

A N N U A L R E P O R T
F A R M F O R E S T R Y E X T E N S I O N W O R K
N O R T H C A R O L I N A

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ANNUAL REPORT

FOREST MANAGEMENT SECTION

AGRICULTURAL PRODUCTION, MANAGEMENT AND NATURAL-RESOURCE USE (III)

1965

Walter M. Keller, In Charge, Forestry Extension
J. C. Jones, Head, Forest Management Extension Section

I. Program Accomplishments

- A. Expansion in industry has resulted in an increased demand for raw materials from North Carolina's forests. These demands are being met through increased harvesting of merchantable wood from commercial forest lands in the state, owned primarily by small individual landowners. It is on these individual woodland ownerships that the Extension forest management staff has concentrated their efforts to increase production and quality of wood fiber on a unit basis.

The application of good forest management practices, such as the control of insects and diseases, timber stand improvement, efficient harvesting techniques and good utilization of wood products removed from the stump are taught. For the landowner to receive instruction, advice, and information, the staff has conducted training meetings

with Extension agents, industrial foresters, held demonstrations and used all methods of mass media communications. Individual assistance has been given to woodland owners whenever it was possible to do so.

This report will deal with the following major objectives:

1. Developing new techniques for, and efficiency in, the harvesting of all forest products and implementing a safety program with the logging industry.

A study in pulpwood harvesting techniques was begun in 1964 with Mr. J. H. Dunn, Jr., of Scotland Neck, and completed during the period of this report. As a result of this study, a new method for loading 5-foot lengths of wood was developed and put into use. Additional changes are being planned in Mr. Dunn's operation. Other loggers have observed Mr. Dunn's system and installed it in theirs. The techniques used in solving the loading problems with Mr. Dunn are being used in other phases of the logging systems.

In the area of logging safety, funds were obtained from the North Carolina Forestry Association and the Eastern North Carolina Lumber Manufacturers' Association to develop a logging safety television show. The

show is being developed on 16 mm black-and-white sound film. This film will be used on WUNC-TV for broadcast at time or times when the maximum audience of woods labor can be reached. Efforts are also being made to get this film on commercial stations through local programming.

The 16 mm film has one advantage that justifies the additional expense in that it may be used in local training sessions for sometime in the future.

Shooting of the film for most of the program was done during 1965, and the format developed. The finishing touches remain to be put onto the film, and the final copy printed. Tentative showing date is mid-April, 1966.

A workshop for loggers and foremen of logging operations was held in June, 1965, by the Extension Forestry Department covering important points on preventative maintenance and field repair of the major makes of tractive power used by North Carolina loggers. Instruction was provided by the Forest Management and Wood Products Sections staff, as well as representatives from the manufacturers of the various tractors.

The instruction was well received by those in attendance, and encouragement for additional programs of a similar nature has come from both logging industry and equipment manufacturers.

Co-operative studies with industry

Two major studies in the area of harvesting were undertaken during the summer of 1965. The first of these was in co-operation with Williams Furniture Company of Sumter, South Carolina, to investigate logging costs of using rubber-tracked crawler-type equipment for harvesting deep hardwood swamps. Williams request for assistance was accommodated because their logging methods had advanced beyond those used on similar operations in North Carolina and because they have extensive woodland holdings in North Carolina.

A student was placed with the company for June, July, and August, 1965. This student was paid and equipped by the company, and his work was under the supervision of the School of Forestry and the Extension Forestry Department.

As a result of this effort, Williams Furniture re-organized their logging crews. This has resulted in a 50 per cent increase in sustained production. The

company also purchased additional logging equipment which has increased the crew's potential to work varying stand types and adapt to adverse weather conditions.

The department co-operated with the Hardwood Research Group in organizing an industry tour of the Williams logging operations on November 9. Invitations were also extended to North Carolina loggers who were engaged in logging similar chances. Six of the largest hardwood logging interests from North Carolina participated in the tour, as well as other North Carolina industries concerned with the growth and use of hardwood timber.

One of the major considerations in hardwood timber management is the stand of lower-quality stems under 10 - 12 inches left after logging the sawtimber. Williams Furniture discussed this problem with us following the summer studies, and a similar inquiry has been made by International Paper Company and Union Bag-Camp Corporation.

A study has been developed in co-operation with the Hardwood Research Group and the School of Forestry to investigate this problem. The student working with Williams worked with the Extension Forestry Department during the first semester of the 1965-1966 school year

developing the study proposal. The study is to be conducted, using the Hardwood Research Group to classify the biological conditions on the areas to be studied and assist in collecting data on the operations. The Extension Forestry personnel will collect the data and do the analysis of data. The School of Forestry is providing student assistance in collection and analysis.

The second effort was the co-operative study with Albemarle Paper Company. Albemarle was interested in determining the best types log-longwood pulpwood loader to meet the requirements of their producers. The study resulted in a well-documented set of production co-efficients for the following machines studied: the hydraulic knuckle-boom loader, a 3/8-yard crane with tongs, a 1/2-yard crane equipped with rock grapples, a rubber-mounted front-end loader, and a heel-boom loader built on a 5/8-yard crane chassis.

The production co-efficients are broken down by diameter classes, log length, and level of operator performance. These can be easily converted to assimilate the loading time per M board feet or per cord in any common southern pine log distribution and assess delays accordingly.

The major advantages of the report are:

- a. It allows a logger to approximate the performance of alternative loader types prior to bringing the machine onto his job.
- b. It allows the operator to compare alternative systems and select the best alternative machines for his needs.
- c. It gives an indication of the changes in the system which will be necessitated by the change and allows advance planning to be done prior to making the change.

Educational efforts

A "Farm Forestry Facts" sheet was prepared dealing with factors affecting stumpage prices, and two local meetings were conducted on the topic, as well as one television show.

Two programs were presented to professional foresters on the quantitative decision-making approach in logging.

Seven other television programs were prepared and presented on subjects of general interest pertinent to logging. The topics covered ranged from the history of

logging in North Carolina through a discussion of the currently used logging methods and the reasons for their application, and ended with a look at logging in the future.

A presentation was made to the Hardwood Research cooperators' meeting covering the scope of the Extension program in logging as related to hardwood management.

This phase of the program was given leadership by Mr. W. B. Stuart.

2. The production of quality hardwood through better management practices

There has been a continuation of the work on the hardwood demonstration areas along the Roanoke River, as well as the establishment of several new demonstration plots.

Some of the most significant demonstrations are the deer exclosures which were installed two ³ years ago. The results from these exclosures indicated that most of the hardwood regeneration problems experienced by landowners along the Roanoke River were due to the overpopulation of the deer herd in these areas. Because of

the dramatic differences inside and outside the enclosures, plus condition of some of the deer themselves, the North Carolina Wildlife Commission has become vitally interested.

The prediction of a dangerously high overpopulation of deer ^{has been borne out} (was borne out this past fall) by the severe crop damage to landowners along the river. ^{omit rest} (The Griffin brothers near Woodville estimated their losses this year to deer would exceed \$6,000.) In addition, there was a sizable die off in the deer herd. Animals collected by the Wildlife Commission were reported to have been in the worst physical condition of any deer collected and taken to the cooperative diagnostic laboratory at Athens, Georgia.)

A cooperative effort between foresters and the wildlife specialist of the Extension Service and personnel of the state Wildlife Commission was made to educate landowners and hunt-club members along the Roanoke River on the desirability of reducing the deer herd by means of either-sex deer hunts. In some areas this was quite successful. ^{omit} (For example, 300 or 400

deer were harvested off a 5000-acre tract near Woodville.) The Wildlife Commission collected data from most of the animals, ^{harvested this year} Another source of information regarding this subject will be the results obtained by Mr. Hugh Fields, Extension wildlife specialist, who is making a study of the effects deer have on the regeneration of bottomland hardwoods.

Another cooperative phase of the hardwood work has been the effort to have the North Carolina Forest Service nurseries grow more hardwood seedlings. These will mainly be bottomland hardwood species and in many cases grown on consignment for companies that are members of the cooperative hardwood research program at North Carolina State University, School of Forestry.

omit Plans for a 10-acre hardwood plantation have been made for a landowner in Lincoln County. This will be the largest planting of this type in the Piedmont of North Carolina by a private landowner. The planting will consist of sweetgum, sycamore, poplar, and tupelo seedlings.

Assistance was given the hardwood management forester of Georgia-Pacific Corporation with the planning and establishment of a 150-acre hardwood-site preparation

and regeneration study. These large areas will be used to determine the best method to be used by this company in future hardwood management programs.

Leadership in this phase of the program was taken by Mr. E. M. Jones.

3. Developing outdoor recreational enterprises where the criteria for successful operations can be met

Wood-using industry's land ownership is relatively extensive in eastern North Carolina. How to best satisfy the public demands for outdoor recreation on these privately owned lands is a perplexing problem confronting the industry.

The alternatives of industry-managed recreation, lease arrangements or public-agency recreation management was the subject of a program presented to the members of the Croatan and Sandhills Chapters of the Society of American Foresters. Membership in these chapters is primarily area and unit foresters of paper and pulp companies. Sixty members were in attendance at the two meetings.

There have been requests for assistance in determining the feasibility of income-producing outdoor recreation enterprises from Anson, Cherokee, Hyde, Jones, Dare,

Gates, Hoke, and Northhampton Counties. The basic resource needs, location, investment needs and opportunities were explained to the interested landowners. An effort was made to get the prospect to take a good, realistic look at the pitfalls, as well as the opportunities, in the field of outdoor recreation. The final decision making was left solely with the interested landowner, but he was provided with all available information which would help him in making the best decision.

Outdoor recreation

Big business is forever conscious of the public image it projects. Often, much adverse publicity directed toward an expanding industry is unjustified. To counteract the unfavorable elements, many industries expend much effort and money. Such is the position of Texas Gulf Sulphur with its multimillion-dollar operation in eastern North Carolina.

Mr. Robert Smith, forest manager for the company's North Carolina lands, contacted the Extension forestry department, requesting assistance in planning a roadside picnic and rest area. There were no public facilities in the area to accommodate the heavy influx of visitors

attracted to the huge phosphate-mining and -processing complex. Plans and specifications were drawn by Mr. Stanton for the 8-acre picnic and rest area. The project has been completed.

Also, Texas Gulf Sulphur had acquired 90 acres of property within the city limits of their headquarters town of Aurora. Even though there are less than 1,000 permanent residents in the town at the present time, company personnel and allied industry employees were expected to increase the population to 15,000 to 30,000 within the next ten years. To meet this mushrooming population's demand for outdoor recreation, Texas Gulf Sulphur has reserved the 90-acre tract for public recreational purposes. Mr. Stanton presented a master plan for the park and recreation area. Sixty of the 90 acres is in woodland bordered on a stream. A loop road has been constructed through the high pine ridge for the convenience of picnicking and youth camping groups. The cleared area is to be developed into a municipal-type playground. A swimming pool, ball fields, tennis courts, and other play areas will be added whenever the population warrants these additions.

Including the land costs, Texas Gulf Sulphur has already an investment of \$125,000 in its public outdoor recreation areas. The additional municipal recreation area complex, to cost over \$100,000, will be underwritten by the company.

This phase of the program was given leadership by Mr. W. M. Stanton.

4. The relationship between soil quality and tree height growth and a sound business approach to forest management

During the last ten years, foresters have put a great deal of effort into programs intended to stimulate private landowners to do forest improvement work. Consequently, a great many forest landowners believe that management practices designed to improve the forest stand are a good investment in a future timber crop. Many, however, have failed to take into account the productive capacity of the soil they are dealing with. Some have invested far more money than they will be able to recover when they consider the interest on the money they have tied up in the future crop. Therefore, a considerable effort has been put forth to educate the forest landowners as a whole, and particularly professional workers and lay leaders who may influence others,

about the importance of considering the soil's productive capacity and counting the costs of forest improvements in a businesslike manner and weighing them against the expected dollar-value return. In January, a television program was presented explaining some of the basic soil physical characteristics and their relationship to tree growth. Emphasis was put upon the fact that trees will grow on many different kinds of soil but they do not grow at the same rate on different kinds of soil.

About this time, work was begun with a church-owned children's home which formerly operated a large dairy and beef cattle farm. Now that they have disposed of all their cattle and do not intend to farm the land, they are trying to decide what they should do with it. Since they do not feel that they should sell this land and they would rather not let it just grow a crop of weeds, they are considering planting pine trees on it. However, before they ventured into such a large undertaking, they needed an economic analysis of what could be expected. A site-index survey was made for them on approximately 250 acres, and an economic analysis was

prepared on the basis of the soil quality, showing what their costs and returns would be over a period of forty or sixty years.

Training sessions, tours, and field days for agricultural workers, Extension agents, and landowners were held to explain the meaning of the term site index and soil physical properties and their influence on tree growth. The importance of the relationship between soil quality and tree growth and the economics of forest production was stressed. These meetings were held in the following counties: Edgecombe, Cumberland, Granville, Lee, Stokes, and in Chatham for a four-county area. (Exhibit A)

In cooperation with the Albemarle Paper Company, information was presented to their company foresters and pulpwood dealers to better inform them concerning the meaning of the term site index and forest management and the importance of considering the soil quality when thinning timber for pulpwood. The first of these training sessions was held May 4 at Durham, with nineteen of their men present. The second one was on the following day, May 5, at Roanoke Rapids, with nineteen

of their men present. The third one, May 6, at Kinston, with seventeen of their men present.

In cooperation with the North Carolina Forest Service, two three-day workshops were conducted for their service foresters to train them concerning soil quality and in determining site index in the field and also in the calculation of the economics of forest management practices in terms of the soil that is dealt with. The first of these sessions was held at Mount Holly, May 11-13. The second session was held in Asheville for the mountain-area foresters, October 12-14, with twelve and fifteen foresters present, respectively.

In cooperation with another staff member, a two-day workshop on the soils, economics, and disease and insect problems of timber production was conducted for the county Extension workers of the East Central District. (Exhibit B) Information was presented, both in the classroom and in the field to better inform these workers of the problems involved and those answers that are available so that they might be better able to assist the timberland owners in their counties in their forest management production problems. (Exhibit C)

During October and November, considerable time was spent in gathering information on the Fraser fir fertilizer demonstration areas after four years of fertilization. Data has been collected that should show if there are any differences between various amounts and kinds of fertilizer in producing, not only height growth but the number of limbs per foot of height produced. Considerable emphasis in the Christmas-tree program has been put on the fact that high-quality trees must be produced. A premium-quality tree must have a large number of branches per foot of height. Therefore, it is important to know whether or not increased production of lateral branches can be stimulated by the application of certain kinds or amounts of fertilizer. It is believed that these demonstration test areas will give some answers and perhaps point in which direction further tests should be conducted.

The main emphasis of the educational campaign to inform timberland owners concerning soil quality and its relationship to the economics of forest management has been placed on training the professional agricultural workers. It is believed that a greater number of forest

landowners can be reached in this manner; and, consequently, more timber owners will be able to realize a greater return on each dollar of investment in forest management practices. Considering the fact of over 200,000 separate forest land ownerships in North Carolina, it is a large task indeed to attempt to influence the management decisions of even a small portion of these. However, if professional agricultural workers can be trained in each county to give timberland owners the information that they need in making sound business decisions in forest management and if the timberland owners can be made aware that such information is available and that it can put dollars in their bank account if they would use it, then a great deal more of this type of effort should be justified.

This phase of the department program was given leadership by Ross S. Douglass in cooperation with all other staff members.

5. Increasing production of quality Christmas trees and developing Christmas-tree markets and marketing techniques

The research committee of the North Carolina Christmas Tree Growers' Association asked for assistance in

preparing a report for their organization concerning the research that is needed on growing Christmas trees. Assistance was given to them in the form of a prepared statement of the present problems in selecting a suitable species for various parts of the state, soils and fertilizer problems, and other aspects of Christmas-tree production. The approach was to point out some of the problems involved and, consequently, some of the answers that are needed that are presently not available from research that has been done in the past. This information was incorporated into the committee's report and was adopted by the Association. They are planning some action toward getting some research on some of the problems started.

Two-day workshops were conducted for each of two groups of county Extension workers in the mountain area on Christmas-tree production problems and practices. About half of this was conducted in the classroom, with the other half in the field. A total of twenty-eight county workers attended.

At the summer meeting of the North Carolina Christmas Tree Growers' Association, August 12, information

was presented from a three-year study on the survival and growth of four grades of Fraser fir seedlings of the same age. This information shows clearly that both survival and growth decline with the decline in the grade of the seedling.

Work was continued on the five fertilizer demonstrations begun in the spring of 1962, and also on several other demonstrations on weed control and methods of establishing Christmas-tree plantations, both in cutover land and in open land. As a part of this educational program, the use of the mist blower in applying herbicides to eradicate undesirable woody growth in Christmas-tree plantations and to control the blackberry briars which so frequently thrive in old fields and cleared areas has been demonstrated and explained repeatedly, and result demonstrations have been established. A new idea was presented in a weed control demonstration established in September to see if the chemical applied would be able to control weed growth in the spring following.

Assistance was given to Russell Beutel in Jackson County in the sales promotion of his Fraser fir planting

stock. This privately owned commercial nursery transplanted about 500,000 2-2 stock in 1965 to be offered for sale to growers during the 1966 planting season as 3-2 stock. This is quite a valuable supplement to the North Carolina Forest Service nursery, whose available stock was not nearly adequate to fulfill the growing demand by Christmas-tree producers.

Assistance was given a landowner in selecting a site for a nursery. He hopes to be in production next year and have Christmas-tree planting stock for sale within three to five years. This operator plans to reach a production of a million Fraser fir annually, plus other Christmas-tree planting stock to a limited extent.

Balled-and-bagged trees, representing a sizable supplement to the Christmas-tree industry, were in heavy demand again this year. This estimated 1/4-million-dollar business is likely to continue to grow for some time to come.

If North Carolina Christmas-tree producers are to compete at the retail markets, they must take full advantage of their strong points. Quality must be stressed.

To emphasize this, meetings were held in Henderson, Swain, Jackson, Clay, Cherokee, Mitchell, and McDowell Counties. Interest in this phase of Extension teaching is shown by the fact that thirty-one people attended two of these demonstrations during a steady rain.

To promote the use of fresh, high-quality trees, newspapers, radio and television were used. A special program was presented on the university educational channel. A television news interview with a forestry specialist was exhibited during prime-time news and late evening news by two television stations covering nearly half the state.

This phase of the program was given leadership by Mr. F. E. Whitfield, with assistance from other members of the staff.

B. Case Histories

The Extension Forestry Department has provided the leadership for a program of "Keep Onslow County Green" which has been most effective in forest fire prevention in the area. There has also been a noticeable increase in the early reporting of those incendiary fires which escape the trash-burning homeowners. The annual program was started

in 1957, and has been directed primarily to the approximately 500 vocational agriculture students in the county. Adults are also encouraged to participate.

Forest industries, who own extensive forest land in the county, have been enthusiastic about the "Keep Green" program's educational results. The costs of the program are underwritten by the industries, and this expenditure is rather large in terms of professional personnel man-hours contributed, as well as school-bus travel costs.

The "Keep Onslow County Green" program is set up on a four-year rotation plan to make certain that each vocational agriculture student is made aware of the total forestry process. In-the-forest instruction on the many management problems the forest owner is confronted with is conducted on the 80,000-acre North Carolina State University's Hofmann Forest. A very impressive display of fire control by the use of water and chemicals dropped from the North Carolina Forest Service planes on a pre-set fire is very effective. A conducted tour of a tree nursery, a pulp and paper mill, a veneer mill and a large sawmill is part of the agenda of the four-year rotation.

The "Keep Green" program is a very fine example of

cooperation between Extension foresters, industry foresters, and North Carolina Forest Service foresters.

Mrs. Roy Chesson, of Roper in Washington County, realized an additional \$3,500 from her timber sale through the efforts of her county agent and the Extension forester.

Mrs. Chesson, whose husband had died early in the year, had requested assistance through her county agent on how best to sell her timber.

Examination of the 14-acre tract by the Extension forester revealed that the pine timber had reached economic maturity. There were also enough trees with height and quality to justify a pole and piling sale. Also, there was a scattering of premium veneer poplar trees.

In a conference with Mrs. Chesson, she stated that before the death of her husband he had been offered \$6,000 for the tract. The Extension forester explained the best method of selling her timber and supplied her with a list of sawlog buyers and piling buyers in the area. He also explained the tax advantage of getting part payment the year her husband had died since she was eligible to file a joint income tax return. He advised delaying the cut until after seed ripening for assurance of a better chance of regeneration on the area.

Mrs. Chesson happily reported to the county agent that she had received \$1,000 from a piling sale. The remaining sawlogs were sold to the highest reliable bidder, whose sawmill was seventy miles away, for \$8,500. This was a return of \$9,500, or \$3,500 more than her late husband's expected sale.

Mr. Rudolph Respass, of the Wenona section of Washington County, contacted his county agent regarding the source of loblolly pine seed. He had extensive land holdings in this coastal part of the state where high organic, high peat content and often-burned soils were predominant. Mr. Respass has been successful in developing this type soil into productive corn and soybean cropland. However, his extensive open land was subject to soil loss and crop damage due to wind erosion. The pine seed request was for the purpose of planting a 100-acre windbreak.

The county agent contacted the Extension forester regarding the feasibility of the seed procurement, as well as the feasibility of seeding. Being familiar with the area, the Extension forester suggested a one-acre trial demonstration before expending the approximate \$1,000 for seeding the 100 acres. Repeated burns had left a fairly thick layer of

ash, and the Extension forester had doubts as to successful germination on this type seedbed.

A pound and a half of scarified, treated seed were sown on a measured-acre demonstration plot. The plot was checked after an adequate period for germination, and not one seedling was found.

Mr. Respass is now willing to follow the Extension forester's recommendations of exposing the mineral soil by disking before seeding or planting seedlings on the berm of his ditchbanks.

This phase of the program was given leadership by Mr. William Stanton.

FOUR-COUNTY FOREST MANAGEMENT DEMONSTRATION

Howard Butler Forest Property

Chatham County

October 21, 1965

Cooperating Sponsors:

Riegel Paper Corporation
Piedmont Woodyards
General Creosoting Company
Albemarle Paper Manufacturing
Company
North Carolina Agricultural
Extension Service

Stop #2 - Upland Hardwood Conversion

Area in demonstration plot ---- .4 acre

(All data from this point on is converted to and given on a per acre basis.)

Information

1/2 gallon 2,4,5-T required per 100" D.B.H. treated
 Cost of 2,4,5-T figured at 50¢ per gallon (1-to-25 mixture)
 1/2 man-hour labor required per 100" D.B.H. treated
 Cost of labor figured at \$1.25 per hour

Cost of Chemically Treating and Hand Planting This Acre

2,850 inches of D.B.H. to be treated would require:

14 1/4 man-hours @ \$1.25 per hour ----- \$17.81
 14 1/4 gallons of 2,4,5-T @ 50¢ per gallon -- 7.13
 Total cost of chemical treatment -- \$24.94
 Cost of hand planting (including seedlings) -- 20.00
 Total conversion cost ----- \$45.00

Expected Returns from 20-Year - 40-Year Rotations

(Based on Site Index 90 for loblolly pine)

20-Year Rotation

:Present worth of \$185.50

:figured at several rates

Volume Yield Value : of compound interest

Pulpwood --- 15.5 cords @ \$5/cord	\$ 77.50:	4% C.I. ----	\$85
Sawtimber -- 3.6 MBF @ \$30/MBF	<u>108.00:</u>	6% C.I. ----	58
Total	\$185.00:	8% C.I. ----	40

40-Year Rotation

:Present worth of \$704

:figured at several rates

Volume Yield Value : of compound interest

Pulpwood --- 2.8 cords @ \$5/cord	\$ 14.00:	4% C.I. ----	\$147
Sawtimber -- 23 MBF @ \$30/MBF	<u>690.00:</u>	6% C.I. ----	67
Total	\$704.00:	8% C.I. ----	32

Stop #3 - Final Thinning

- I. Kind of timber - Loblolly and shortleaf pine
- II. Age - 46 years
- III. Total height of best trees - 85 feet. This height growth indicates that this land is above average in quality for growing pines under Piedmont conditions.
- IV. Past history - This is a volunteer stand which seeded in naturally on this abandoned field in 1919 and 1920. It was never cut through until 1961.

The 1 acre enclosed by string was thinned for pulpwood.

- V. Timber volume and value at time of 1961 harvest - The following standing-timber prices were assumed in placing a value on this acre:

Pine and poplar sawtimber:

\$30 per thousand board feet as estimated by International
1/4-inch log rule

Pine pulpwood:

Cut from standing trees in pulpwood thinning - \$5.00 per
standard cord of 128 cubic feet
Cut from sawtimber and pole tops - \$2.00 per cord

Pine poles:

60% of price of peeled poles loaded on trucks, September 11, 1961 price list of General Cresoting Company

- A. Volume and value per acre based on sawtimber cut to 10-inch-stump diameter. Smaller trees and tops cut into pulpwood.

13,400 board feet of sawtimber -----	\$402.00
17.6 cords pulp from standing trees -----	88.00
6.0 cords pulp from tops -----	12.00
Total value per acre -----	\$502.00

- B. Volume and value per acre selling all trees suitable for poles as poles. Remaining trees above 10 inches stump diameter sold for sawtimber. Remaining trees below 10 inches stump diameter plus tops from pole and sawtimber sold for pulpwood.

Stop #3, continued

105 poles -----	\$371.91
1,720 board feet of sawtimber -----	51.60
17.6 cords pulp from standing trees ---	88.00
6.0 cords pulp from tops -----	12.00
Total value per acre -----	\$523.51

- C. Volume and value per acre selling trees for poles only when pole price is higher than sawtimber price. Remaining trees above 10 inches stump diameter sold for sawtimber. Remaining trees below 10 inches stump diameter plus tops from pole and sawtimber trees sold for pulpwood.

64 poles -----	\$272.58
6,572 board feet of sawtimber -----	197.16
17.6 cords pulp from standing trees ---	88.00
6.0 cords pulp from tops -----	12.00
Total value per acre -----	\$569.74

- VI. The 1961 thinning - The poorly formed, slowest-growing trees were marked and sold on the stump for pulpwood.

The harvest and income from this improvement operation:

16.7 cords pulpwood -----	\$ 83.50
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125 of the best-formed, best-growing trees were reserved for growth and future sale. Spacing was improved.

- VII. Value of the reserved trees in 1971 based on 1961 standing-timber prices - Based on borings made in 7 representative reserved trees.

The following volumes and values were estimated by the year 1971:

- A. Based on sawtimber and pulpwood only

19,600 board feet of sawtimber -----	\$588.00
8.6 cords of pulp from tops -----	17.20

Value per acre, 1971 -----	\$605.20
Value in 1961 of reserved trees -----	418.50

10-year increase per acre -----	\$188.70
Increase per year per acre -----	18.87
Percent increase per year on present timber value -----	4.5%

Stop #3, continued

B. Based on estimated pole value plus pulpwood from tops in 1971

124 poles -----	\$909.94
8.6 cords pulp from tops -----	<u>17.20</u>
Value per acre in 1971 -----	\$927.14
Value of reserved trees in 1961 -----	\$440.00
10-year increase per acre -----	\$487.14
Increase per year per acre -----	\$ 48.71
Percent increase per year on present timber value -----	11%

Stop #4 - Pole and Pulpwood Combination Thinning

I. Kind of timber - Loblolly pine

II. Age - 41 years

III. Total height of best trees - 90 feet. This height growth is well above average due to the fact that part of the area is bottomland.

IV. Past history - This is a volunteer stand which seeded in naturally in 1924 and 1925.

V. Timber volume and value at time of 1961 harvest based on standing-timber prices as follows:

Pine sawtimber:

\$30.00 per thousand board feet as estimated by International 1/4-inch log rule

Pine pulpwood:

Cut from standing trees in pulpwood thinning - \$5.00 per standard cord of 128 cubic feet

Cut from sawtimber and pole tops - \$2.00 per cord

Pine poles:

60% of price of peeled poles loaded on trucks if clearcut.

September 11, 1961 price list of General Creosoting Company.

A. Value per acre if clearcut all trees above 10 inches stump diameter for sawtimber. Clearcut all trees below 10 inches stump diameter for pulpwood. Cut pulpwood from tops of sawtimber trees.

Stop #4, continued

21,000 board feet of sawtimber -----	\$630.00
10.8 cords pulp from standing trees ---	54.00
11 cords pulp from sawtimber tops -----	<u>22.00</u>
Value per acre, 1961 -----	\$706.00

- B. Value if clearcut all trees suitable for poles and sell for poles. Clearcut remaining trees above 10 inches stump diameter and sell for sawtimber. Clearcut all smaller trees for pulp. Cut pulp from pole and sawtimber tops.

225 poles -----	\$444.60
5,700 board feet of sawtimber -----	171.00
10.8 cords pulp from standing trees ---	54.00
11 cords pulp from pole and sawtimber tops -----	<u>22.00</u>
Value per acre, 1961 -----	\$691.60

- C. This 1/4 acre was marked like the first one and then cut into poles. Pulpwood was cut from pole tops and marked trees not suitable for poles.

The harvest on this 1/4 acre was as follows:

23 poles -----	\$ 20.35
2.7 cords of pulpwood from standing trees -----	13.50
1.1 cords of pulpwood from pole tops --	<u>5.50</u>
Total thinned harvest value per 1/4 acre -----	\$ 39.35
Total thinned harvest value per acre --	\$157.40

50 of the best trees on the 1/4 acre were reserved to grow for future income. This amounts to 200 trees per acre.

If all marked trees had been cut into pulpwood only, the volume and value of the thinned harvest per acre would have been as follows:

23.1 cords of pulpwood from standing trees -----	\$115.50
--	----------

Thus there is a gain of \$41.90 per acre in selling poles and pulpwood in this thinning compared to selling all marked trees for pulpwood only.

Stop #5

I. Kind of timber - Shortleaf and loblolly pine

II. Age - 45 years

III. Total height of best trees - 75 feet

IV. Another volunteer stand seeded in about 1920

V. Thinned winter-spring, 1965-66

This 1/4 acre was marked like the first one and then cut into poles. Pulpwood was cut from poles and marked trees not suitable for poles.

The harvest on this 1/4 acre was as follows:

\$ 30.35	-----	23 poles
13.80	-----	2.7 cords of pulpwood from standing trees
<u>4.50</u>	-----	1.1 cords of pulpwood from pole tops
		Total thinned harvest value per 1/4 acre
\$ 30.35	-----	
<u>\$17.60</u>	-----	Total thinned harvest value per acre

50 of the best trees on the 1/4 acre were reserved to grow for future income. This amounts to 200 trees per acre.

If all marked trees had been cut into pulpwood only, the volume and value of the thinned harvest per acre would have been as follows:

\$11.50	-----	23.1 cords of pulpwood from standing trees
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Thus there is a gain of \$41.50 per acre in selling poles and pulpwood in this thinning compared to selling all marked trees for pulpwood only.

PROPOSAL FOR IN-SERVICE TRAINING

Insect, Disease, Soil and Economic Problems
of Tree Growth and Timber Production
(Title of Proposed Training)

Submitted by:

Walter M. Keller	In Charge, Forestry Extension	8/23/65
Ross S. Douglass	Forest Management Extension Specialist	8/23/65
Fred E. Whitfield	Forest Management Extension Specialist	8/23/65

Action taken by: Extension Administration

Approved by:

(Name)

(Title)

(Date)

II. NATURE OF TITLE OF PROPOSED TRAINING

The proposed training includes problems and current knowledge of insects and diseases of trees, soil productivity, economic analysis in forest management, and forest recreation.

III. SITUATION AND SUPPORT FOR PROPOSED TRAINING

The number of requests from timberland owners and homeowners for assistance with insect and disease problems of trees has steadily increased in recent years. It appears that this is a part of the increasing demand of urban people for the services of Extension personnel. County Extension workers should be able to recognize some of the more common insects and diseases of trees and to advise on their control.

In recent years, many people with investment capital have purchased and/or improved forest lands as an investment. Industry activities and various educational efforts have spread the idea that growing timber is a good investment. Often, considerable amounts of money are required to be invested for long terms in this business. Many have neglected to consider that trees do not grow equally well on all soils. Consequently, some have invested too heavily on poor soils and others have been hesitant to spend heavily enough on better soils.

By examining the physical characteristics of the soil, it can be predicted readily and fairly accurately how much volume of marketable timber will be produced on a given soil by a certain species of tree in a given length of time. Thus, dollar values can be reasonably anticipated.

The only sound business approach to investments in timber production is to weigh all costs, including interest, against returns and compare the results to other possible investments.

County Extension workers should be capable of advising about soil adaptability for tree growth. Likewise, they should be competent to guide in the economic analysis of forest management practices. At least they should be aware of the need for this type of information and be able to help inquirers find the right person to assist them with the necessary technical details.

IV. IDENTIFICATION OF TRAINING PARTICIPANTS

Extremely few county Extension workers are now competent to determine the capacity of soil to produce timber or to advise as to how the problems of timber-production investments should be approached. Most of them are not even aware of the need for this information.

Few county workers have had adequate training to correctly diagnose insect and disease problems of trees, or to advise on controls.

It is intended that the person who does forestry work in each county attend this training.

V. PROPOSED PROGRAM CONTENT

First day

9:30 - Tree-killing insects - their identification and control.
Diseases that kill or seriously reduce tree growth or value.
Field trip on tree insects and diseases.

Second day

Insects and fungi which attack wood in use.
Soil layers - their origin, identification and significance.
Drainage and soil-aeration effects on tree growth.
Measuring soil capability to grow trees.
Field trip on forest-soils characteristics.

Third day

Recreation and income opportunities for forest landowners.
Nuisance insects and diseases of trees.
Electric charges on soil particles and their significance concerning plant growth.
Economics of long-term forest-management investments.
Classroom problem on soils-economics instruction.

3:30 adjourn

VI. OBJECTIVES OF PROPOSED TRAINING

We do not propose to make entomologists or pathologists of these workers, but we believe that they can be given enough basic information so that they can recognize the more

common pests of trees and advise on their control. This training is oriented toward this purpose.

It is intended to acquaint county workers with a simple method of determining soil capacity to grow trees and the elementary economics of investments in timber production. As a result we do not expect these people to be expert economic analysts. We do expect that they will be sufficiently aware of the opportunities and pitfalls to recognize and assist with fundamental problems, and to guide those interested to further professional help where it is needed.

VII. DEPARTMENTS TO BE INVOLVED IN PLANNING AND CONDUCTING THE PROPOSED TRAINING

Only Forest Management Extension personnel will be involved in planning and conducting this training.

VIII. PROPOSED PLAN FOR EVALUATING THE LEVEL OF PERFORMANCE OF EACH PARTICIPANT

Evaluation will be accomplished by written quiz on insects and diseases, observation of participation, and the classroom problem on soils-economics instruction.

IX. PLANS FOR FOLLOW-UP WORK WITH PARTICIPANTS

It is planned to follow up this training with individual contacts as time permits and with further training two or three years hence to supplement this training.

X. ADDITIONAL INFORMATION

A. A minimum of one participant per county. This would normally be the person designated to do forestry work in the county.

B. Three days are needed for this training.

C. Preferred dates:

Northwestern District	-- September 14, 15 and 16
Southwestern District	- September 21, 22 and 23
Northeastern District	- September 28, 29 and 30
Southeastern District	- October 19, 20 and 21
East Central District	- October 26, 27 and 28
Western District	- June, 1966 - dates to be set later

D. Training is to be conducted at the following places:

Northwestern District - Betsy-Jeff Penn 4-H Camp
Southwestern District - Montgomery County
Northeastern District - Halifax County (Albemarle
Paper Company facilities -
tentative)
Southeastern District - Sampson County
East Central District - North Carolina State University
Western District - Asheville

E. The estimated cost is \$40 per participant.

EXTENSION AGENTS IN-SERVICE TRAINING
INSECT, DISEASE, SOIL AND ECONOMIC PROBLEMS
OF TREE GROWTH AND TIMBER PRODUCTION
EAST-CENTRAL DISTRICT

September 28, 29, & 30, 1965

Tuesday

- 9:30 Tree killing insects - their identity and control
- 12:30 Diseases that kill or seriously reduce tree growth
or value
- 2:00
to Field trip on tree insects & diseases
5:00

Wednesday

- 8:00 - 9:00 Insects & Fungi attacking wood in use
- 9:00 - 10:00 Soil layers - their origin, identification, &
significance
- 10:00 - 11:00 Drainage & aeration effects on tree growth
- 11 to 12 Soil site index
- 1:30 - 5:00 Field trip on Forest soils

Thursday

- 8:00 - 9:00 Recreation & Income opportunities for forest landowners
- 9:00 - 10:00 Nuisance insects & diseases of trees
- 10:00 - 11:00 C.E.C. & its significance in plant growth
- 11:00 - 12:00 Economics of long-term forest management investments
- 1:30 - 3:30 Problem