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Research Report No. 21, A Fortran Computer Program for Estimating Yield of East Texas Pine Plantations

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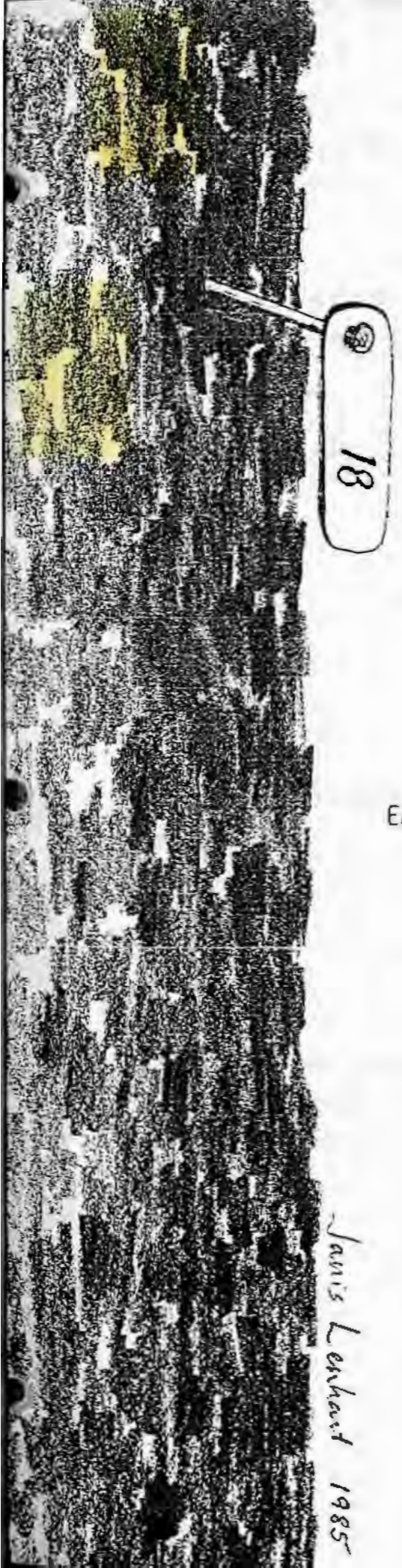

A FORTRAN COMPUTER PROGRAM FOR ESTIMATING YIELD OF EAST TEXAS PINE PLANTATIONS

by
J. David Lenhart

REPORT NUMBER 21

TO

PARTICIPATING COMPANIES

IN THE

EAST TEXAS PINE PLANTATION RESEARCH PROJECT

A STUDY OF

LOBLOLLY AND SLASH PINE PLANTATIONS

IN

EAST TEXAS

CENTER FOR APPLIED STUDIES
SCHOOL OF FORESTRY
STEPHEN F. AUSTIN STATE UNIVERSITY
NACOGDOCHES, TEXAS 75962

APRIL, 1988

This is the twenty-first in a continuing series of reports describing results from the East Texas Pine Plantation Research Project.

Subject and content of each ETPPRP report is regional in scope and of particular interest to loblolly and slash pine plantation owners in East Texas.

Any suggestions, ideas or comments will always be welcomed.

* * * * * * * * *

Support from the participating companies...
Champion International Corporation,
International Paper Company,
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is gratefully appreciated.

* * * * * * * * *

Author is Professor, School of Forestry, SFASU.

Two additional computer programs for yield prediction will be published as ETPPRP reports later this year. One is being written in BASIC for IBM PCs, and the other will be a HYPERCARD stack for the MACINTOSH.

J. David Lenhart
Project Director
April 25, 1988

A FORTRAN COMPUTER PROGRAM FOR ESTIMATING YIELD OF EAST TEXAS PINE PLANTATIONS

by

J. David Lenhart
School of Forestry, SFASU, Nacogdoches, TX 75962

ABSTRACT. A computer program for estimating per acre yield for loblolly and slash pine plantations in East Texas is presented. The interactive program, DIAYLDSUR, is written in FORTRAN and is designed to run on a main-frame computer. An option in DIAYLDSUR allows the user to impose mortality rates on the pine plantations for both fusiform rust infected tree stems and disease-free stems.

INTRODUCTION

Yield information is useful to East Texas pine plantation managers. Data on tree production can be combined with other resource information, such as wildlife and recreation, and included in appraisal analysis to determine management plans for the pine plantations that maximize specific measures of utility.

To assist plantation managers in estimating timber production from their stands, a yield prediction program written in FORTRAN for large main-frame computers has been developed as part of the East Texas Pine Plantation Research Project. Previously reported mensurational results from the ETPPRP are incorporated into the computer program--DIAYLDSUR.

DIAYLDSUR is a diameter distibution yield prediction program. Information on plantation age, site index and surviving trees per acre plus mortality rates (if desired) is inputted. For each combination of age, site index and trees per acre, output from the program presents stand structure (trees per acre basal area per acre) and yield (volume and weight per acre in total stem) by diameter class.

DIAYLDSUR is on the SFASU computer and available for use. There are at least four possible ways to obtain/access the program:

1. Use BITNET to copy the program from the SFASU computer to your computer.
2. If you have an account on the SFASU computer, copy the program to your account.
3. Copy the program to your tape and return the tape to you.
4. Obtain a listing of the program and type it into your computer (Whew!).

For help and assistance please contact the author (409-568-3301).

REQUIRED INPUT TO DIAYLDSUR

DIAYLDSUR is an interactive program, so you must respond to questions appearing on your terminal screen. The steps to follow in order to obtain yield predictions are:

1. After logging into your account where DIAYLDSUR resides, at least three SET commands are required:
   a. SET 103 ME (note: program writes to your terminal screen.)
   b. SET 104 ME (note: program accepts your keyboard responses.)
   c. SET 108 LP (note: where the answers are to go.)

   Various computer systems may require different procedures.

2. Begin execution of the program.

   NOTE: As you and the program correspond, no checks for illogical values are made by DIAYLDSUR. That is your responsibility. However, you do have opportunities to verify and modify your input before yield tables are calculated.

3. Program asks you to select a species - loblolly or slash.

4. Program asks you to set up a site index loop. Site index values should be within a range of 40-80 feet. Outside of that range will exceed the data range.

5. Program asks you to set up a trees per acre loop. Trees per acre values should be within a range of 200-800. Outside of that range will exceed the data range.

6. Program asks you to set up a plantation age loop. Age values should be within a range of 4-20 years. Outside of that range will exceed the data range.

7. Program tells you how many pages of output will be produced by the three plantation parameter loops. If not okay, you may change the loops.

8. Program asks you if mortality should be included in the yield tables.
   a. If not, the yield tables are computed.
   b. If yes, program asks you to specify the percentage of the trees at initial age with fusiform rust galls on the stem. Then, the yield tables are computed.

MENSURATIONAL COMPONENTS IN DIAYLDSUR

All mensurational systems were developed by the ETPPRP, using data from ETPPRP permanent plots throughout East Texas. Except for the Weibull parameter recovery procedure, which was developed at VPI&SU.

SITE INDEX

Uses equations developed by Blackard as part of his MSF thesis and reported in

Blackard, J. A. 1985. Estimating site index. ETPPRP Report No. 3. School of Forestry. SFASU. 10 p.

Lenhart, J. D., E. V. Hunt, Jr. and J. A. Blackard. Site index equations for loblolly and slash pine plantations on non-old-fields in East Texas. So. J. Appl. For. 10(2):109-112.

MORTALITY

Uses equations developed by Lenhart and Hackett and reported in

Lenhart, J. D. and T. L. Hackett. 1988. Estimating survival for East Texas Pine Plantations. ETPPRP Report No. 19. School of Forestry. SFASU. 12 p.

INDIVIDUAL TREE HEIGHT

Uses equations developed by Dixon and reported in

Dixon, C. R. 1987. Predicting individual tree height of planted loblolly and slash pines in East Texas, update: 1987. ETPPRP Report No. 15. School of Forestry. SFASU. 8 p.

INDIVIDUAL TREE CONTENT

Uses equations developed by Lenhart, Blackard, Wiswell, Hackett (part of his MSF thesis) and Laman (part of his MSF thesis) and reported in

Wiswell, T. J., J. A. Blackard and J. D. Lenhart. 1986. Estimating the cubic foot volume of individual loblolly pine trees planted in East Texas. ETPPRP Report No. 5. School of Forestry. SFASU. 11 p.

Wiswell, T. J., J. A. Blackard and J. D. Lenhart. 1986. Estimating the green weight of individual loblolly pine trees planted in East Texas. ETPPRP Report No. 6. School of Forestry. SFASU. 10 p.

Hackett, T. L. 1986. Estimating the cubic foot volume of individual slash pine trees planted in East Texas. ETPPRP Report No. 8. School of Forestry. SFASU. 11 p.

Laman, C. J. 1986. Estimating the green weight of individual slash pine trees planted in East Texas. ETPPRP Report No. 9. School of Forestry. SFASU. 11 p.

Lenhart, J. D., T. L. Hackett, C. J. Laman, T. J. Wiswell and J. A. Blackard. 1987. Tree content and taper functions for loblolly and slash pine trees planted on non-old-fields in East Texas. So. J. Appl. For. 11(3):147-151.

RECOVERING WEIBULL PARAMETERS

Uses methods and equations developed by Burk, Burkhart and Lenhart and reported in

Burk, T. E. and H. E. Burkhart. 1984. Diameter distributions and yields of natural stands of loblolly pine. FWS-1-84. Div. of For. and Wild. Resources. VPI&SU. 22 p.

Lenhart, J. D. 1987. Stand structure and yield of slash pine plantations in East Texas, update: 1987. ETPPRP Report No. 17. School of Forestry. SFASU. 23 p.

Lenhart, J. D. (In press) Diameter distribution yield prediction system for unthinned loblolly and slash pine plantations on non-old-fields in East Texas. So. J. Appl. For.

EXAMPLE YIELD TABLES

On the next 12 pages are examples of yield tables produced by DIAYLDSUR for four different situations of managing East Texas pine plantations. For each stand, site index is 60 feet, initial trees per acre at age 8 years is 400 and the trees are grown until 12 years old.

1. A loblolly pine plantation with no mortality.

2. A loblolly pine plantation with 20% of the trees at age 8 with fusiform rust galls on the stem. Mortality is calculated.

3. A slash pine plantation with no mortality.

4. A slash pine plantation with 20% of the trees at age 8 with fusiform rust galls on the stem. Mortality is calculated.

By evaluating the performance of the East Texas pine plantations, the manager can make decisions on some timber activities and operations, such as when to thin and when to have a final harvest.

PREDICTED
STAND STRUCTURE
PLUS
VOLUME AND WEIGHT PER ACRE BY DBH CLASS
FOR
LOBLOLLY PINE PLANTATIONS
ON
NON-OLD-FIELDS IN EAST TEXAS.

****
* AGE = 8 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
*TREES PER ACRE = 400 SURVIVING AT AGE 8 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 22 FEET.
2) ARITHMETIC MEAN DBH = 3.09 INCHES.
3) QUADRATIC MEAN DBH = 3.24 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	15	0	11	0	20	0	8	1
2	101	2	14	14	669	9	287	2
3	153	8	17	56	2775	39	1196	3
4	99	9	19	72	3548	51	1534	4
5	29	4	21	36	1794	26	777	5
6	3	1	22	6	277	4	120	6
7	0	0	0	0	0	0	0	7
8	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	24		184	9083	129	3922	

EAST TEXAS PINE PLANTATION RESEARCH PROJECT
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PREDICTED
STAND STRUCTURE
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VOLUME AND WEIGHT PER ACRE BY DBH CLASS
FOR
LOBLOLLY PINE PLANTATIONS
ON
NON-OLD-FIELDS IN EAST TEXAS.

```
**********************************************
*         AGE = 10 YEARS SINCE ESTABLISHMENT  *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS)   *
*TREES PER ACRE =  400 SURVIVING AT AGE 10    *
**********************************************
```

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 29 FEET.
2) ARITHMETIC MEAN DBH = 4.28 INCHES.
3) QUADRATIC MEAN DBH = 4.44 INCHES.

PER ACRE VALUES

DBH (IN)	STRUCTURE: NUMBER OF TREES	STRUCTURE: BASAL AREA (SQFT)	STRUCTURE: AVG IND. TREE HT (FT)	VOLUME & WEIGHT - TOTAL STEM: WOOD & BARK: VOLUME (CUFT)	WOOD & BARK: GREEN WEIGHT (LBS)	WOOD ONLY: VOLUME (CUFT)	WOOD ONLY: DRY WEIGHT (LBS)	DBH (IN)
1	1	0	13	0	2	0	1	1
2	24	1	17	4	204	3	88	2
3	83	4	21	38	1977	27	852	3
4	126	11	23	112	5778	81	2496	4
5	105	14	25	158	8136	116	3522	5
6	49	10	27	114	5895	85	2556	6
7	12	3	29	41	2111	31	917	7
8	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	43		467	24103	343	10432	

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PREDICTED
STAND STRUCTURE
PLUS
VOLUME AND WEIGHT PER ACRE BY DBH CLASS
FOR
LOBLOLLY PINE PLANTATIONS
ON
NON-OLD-FIELDS IN EAST TEXAS.

AND
MORTALITY ASSOCIATED WITH
FUSIFORM RUST INFECTED STEMS AND
DISEASE-FREE STEMS
IS INCLUDED.

****
* AGE = 10 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
* CLEAR T/A = 316 SURVIVING AT AGE 10 *
* INFECTED T/A = 73 SURVIVING AT AGE 10 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 29 FEET.
2) ARITHMETIC MEAN DBH = 4.30 INCHES.
3) QUADRATIC MEAN DBH = 4.45 INCHES.

PER ACRE VALUES

DBH (IN)	STRUCTURE: NUMBER OF TREES	STRUCTURE: BASAL AREA (SQFT)	STRUCTURE: AVG IND. TREE HT (FT)	VOLUME & WEIGHT - TOTAL STEM: WOOD & BARK: VOLUME (CUFT)	WOOD & BARK: GREEN WEIGHT (LBS)	WOOD ONLY: VOLUME (CUFT)	WOOD ONLY: DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	22	0	17	4	187	2	80	2
3	79	4	20	34	1767	24	761	3
4	122	11	22	103	5283	74	2282	4
5	103	14	24	148	7571	108	3278	5
6	49	10	26	110	5615	82	2435	6
7	12	3	28	39	2018	30	876	7
8	1	0	29	4	226	3	98	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	389	42		442	22657	323	9810	

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DISEASE-FREE STEMS
IS INCLUDED.

****
* AGE = 8 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
* CLEAR T/A = 320 SURVIVING AT AGE 8 *
* INFECTED T/A = 80 SURVIVING AT AGE 8 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 22 FEET.
2) ARITHMETIC MEAN DBH = 3.09 INCHES.
3) QUADRATIC MEAN DBH = 3.24 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	15	0	11	0	20	0	8	1
2	101	2	14	14	669	9	287	2
3	153	8	17	56	2775	39	1196	3
4	99	9	19	72	3548	51	1534	4
5	29	4	21	36	1794	26	777	5
6	3	1	22	6	277	4	120	6
7	0	0	0	0	0	0	0	7
8	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	24		184	9083	129	3922	

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AND
MORTALITY ASSOCIATED WITH
FUSIFORM RUST INFECTED STEMS AND
DISEASE-FREE STEMS
IS INCLUDED.

****
* AGE = 12 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
* CLEAR T/A = 304 SURVIVING AT AGE 12 *
* INFECTED T/A = 65 SURVIVING AT AGE 12 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 35 FEET.
2) ARITHMETIC MEAN DBH = 5.17 INCHES.
3) QUADRATIC MEAN DBH = 5.33 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	5	0	19	1	49	1	21	2
3	34	2	22	16	860	12	370	3
4	79	7	25	77	4035	56	1742	4
5	105	14	28	178	9417	133	4075	5
6	87	17	30	227	11991	172	5197	6
7	44	12	32	166	8791	128	3816	7
8	13	5	34	68	3604	53	1566	8
9	2	1	35	14	717	11	312	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	369	58		747	39464	566	17099	

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PREDICTED
STAND STRUCTURE
PLUS
VOLUME AND WEIGHT PER ACRE BY DBH CLASS
FOR
SLASH PINE PLANTATIONS
ON
NON-OLD-FIELDS IN EAST TEXAS.

****
* AGE = 8 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
*TREES PER ACRE = 400 SURVIVING AT AGE 8 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 24 FEET.
2) ARITHMETIC MEAN DBH = 3.42 INCHES.
3) QUADRATIC MEAN DBH = 3.56 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	5	0	10	0	7	0	3	1
2	66	1	14	10	328	6	191	2
3	146	7	17	60	1497	38	1172	3
4	128	11	20	107	2261	70	2184	4
5	48	7	22	67	1244	45	1413	5
6	7	1	24	15	251	10	325	6
7	0	0	0	0	0	0	0	7
8	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	27		259	5588	169	5288	

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FOR
SLASH PINE PLANTATIONS
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NON-OLD-FIELDS IN EAST TEXAS.

****
* AGE = 10 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
*TREES PER ACRE = 400 SURVIVING AT AGE 10 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 30 FEET.
2) ARITHMETIC MEAN DBH = 4.27 INCHES.
3) QUADRATIC MEAN DBH = 4.41 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	19	0	15	3	103	2	60	2
3	83	4	18	37	914	23	717	3
4	133	12	21	118	2498	77	2415	4
5	109	15	24	169	3151	114	3585	5
6	45	9	26	106	1784	73	2318	6
7	9	2	28	31	470	22	683	7
8	1	0	30	5	67	3	107	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	42		469	8987	314	9885	

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NON-OLD-FIELDS IN EAST TEXAS.

****
* AGE = 12 YEARS SINCE ESTABLISHMENT *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS) *
*TREES PER ACRE = 400 SURVIVING AT AGE 12 *
****

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 36 FEET.
2) ARITHMETIC MEAN DBH = 4.94 INCHES.
3) QUADRATIC MEAN DBH = 5.09 INCHES.

PER ACRE VALUES

	STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
				WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	5	0	16	1	29	1	17	2
3	43	2	20	21	541	14	425	3
4	101	9	23	100	2126	65	2060	4
5	123	17	26	209	3932	143	4481	5
6	87	17	29	234	3956	164	5151	6
7	34	9	32	135	2099	97	3059	7
8	7	2	34	38	546	28	877	8
9	1	0	36	7	96	5	169	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	400	56		745	13325	518	16239	

EAST TEXAS PINE PLANTATION RESEARCH PROJECT
CENTER FOR APPLIED STUDIES
SCHOOL OF FORESTRY
STEPHEN F. AUSTIN STATE UNIVERSITY

PREDICTED
STAND STRUCTURE
PLUS
VOLUME AND WEIGHT PER ACRE BY DBH CLASS
FOR
SLASH PINE PLANTATIONS
ON
NON-OLD-FIELDS IN EAST TEXAS.

AND
MORTALITY ASSOCIATED WITH
FUSIFORM RUST INFECTED STEMS AND
DISEASE-FREE STEMS
IS INCLUDED.

```
**********************************************
*         AGE = 10 YEARS SINCE ESTABLISHMENT  *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS)   *
*       CLEAR T/A =  318 SURVIVING AT AGE 10  *
*    INFECTED T/A =   73 SURVIVING AT AGE 10  *
**********************************************
```

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 30 FEET.
2) ARITHMETIC MEAN DBH = 4.28 INCHES.
3) QUADRATIC MEAN DBH = 4.42 INCHES.

PER ACRE VALUES

DBH (IN)	STRUCTURE: NUMBER OF TREES	STRUCTURE: BASAL AREA (SQFT)	STRUCTURE: AVG IND. TREE HT (FT)	VOLUME & WEIGHT - TOTAL STEM: WOOD & BARK: VOLUME (CUFT)	WOOD & BARK: GREEN WEIGHT (LBS)	WOOD ONLY: VOLUME (CUFT)	WOOD ONLY: DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	19	0	15	3	103	2	60	2
3	80	4	18	35	881	22	691	3
4	130	11	21	115	2441	75	2360	4
5	107	15	24	166	3093	112	3519	5
6	45	9	26	106	1784	73	2318	6
7	9	2	28	31	470	22	683	7
8	1	0	30	5	67	3	107	8
9	0	0	0	0	0	0	0	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL:	391	41		461	8839	310	9738	

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DISEASE-FREE STEMS
IS INCLUDED.

```
**************************************************
*         AGE = 12 YEARS SINCE ESTABLISHMENT     *
* SITE INDEX = 60 FEET (INDEX AGE = 25 YRS)      *
*       CLEAR T/A =  309 SURVIVING AT AGE 12     *
*   INFECTED T/A =   65 SURVIVING AT AGE 12      *
**************************************************
```

THREE PREDICTED PLANTATION CHARACTERISTICS ARE...
1) AVERAGE HEIGHT OF TEN TALLEST TREES = 36 FEET.
2) ARITHMETIC MEAN DBH = 4.98 INCHES.
3) QUADRATIC MEAN DBH = 5.13 INCHES.

PER ACRE VALUES

STRUCTURE			VOLUME & WEIGHT - TOTAL STEM				
			WOOD & BARK		WOOD ONLY		
DBH (IN)	NUMBER OF TREES	BASAL AREA (SQFT)	AVG IND. TREE HT (FT)	VOLUME (CUFT)	GREEN WEIGHT (LBS)	VOLUME (CUFT)	DRY WEIGHT (LBS)	DBH (IN)
1	0	0	0	0	0	0	0	1
2	4	0	16	1	24	0	14	2
3	39	2	20	19	490	12	385	3
4	92	8	23	91	1937	60	1876	4
5	115	16	26	196	3676	134	4190	5
6	83	16	29	223	3774	156	4914	6
7	34	9	32	135	2099	97	3059	7
8	7	2	34	38	546	28	877	8
9	1	0	36	7	96	5	169	9
10	0	0	0	0	0	0	0	10
11	0	0	0	0	0	0	0	11
12	0	0	0	0	0	0	0	12
13	0	0	0	0	0	0	0	13
14	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	15
TOTAL	374	53		710	12642	492	15484	

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