	2.80	2.10	3.04
Machine life and replacement	3.97	3.52	3.98	2.49	2.17	3.23
Welding	1.53	1.85	3.14	3.45	4.03	2.80
Power train	1.71	2.05	3.48	3.53	3.89	2.93
Hydraulics	1.70	2.05	3.52	3.55	3.89	2.94
Electrical maintenance	1.67	2.05	3.40	3.58	3.79	2.90
Administration and Decision Making						
Tactical and strategic planning	4.83	3.79	3.10	2.02	1.18	2.98
Program development, implementation, and evaluation	4.77	3.86	3.30	2.12	1.28	3.07
Capital needs and budgeting	4.83	3.84	3.43	1.98	1.28	3.07
Manpower needs	4.66	3.66	3.74	1.83	1.29	3.04
Government and public relations	4.59	3.81	3.15	2.19	1.43	3.03
Contracts and labor relations	4.69	3.76	3.82	2.27	1.58	3.22
Taxation	4.57	3.54	2.39	1.60	1.18	2.66
Environmental constraints	4.44	4.09	3.62	2.72	1.96	3.37
Information management (including computers)	4.23	4.28	3.32	2.72	1.29	3.17
Contract vs company operations	4.42	3.65	3.15	2.02	1.28	2.90
Communications						
Writing skills	4.72	4.60	4.04	3.18	1.65	3.64
Listening and speaking skills	4.82	4.63	4.17	3.28	2.21	2.82
Effective use of the media	4.56	3.88	2.98	2.02	1.26	2.94
Identifying innovators and thought leaders	4.68	3.78	3.45	2.16	1.39	3.09
Motivating small nonindustrial landowners	3.80	4.23	3.34	2.76	1.44	3.11

^aResponses were according to a 5-point scale, 1 being "not very important" to 5 being "very important."

^bADMIM = administrators; PROF = young professionals; SUPER = supervisors; TECH = technicians; and OPER = operatives.

TABLE 5: PLANNED EMPHASIS BY PROVIDERS OF CONTINUING EDUCATION AND TRAINING FOR THE NEXT 5 YEARS

Subject Areas	Percent of Providers Who Responded					Mean Level of Response	Number of Respondents
	No Emphasis		A Great Deal of Emphasis				
	(1)	(2)	(3)	(4)	(5)		
Site Improvement							
Physical and chemical factors affecting productivity	16.3	30.2	11.6	14.0	27.9	3.07	43
Environmental constraints	9.3	27.9	39.5	11.6	11.6	2.88	43
Water Management.	7.1	33.3	16.7	14.3	28.6	3.24	42
Site Preparation							
Chemical means	7.1	9.5	28.6	26.2	28.6	3.60	42
Mechanical means.	11.6	23.3	39.5	14.0	11.6	2.91	43
Regeneration							
Natural.	11.4	11.4	20.5	18.2	38.6	3.61	44
Artificial	6.8	9.1	20.5	22.7	40.9	3.82	44
Treatment of Intermediate Stands							
Vegetation control	9.3	18.6	27.9	25.6	18.6	3.26	43
Fertilizers.	41.8	18.7	27.9	4.7	7.0	2.16	43
Thinning	11.4	13.6	25.0	27.3	22.7	3.36	44
Prescribed burnings.	9.1	11.4	18.2	36.4	25.0	3.57	44
Wood Procurement and Production							
Timber contracts	27.5	30.0	15.0	15.0	12.5	2.55	40
Raw material allocation	51.2	14.6	9.8	9.8	14.6	2.22	41
Harvest planning	22.0	14.6	19.5	17.1	26.8	3.12	41
Equipment availability	51.2	22.0	12.2	4.9	9.6	2.00	41
Organization of operation	50.0	17.5	12.5	7.5	12.5	2.15	40
Roads and decks	31.7	29.3	12.2	14.6	12.2	2.46	41
Environmental and silvicultural constraints	19.1	4.8	33.3	23.8	19.1	3.19	42
Production costs estimates	38.5	23.1	12.8	5.1	20.5	2.46	39
Harvest management	37.5	15.0	15.0	10.0	22.5	2.65	40
Public relations	26.2	14.3	23.8	19.1	16.7	2.86	42
Utilization of standards and measurements	45.0	20.0	17.5	12.5	5.0	2.13	40

TABLE 6: PLANNED SUBJECT EMPHASIS IN THE NEXT 5 YEARS BY FOUR GROUPS OF PROVIDERS OF CONTINUING EDUCATION AND TRAINING

Subject Area and Mean of Responses ^a	State Cooperative Extension Service	Regional Forestry Schools	Federal/State Forest Agencies	Trade Associations
Site Improvements:				
-Mean of Responses-				
Physical and chemical factors affecting productivity	2.54	4.20	3.00	2.73
Environmental constraints	2.57	3.80	2.88	2.46
Water management	2.62	3.89	3.44	3.27
Site Preparation:				
Chemical means	3.69	4.00	3.78	3.08
Mechanical means	3.16	3.40	2.67	2.36
Regeneration:				
Natural	3.50	3.56	4.22	3.33
Artificial	3.93	4.44	4.11	3.00
Treatment of Intermediate Stands:				
Vegetation control	3.54	3.50	3.22	2.73
Fertilization	1.77	3.10	1.89	2.00
Thinning	3.64	3.40	3.44	2.91
Prescribed burning	3.64	3.10	3.78	3.73
Wood Procurement and Production:				
Timber contracts	2.75	2.70	2.67	2.00
Raw material allocation	2.25	3.00	1.56	2.00
Harvest planning	3.17	3.40	3.11	2.80
Equipment availability	2.17	2.30	1.67	1.80
Organization of operation	2.50	2.60	1.44	1.89
Roads and decks	2.33	2.30	3.22	2.10
Environmental and silvicultural constraints	2.75	3.60	3.44	3.09
Production cost estimates	3.09	3.30	1.56	1.67
Harvest management	2.58	3.22	2.33	2.50
Public relations	2.42	2.20	2.89	3.91
Utilization of standards and measurements	1.82	2.67	2.56	1.64
Raw Material Transportation:				
Truck (primary) transportation	1.92	2.60	1.78	2.92
Woodyard management	1.75	2.30	1.22	1.30
Secondary transportation (rail, barge)	1.50	2.10	1.33	1.55

Thus, differences between course providers and industry executives are partially attributable to differences among the four groups of course providers. As a group, trade associations were the most likely not to emphasize topics in wood procurement and production, while federal and state forest agencies were the most likely not to emphasize topics relating to administration, decision-making, and communications.

FACTORS AFFECTING PARTICIPATION IN CONTINUING EDUCATION COURSES

Participation by industry personnel in continuing education and training courses can be affected by several factors. In the course of the survey, industry executives were asked to report how many days in 1983 company personnel in each of the five employee categories had actually attended courses offered in-house or away. Table 7 indicates that middle and upper management had a higher level of participation than technicians and operatives. Participation in company-offered courses (means ranged from 3.42 to 7.09 days) was greater than in courses taught away from places of employment (means ranged from .88 to 5.17 days). Supervisors, followed closely by young professionals and administrators, spent the greatest amount of time attending in-house education and training programs, while young professionals and administrators were most involved in courses away from their place of employment.

Industry executives and course providers perceived several factors to influence course attendance by each category of industry personnel. Both groups of respondents mentioned course relevance and practicality as the major factor for all categories of employees (Table 8). Executives cited travel cost and distance as another factor, particularly for operatives. A larger percentage of course providers mentioned this factor for each personnel category than did industry respondents. Less than one in five respondents judged other factors such as the length and timing of courses, career enhancement and job security, or company policy to be determining factors.

When asked about the scheduling of continuing education and training courses, the majority of both groups of respondents said mid-week was the most convenient period for managers and employees to attend

courses taught away from place of employment (Table 9). However, significant percentages of respondents (30 to 45%) thought that Monday and Friday also were convenient days for technicians and operatives. Few respondents favored the weekends. Industry executives considered the summer months to be inconvenient for all personnel (Table 10). February through May was considered to be the most opportune period for participation by administrators. These months (except May) also

TABLE 8. PARTICIPATION FACTORS MOST OFTEN MENTIONED BY SOUTHERN FOREST INDUSTRY EXECUTIVES AND PROVIDERS OF CONTINUING EDUCATION AND TRAINING

Factor by Personal Category	Industry Executives (Total = 108) ^a	Course Providers (Total = 45) ^b
(1) Relevance/Course Contents/ and Practicality:	Percent of Total	
Administrators	47.2	37.8
Young Professionals	48.1	31.1
Supervisors	42.6	26.7
Technicians	40.0	28.9
Operatives	32.4	31.1
(2) Cost and Distance to Attend Course:		
Administrators	12.0	22.2
Young Professionals	12.0	28.9
Supervisors	13.9	22.2
Technicians	15.7	26.7
Operatives	20.4	26.7
(3) Timing and Length of Course:		
Administrators	19.4	13.3
Young Professionals	13.9	8.9
Supervisors	13.9	15.6
Technicians	13.9	4.4
Operatives	12.0	4.4
(4) Career Enhancement:		
Administrators	4.6	11.1
Young Professionals	5.6	8.9
Supervisors	5.6	8.9
Technicians	3.7	8.9
Operatives	4.6	8.9

^aLess than 8% of the respondents mentioned each of five other factors, including attendance being company policy and career enhancement/job security reasons.

^bApproximately 11 to 13% of the course providers mentioned career enhancement/job security reasons for each personnel category.

TABLE 7. DAYS OF CONTINUING EDUCATION AND TRAINING PARTICIPATION BY SOUTHERN FOREST INDUSTRY PERSONNEL, 1983

Personnel Category	Courses Offered In-house			Away from Place of Employment		
	Number of Days	Mean	Standard Deviation	Number of Days	Mean	Standard Deviation
Administrators	94	6.65	11.41	93	5.01	5.60
Young Professionals	95	6.81	11.19	94	5.17	7.33
Supervisors	96	7.09	18.84	94	3.55	4.56
Technicians	94	4.99	8.74	91	2.80	4.20
Operatives	94	3.42	5.68	88	.88	1.74

TABLE 9. MOST CONVENIENT DAYS OF THE WEEK FOR INDUSTRY PERSONNEL TO ATTEND CONTINUING EDUCATION AND TRAINING COURSES AS PERCEIVED BY INDUSTRY EXECUTIVES AND COURSE PROVIDERS

Respondents and Personnel Categories	Days of the Week (%)						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Industry Executives (Total = 108):							
Administrators	5.5	11.1	74.1	76.8	81.5	21.3	6.5
Young Professionals	13.9	22.2	75.9	79.6	81.5	35.2	9.3
Supervisors	4.6	19.4	75.9	78.7	77.8	28.7	5.5
Technicians	13.9	44.4	75.9	74.1	73.1	42.6	8.3
Operatives	9.3	40.7	67.6	69.4	71.3	46.3	10.2
Course Providers (Total = 45):							
Administrators	2.2	15.5	73.3	77.7	82.2	17.7	2.2
Young Professionals	11.1	26.6	73.3	73.3	77.7	24.4	11.1
Supervisors	4.4	15.5	66.7	68.8	71.1	24.4	6.6
Technicians	13.3	31.1	64.4	66.7	66.7	35.5	13.3
Operatives	11.1	35.5	64.4	68.8	66.7	37.7	11.1

TABLE 10. MOST CONVENIENT MONTHS OF THE YEAR FOR INDUSTRY PERSONNEL TO ATTEND CONTINUING EDUCATION AND TRAINING COURSES AS PERCEIVED BY INDUSTRY EXECUTIVES AND COURSE PROVIDERS

Respondents and Personnel Categories	Months of the Year											
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Industry Executives (Total = 108):						Percent of Total						
Administrators	34.2	47.2	50.9	49.0	49.0	35.1	34.2	34.2	42.5	45.3	32.4	19.4
Young Professionals	37.9	45.3	48.1	46.2	30.0	33.3	34.2	31.4	44.4	41.6	31.4	21.2
Supervisors	36.1	38.0	38.9	39.8	44.4	30.6	31.6	29.6	44.4	42.6	33.3	24.1
Technicians	39.8	41.6	44.4	43.5	47.2	28.7	37.0	37.0	49.0	48.1	40.7	30.5
Operatives	50.0	51.8	47.2	43.5	45.3	31.4	36.1	37.9	46.2	42.5	40.7	38.8
Course Providers (Total = 45):												
Administrators	33.3	48.8	40.0	35.5	35.5	33.3	35.5	35.5	37.7	40.0	46.6	33.3
Young Professionals	37.7	46.6	33.3	31.1	33.3	33.3	35.5	35.5	33.3	33.3	40.0	31.1
Supervisors	35.5	37.7	24.4	24.4	31.1	35.5	37.7	31.1	33.3	28.8	35.5	28.8
Technicians	40.0	37.7	24.4	31.1	35.5	37.7	37.7	35.5	35.5	31.1	33.3	24.4
Operatives	40.0	37.7	24.4	31.1	35.5	35.5	33.3	35.5	35.5	31.1	31.1	22.2

were thought to be convenient for young professionals. Respondents most often mentioned May, September, and October for supervisors and technicians and the months of January to March, May, and September for operatives.

In comparison, there was little consensus among course providers regarding optimum scheduling of courses. They most often mentioned February and November for offering courses to administrators and young professionals. Generally, less than two in five course providers agreed on scheduling for other personnel.

Industry executives also were asked about their preference for in-house education and training courses versus courses elsewhere. As shown in Table 11, large percentages of respondents preferred more in-house instruction for each personnel category, except that of administrators. Many respondents (47%) were satisfied with the level of in-house instruction administrators received, while 41% preferred more. For courses offered elsewhere, a majority of the executives wanted each personnel group to maintain their current level of participation. Almost a third of the respondents wanted more in-

struction away from their place of employment in the future, while only a few wanted less.

A final factor considered by respondents was how far company personnel would be willing to travel to attend courses. The average distances perceived for industry personnel by respondents are reported in Table 12. Both groups of respondents thought all types of industry personnel would be willing to fly further than drive and that administrators and young professionals would be willing to travel further than other personnel. Compared to the executives, course providers were slightly more likely to expect longer flight and driving distances, particularly by management. On the other hand, the executives thought supervisors, technicians, and operatives would drive further distances than those anticipated by course providers.

Travel distances perceived by the four groups of course providers are reported in Table 13. Forestry school respondents believed that industry personnel would be willing to travel the greatest average number of air miles (437 to 1,500 miles). Respondents from federal and state forest agencies reported the shortest distances (0 to 462 miles) and did not expect technicians and operatives to

TABLE 11. SOUTHERN FOREST INDUSTRY EXECUTIVES' PREFERENCES FOR CONTINUING EDUCATION AND TRAINING OPPORTUNITIES BY INDUSTRY PERSONNEL CATEGORY

Personnel Categories (Total = 108)	In-house Courses (%)			Courses Away from Place of Employment (%)				
	Less	Same Amount	More	No Response	Less	Same Amount	More	No Response
Administrators	5.6	47.2	40.7	6.5	5.6	53.7	36.1	4.6
Young Professionals	6.5	39.8	47.2	6.5	7.4	50.9	36.1	5.6
Supervisors	1.8	38.0	54.6	5.6	10.2	44.4	39.8	5.6
Technicians	2.8	41.7	48.1	7.4	8.3	52.8	30.6	8.3
Operatives	1.8	34.3	53.7	10.2	7.4	50.9	29.6	12.0

TABLE 12. PERCEIVED DISTANCE THAT INDUSTRY PERSONNEL WOULD TRAVEL TO ATTEND CONTINUING EDUCATION AND TRAINING COURSES

Mode of Travel and Personnel Categories	Industry Executives (Total = 108)	Course Providers (Total = 45)	Absolute Difference of Means
Commercial Airline:			
Administrators	871	1080	209
Young Professionals	776	830	54
Supervisors	600	670	70
Technicians	411	470	59
Operatives	296	161	135
Total mean	591	642	51
Automobile:			
Administrators	217	295	78
Young Professionals	236	295	59
Supervisors	221	206	15
Technicians	184	156	28
Operatives	153	123	30
Total mean	202	215	13

want to fly at all to attend courses. Course providers from cooperative extension services and trade associations had similar perceptions about tolerance to air travel. Such was not the case for their responses regarding automobile travel. Course providers in most groups perceived that personnel preferred to drive between 100 and 300 miles. However, respondents from trade associations perceived that administrators and young professionals would drive 450 to 500 miles.

CONCLUSIONS

The findings from this survey of industry executives and providers of continuing education and training courses in the southern forest products industry generally indicated more perceptual differences than similarities between and among groups of respondents. While continuing education and training of industry personnel is considered vital, respondents often differed regarding the content of such courses.

Industry respondents perceived a broad spectrum of courses as important. Courses in procurement and production of wood, administration and decisionmaking, and communication skills were viewed more often than

not as important to middle and upper management. Continuing education and training programs that are currently providing such courses appear to be addressing industry's needs, given the survey's findings and research reported elsewhere (Straka and Richards, 1984).

What was not clear from the survey's results were the continuing education and training needs of technicians and operatives and where these needs could be satisfied. The importance attached to equipment maintenance courses by industry executives suggested that some sector of the educational community should respond to these needs. Clearly, such responses are not anticipated by the providers who participated in this survey.

Overall, course providers do not plan to place very much emphasis on a large majority of the topics listed in the survey questionnaire. The possibility of the lists not being comprehensive lacked sufficient substance because all respondents were given the opportunity to identify additional subject areas in which industry personnel should receive training. None mentioned additional topics. However, when the responses of the four groups of course providers — state cooperative extension service, regional forestry schools, federal and state forestry agencies, and trade associations — were examined, several differences existed which affected the total average response calculated for each course. Group differences also were present among travel expectations for course attendance. When compared with corresponding responses from industry executives, these findings suggest that disparities may occur in the future regarding how the southern forest industry's needs for continuing education and training would be satisfied by course providers, who have among themselves different expectations and perceptions of priorities.

Such potential problems could be compounded further by the industry's desire to increase the number of in-house continuing education and training programs. Although this study did not determine the kinds of in-house courses that industry executives would prefer or who would teach such courses, it did determine that a greater diversity of company personnel were more likely to attend courses taught in-house than courses offered elsewhere. Where courses will be taught and who will participate, consequently, could have important implications for curriculum planning and program operation. Industry respondents clearly indicated that course relevance, cost, and travel distance affect attendance.

TABLE 13. DISTANCES THAT INDUSTRY PERSONNEL WOULD TRAVEL TO ATTEND CONTINUING EDUCATION AND TRAINING COURSES, BY TYPE OF COURSE PROVIDERS

Mode of Travel and Personnel Categories	State Cooperative Extension Service	Regional Forestry Schools	Federal/State Forest Agencies	Trade Associations
Commercial Airline:				
	Average Number of Miles, One-Way			
Administrators	1,093	1,500	462	1,180
Young Professionals	853	1,222	238	933
Supervisors	724	1,125	125	675
Technicians	399	938	0	587
Operatives	113	437	0	125
Automobile:				
Administrators	208	228	300	455
Young Professionals	240	209	244	500
Supervisors	202	211	225	188
Technicians	128	189	134	188
Operatives	115	161	72	144

If continuing education and training in the southern forest industry are to be conducted effectively and efficiently in the future, more communication is needed between users of continuing education and organizations that propose to meet industry needs. Their agenda should include identification of critical topics for particular users, instructional strategies, course schedules, and target audiences. Although industry executives stated many of their preferences in this survey, they did so without benefit of "interacting" with course providers to negotiate solutions and options for program planning. Further, it is equally important that various organizations which provide continuing education and training interact more among themselves to address critical issues in program planning and implementation. The development of such a continuing education consortia and the expansion of membership on advisory boards are useful ways to encourage and promote more dialogue, more coordination of activities, and more effective responses to industry needs.

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APPENDIX A

COMPANIES PARTICIPATING IN THE 1984 SOUTHERN FOREST INDUSTRY SURVEY, BY STATE

State	Participating Company	State	Participating Company
Alabama:	Alabama River Woodland American Can Canal Wood Champion International Container Corp. of America Great Southern Paper James River Kimberly-Clark MacMillan Bloedel Mead Scott Paper Union Camp	South Carolina:	Boise Cascade Bowater Catawba Timber International Paper Sonoco Products Stone Container Westvaco
Arkansas:	Arkansas Kraft Nekoosa Papers Potlatch Southern Pulpwood Weyerhaeuser	Tennessee:	Mead Tennessee River Pulp and Paper
Georgia:	Brunswick Pulp Land Continental Forest Industries Georgia Kraft Georgia Pacific Georgia Timberlands Gilman Paper Great Southern Paper Hercules Interstate Paper ITT Rayonier Owens Illinois Secrest Pulpwood & Timber Southland Timber Stone Container Union Camp	Texas:	Champion International Kirby Forest Industries Louisiana-Pacific Owens Illinois Temple EastTex Bear Island Paper Chesapeake Owens Illinois Union Camp United States Gypsum Virginia Fibre Westvaco
Florida:	Buckeye Cellulose Container Corp. of America Owens Illinois Southwest Industries	Virginia:	Bear Island Paper Chesapeake Owens Illinois Union Camp United States Gypsum Virginia Fibre Westvaco
Kentucky:	Westvaco	West Virginia:	CSX Resources Westvaco
Louisiana:	Boise Cascade Crown Zellerbach International Paper Manville Forest Products Group Williamette Industries		
Maryland:	Westvaco		
Mississippi:	International Paper Leaf River Forest Products TMA Forest Products Westvaco Weyerhaeuser		
North Carolina:	Abitibi Price Canal Wood Coastal Lumber Federal Paper Board Masonite Weyerhaeuser		

APPENDIX B

PROVIDERS OF CONTINUING EDUCATION AND TRAINING IN THE SOUTHERN FOREST INDUSTRY, BY STATE

State	Providers of Continuing Education
Alabama:	Alabama Forestry Commission Auburn University, Dept. of Forestry Alabama Forestry Association Alabama Cooperative Extension Service
Arkansas:	Arkansas Forestry Association Arkansas Forestry Commission
Florida:	Florida Division of Forestry University of Florida, School of Forest Resources and Conservation
Georgia:	University of Georgia, School of Forest Resources Georgia Forestry Commission Georgia Forestry Association U.S. Forest Service - Southern Region Southern Forest Institute Georgia Cooperative Extension Service
Kentucky:	Kentucky Division of Forestry University of Kentucky, Dept. of Forestry
Louisiana:	Louisiana Forestry Association Southern Forest Products Association Louisiana Cooperative Extension Service Louisiana Office of Forestry
Mississippi:	Mississippi Forestry Commission American Pulpwood Association Mississippi Cooperative Extension Service Mississippi State University, Dept. of Forestry
North Carolina:	North Carolina Forest Service
Oklahoma:	Oklahoma Department of Agriculture, Forestry Division Oklahoma Cooperative Extension Service Oklahoma Forestry Association Oklahoma State University, Dept. of Forestry
South Carolina:	South Carolina Commission of Forestry South Carolina Forestry Association Clemson University, Dept. of Forestry
Tennessee:	Tennessee Division of Forestry University of Tennessee, Dept. of Forestry, Wildlife, and Fisheries
Texas:	Texas Forest Service Texas Forestry Association Stephen F. Austin State University, School of Forestry Texas A&M University, Dept. of Forest Science Texas Cooperative Extension Service
Virginia:	Virginia Division of Forestry Virginia Polytechnical Institute, School of Forestry
West Virginia:	West Virginia Forest, Inc.

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