ornl

ORNL/TM-10848

OAK RIDGE
NATIONAL
LABORATORY

MARTIN MARIETTA

Short Rotation Woody Crops Program Publications and Presentations

A. R. Ehrenshaft

OAK RIDGE NATIONAL LABORATORY
CENTRAL RESEARCH LIBRARY
CIRCULATION SECTION
4500N ROOM 175
LIBRARY LOAN COPY
DO NOT TRANSFER TO ANOTHER PERSON
If you wish someone else to see this report, send in name with report and the library will arrange a loan.

OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
NTIS price codes—Printed Copy: A06 Microfiche A01

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ORNL/TM-10848

Health and Safety Research Division

Short Rotation Woody Crops Program Publications and Presentations

A.R. Ehrenshaft

Date Published - February 1989

Prepared for
Office of Renewable Energy Technology
Biofuels and Municipal Waste Technology Division
EB 24 00 00 0

Prepared by the
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831-6285
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-84OR21400

MARTIN MARIETTA ENERGY SYSTEMS LIBRARIES

3 4456 0284431 3

CONTENTS

ABSTRACT v

INTRODUCTION 1

UNIVERSITY OF ALASKA 3

UNIVERSITY OF ARIZONA 3

UNIVERSITY OF ARKANSAS 3

BIOENERGY DEVELOPMENT CORPORATION/U.S. FOREST SERVICE, PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION 3

ENERGY DEVELOPMENT INTERNATIONAL 5

UNIVERSITY OF FLORIDA 6

UNIVERSITY OF GEORGIA 12

UNIVERSITY OF HOUSTON 14

UNIVERSITY OF ILLINOIS 15

IOWA STATE UNIVERSITY 16

UNIVERSITY OF KANSAS 17

MICHIGAN STATE UNIVERSITY 20

MICHIGAN TECHNOLOGICAL UNIVERSITY 22

UNIVERSITY OF MINNESOTA 23

MISSISSIPPI STATE UNIVERSITY 24

NORTH CAROLINA STATE UNIVERSITY 24

NORTHERN STATE POWER COMPANY 33

OAK RIDGE NATIONAL LABORATORY 33

PENNSYLVANIA STATE UNIVERSITY 38

SEATTLE CITY LIGHT 42

SOUTHERN ILLINOIS UNIVERSITY 42

TENNESEE VALLEY AUTHORITY 42

TEXAS A&I UNIVERSITY 43

U.S. FOREST SERVICE, NORTH CENTRAL FOREST EXPERIMENT STATION 46

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION 59

UTAH STATE UNIVERSITY 62

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY 62

UNIVERSITY OF WASHINGTON/WASHINGTON STATE UNIVERSITY 63

APPENDIX A. SHORT ROTATION WOODY CROPS PROGRAM INVESTIGATORS 67

APPENDIX B. KEYWORD INDEX 73

ABSTRACT

The Department of Energy's (DOE) Short Rotation Woody Crops Program (SRWCP) was initiated in 1978, with technical management and subcontract administration transferred to the Biomass Production Program of Oak Ridge National Laboratory (ORNL) in 1981. This bibliography was compiled to document the information dissemination activities of the researchers funded by the SRWCP. The following materials have been included: book chapters, papers published in conference proceedings, unpublished conference papers, unpublished seminars and talks, technical journal and mass media articles, proceedings and symposium abstracts, Forest Service technical reports, dissertations and theses, and unpublished draft reports (which may include final project reports to DOE). The publications and presentations are arranged into separate sections for each research institution and each section is arranged alphabetically by author. All the material attributable to one author, or group of authors is further sorted in descending chronological order. All the references are numbered sequentially.

INTRODUCTION

The Department of Energy's (DOE) Short Rotation Woody Crops Program (SRWCP) was initiated in 1978, with technical management and subcontract administration transferred to the Biomass Production Program of Oak Ridge National Laboratory (ORNL) in 1981. The goal of the SRWCP is to develop the technology for producing an economically viable source of woody biomass which can be converted to liquid and gaseous fuels. Research objectives are to achieve mean biomass production levels of 20 $Mg \cdot ha^{-1} \cdot year^{-1}$ in 4- to 10-year-old plantations and to develop cost-effective procedures for establishing, maintaining, and harvesting plantations. The research conducted under the auspices of the program includes the investigation of species and genotype differences as well as the effect of cultural and climatic variables on growth and productivity. Although some softwoods were established in early species trials, most emphasis has been placed on hardwood species.

This bibliography was compiled to document the information dissemination activities of the researchers funded by the SRWCP. Because much of the work supported by the program is done in collaboration with researchers at different institutions, a reference may appear in more than one section. In addition, some of the citations listed herein did not directly result from SRWCP funding but were relevant to the program's mission. This document was assembled from information contained in the quarterly and annual reports submitted to ORNL by SRWCP subcontractors. Therefore, the comprehensiveness of this report is totally dependent on the completeness of the information supplied to the technical management team.

The following materials have been included: book chapters, papers published in conference proceedings, unpublished conference papers, unpublished seminars and talks, technical journal and mass media articles, proceedings and symposium abstracts, Forest Service technical reports, dissertations and theses, and unpublished draft reports (which may include final project reports to DOE). Much of the material is not publicly available (e.g., unpublished papers), but the author(s) are able to furnish additional information about the subject matter or a copy of the material. The addresses and telephone numbers of past and present SRWCP principal investigators can be found in Appendix A.

The publications and presentations are arranged into separate sections for each research institution, and each section is arranged alphabetically by author. All the material attributable to one author, or group of authors, is further sorted in descending chronological order. All the references are numbered sequentially. Appendix B contains a keyword index compiled from principal words in the publication titles (except such pervasive words as biomass, wood, energy). The index can be used to locate citations pertaining to a subject of interest. Each keyword is followed by a citation number(s). Using the citation number, the complete reference can be found.

The Biomass Production Program maintains a Biomass Reference System bibliographic database on an IBM PC using the KnowledgeMan[1] database management system. The citations which appear in this report comprise approximately 85% of those currently in the database. The remaining 15% represent background material concerning biological, economic, and environmental issues associated with producing woody biomass as an energy feedstock.

Comments concerning the content, organization, and style may be sent to:

Anne Ehrenshaft
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, Tennessee 37831-6352

[1] KnowledgeMan is a registered trademark of Micro Data Base Systems, Inc.

UNIVERSITY OF ALASKA

1
Bryant, J.P., F.S. Chapin III, and D.R. Klein. 1983. Carbon/nutrient balance of boreal plants in relation to vertebrate herbivory. Oikos 40(3):357-368.

2
Bryant, J.P., G. Wieland, P.B. Reichardt, V.E. Lewis, and M.C. McCathy. 1983. Pinosylvin methyl ether deters snowshoe hare feeding on green alder. Science 222:1023-1025.

3
Reichardt, P. 1981. Papyriferic acid: A triterpenoid from Alaska paper birch. J. Org. Chem. 46:4576-4578.

4
Yarie, J., and C.W. Slaughter. 1983. Establishment of intensive, short-rotation hardwood silviculture trials in central Alaska. Poster presented at the 34th Alaska Science Conference, September 28 October 1, 1983, Yukon Government, Energy Branch, Whitehorse, Yukon, Alaska.

5
Yarie, J., and K. Van Cleve. 1983. Potential effects of short rotation forestry in high latitudes on soils and site fertility. Paper presented at Towards Energy Self-Sufficiency in the North: Energy Conservation and Forest Biomass, Symposium held in association with the 34th Alaska Science Conference, September 28 October 1, 1983, Yukon Government, Energy Branch, Whitehorse, Yukon, Alaska.

UNIVERSITY OF ARIZONA

6
Reddy, S.J. 1982. Potential fuelwood species for the semiarid southwest. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. University of Arizona, Tucson. 64 pp.

UNIVERSITY OF ARKANSAS

7
Ku, T.T., J.B. Baker, C.R Blinn, and R.A. Williams. 1981. Understory biomass for energy fuel. pp. 230-233. IN J.P. Barnett (ed.) First Biennial Southern Silvicultural Research Conference. SO-34. U.S. Forest Service, Southeast Experiment Station.

8
Ku, T.T., J.B. Baker, C.R. Blinn, and R.A. Williams. 1980. Understory biomass from southern pine forest. An energy source? pp. 203. IN Agronomy Abstracts. American Society of Agronomy, Madison, Wisconsin.

BIOENERGY DEVELOPMENT CORPORATION/U.S. FOREST SERVICE, PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION

9
Crabb, T.B. 1985. Biomass energy project. *Eucalyptus plantations for energy production in* Hawaii, seven years later, the Bioenergy Development Corporation story. Paper presented at Hawaii Sugar Technologists Annual Conference, October 15, 1985.

10
Crabb, T.B. 1985. *Eucalyptus* plantations for energy production in Hawaii: Six and one half years later, the BioEnergy Development Corporation Story. Paper presented at 1985 Renewable Energy Technologies Symposium and Exposition, June 3-6, 1985, Anaheim, California.

11
Crabb, T.B. 1982. Biomass energy project: *Eucalyptus* plantations in Hawaii, three and a half years later, the Bioenergy experience. Paper presented at the Governors conference: Hawaii Energy Options for the '80's, August 17, 1982.

12
Crabb, T.B. 1982. Biomass energy project: *Eucalyptus plantations for energy production in* Hawaii, four years later, the Bioenergy experience. Paper presented at 1982 Agri-Energy Roundtable, Maui, Hawaii.

13
Crabb, T.B. 1982. *Eucalyptus* plantations for energy production in Hawaii. pp. 167-172. IN Proc., Governor's Energy Conference: Hawaii's energy options for the 80s. Honolulu, Hawaii.

14
Crabb, T.B. 1981. *Eucalyptus* plantations for energy production in Hawaii. pp. 67-70. IN Proc., Hawaii Forestry Wildlife Conference: Moving forestry and wildlife into the 80's. U.S. Forest Service.

15
DeBell, D.S., and C.D. Whitesell. 1987. Diameter-density relationships and spacing considerations for young *Eucalyptus saligna* plantations in Hawaii. Australian Forestry (in press).

16
DeBell, D.S., and C.D. Whitesell. 1987. Tentative spacing guidelines for *Eucalyptus saligna* in Hawaii based on diameter-density relationships. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 12 pp.

17
DeBell, D.S., C.D. Whitesell, and T.B. Crabb. 1987. Benefits of *Eucalyptus alibizia* mixtures vary by site on Hawaii island. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 5 pp.

18
DeBell, D.S., C.D. Whitesell, and T.B. Crabb. 1987. Benefits of *Eucalyptus alibizia* mixtures vary by site on Hawaii island. Australia Forestry (in press).

19
DeBell, D.S., C.D. Whitesell, and T.H. Schubert. 1987. Using N_2-fixing *Albizia* to increase growth of *Eucalyptus* plantations in Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program.

20
DeBell, D., and C.D. Whitsell. 1986. Admixing *Albizia* to supply nitrogen for *Eucalyptus* plantations in Hawaii (abstract). pp. 209. IN Proc., IEA/BA Task II Workshop: Production Technology, Economics and Nutrient Cycling. ENFOR Secretariat, Ottawa, Ontario, Canada.

21
DeBell, D.S., C.D. Whitesell, and T.H. Schubert. 1985. Mixed plantations of *Eucalyptus* and leguminous trees enhance biomass production. PSW-175. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. 6 pp.

22
Laarman, J.G., M.J. Vasievitch, and P.B. Durst. 1986. Techniques to harvest fast-growing energy plantations in Hawaii and the Phillipines. pp. 256-267. IN Proc., 18th IUFRO World Congress. International Union of Forest Research Organizations, Ljubljana, Yugoslavia.

23
Miyasaka, S.C. 1984. Comparison of quick- and slow-release fertilizers in young plantings of *Eucalyptus* species. Tree Plant. Notes 35(28):20-24.

24
Miyasaka, S.C., E.N Okazaki, and D.P. Bartholomew. 1983. The effect of lime and micronutrients on *Eucalyptus saligna* sm. seedling growth. HITAHR Research Series 025. University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources. 11 pp.

25
Miyasaka, S.C., A.W. Yeh, and C.D. Whitesell. 1983. Use of soil and tissue testing in forest crops. pp. 139-141. IN Proc., First Fertilizer and Ornamentals Workshop. Research Extension Series 037. University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources.

26
Schubert, T.H., and G.P. Markin. 1987. Control of ambrosia beetle in *Eucalyptus* stumps, 1984. Insecticide and Acaricide Tests 12:352-352.

27
Schubert, T.H., R.F. Schubert, T.G. Cole, and K.E. McDuffie. 1987. Equations for predicting biomass of six introduced subtropical tree species, island of Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 14 pp.

28
Schubert, T.H., S.A. Winsauer, and T.B. Crabb. 1987. *Eucalyptus* biomass harvesting on the island of Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 24 pp.

29
Schubert, T.H., A.W. Yeh, and S.C. Miyasaki. 1987. Weed control in *Eucalyptus* plantations in Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program.

30
Schubert, T.H. 1985. Preliminary results of eucalyptus/legume mixtures in Hawaii. Nitrogen Fixing Tree Research Reports 3:65-66.

31
Schubert, T.H., and C.D. Whitesell. 1985. Species trials for biomass plantations in Hawaii: A first appraisal. PSW-176. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. 13 pp.

32
Skolmen, R.G. 1986. Performance of Australian provenances of *Eucalyptus grandis* and *Eucalyptus saligna* in Hawaii. PSW-181. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. 8 pp.

33
Strand, R.F., C.D. Whitesell, and R.G. Skolmen. 1987. Comparison of provenance of four promising eucalypts for biomass production in Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 20 pp.

34
Whitesell, C.D. 1987. Performance of *Eucalyptus saligna* on a degraded site in Hawaii: Effects of spacing after 8 years. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 7 pp.

35
Whitesell, C.D., D.S. DeBell, and T.H. Schubert. 1987. Six-year growth of *Eucalyptus saligna* as affected by nitrogen and phosphorus fertilizer. PSW-188. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. 5 pp.

37
Whitesell, C.D., S.C. Miyasaka, and R.F. Strand. 1987. The effect of nitrogen and phosphorus on the early growth of *Eucalyptus saligna* sm. on three soils in Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 24 pp.

38
Whitesell, C.D., S.C. Miyasaka, R.F. Strand, T.H. Schubert, and K.E. McDuffie. 1987. Equations for predicting biomass in 2 to 6-year-old *Eucalyptus saligna* in Hawaii. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 12 pp.

39
Whitesell, C.D., and S.C. Miyasaka. 1981. Fertilization for biomass production. pp. 30-32. IN Proc., 14th Hawaii Fertilizer Conference. Research Extension Series 005. University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources.

40
Whitesell, C.D. 1980. *Eucalyptus* research for generating bioenergy: A 2 year progress report. pp. 71-73. IN Proc., Hawaii Forestry Wildlife Conference: Moving forestry and wildlife into the 80's. U.S. Forest Service.

41
Yost, R.S., D.S. DeBell, C.D. Whitesell, and S.C. Miyasaka. 1987. Early growth and nutrient status of *Eucalyptus saligna* as affected by nitrogen and phosphorus fertilization. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 25 pp.

ENERGY DEVELOPMENT INTERNATIONAL

42
Deardorff, D.C., and R.D. Kirmse. 1986. Expanded New Mexico woody biomass species trials and genetic improvement. Final technical report. NMRDI Project No. 2-73-4610. 116 pp.

43
Kirmse, R.D., and R.D. Fisher. 1987. Screening and biomass trials for potential fuelwood species in the semi-arid southwest United States. (in preparation).

44
Kirmse, R.D., and D.C. Deardorff. 1985. Short-rotation woody crops selection for bio-energy in Arizona, New Mexico, and Texas. Paper presented at Southwest Industrial Biomass Conference, Phoenix, Arizona.

45
Kirmse, R.D., and B.E. Norton. 1985. Comparison of the reference unit method and dimensional analysis methods for two large shrubby species in the Caatinga woodlands. J. Range Management 38(5):425-428.

UNIVERSITY OF FLORIDA

46
Arvanitis, L.G., and M. Newton. 1980. Estimation of acreage by ownership and land-use/soil-potential categories for selected tree species in Florida. An unpublished final report submitted to the U.S. Dept. of Energy's Short Rotation Woody Crops Program.

47
Bridgewater, F.E., J.T. Talbert, and D.L. Rockwood. 1982. Field design for genetic testing. pp. 28-39. IN Proc., Workshop on Progeny Testing. Southern Cooperative Series Bull. No. 275. University of Florida, Gainesville.

48
Buck, M.G. 1986. Concepts of resource sharing in agroforestry systems. Agroforestry Systems 4:191-203.

49
Campbell, M.S.F. 1983. Biomass yields of young, heavily stocked slash pine stands in north Florida. M.S. thesis. University of Florida, Gainesville. 56 pp.

50
Campbell, M.S.F., C.W. Comer, D.L. Rockwood, and C. Henry. 1983. Biomass productivity of slash pine in young, heavily-stocked stands. pp. 77-82. IN Proc., 1983 Southern Forestry Biomass Working Group Workshop.

51
Comer, C.W., L.F. Conde, D.L. Rockwood, and T.F. Geary. 1986. Casuarina cultural improvement in Florida. Nitrogen Fixing Tree Research Report 4:53-56.

52
Comer, C.W., and D.L. Rockwood. 1984. Screening of *Eucalyptus* species for coppice productivity. pp. 95-97. IN Proc., Sixth Southern Forest Biomass Workshop. University of Georgia, Athens.

53
Comer, C.W., D.L. Rockwood, and H. Riekerk. 1983. Frost tolerant *Eucalyptus* from North Florida. pp. 377-382. IN Proc., Frost Resistant *Eucalyptus* Symposium. International Union of Forestry Research Organizations.

54
Conde, L.F. 1980. Growth studies on *Melaleuca*. pp. 23-28. IN R.K. Geiger (ed.) Proc., *Melaleuca* Symposium. Florida Division of Forestry, Tallahassee.

55
Conde, L.F. 1979. Institute of Food and Agricultural Sciences Energy Information Handbook. University of Florida, Institute of Food and Agricultural Sciences, Gainesville.

56
Conde, L.F., and D.L. Rockwood. 1979. Energy plantation potential in Florida. pp. 2-11. IN Proc., Conference on Alternative Energy Sources for Florida. University of Florida, Gainesville.

57
Conde, L.F., and J.B. Huffman. 1978. Energy utilization from biomass, from fuel plantations. pp. 43-64. IN Proc., 10th Spring Symposium, Society of American Foresters Florida Section. Bethesda, Maryland.

58
Cropper Jr., W.P., and K.C. Ewel. 1987. A regional carbon storage simulation for large-scale biomass plantations. Ecological Modelling 36:171-180.

59
DeBarros, N.F. 1979. Effects of *Eucalyptus* on water yield and quality. IMPAC Report, Vol. 4, No. 23. University of Florida, School of Forest Resources and Conservation, Gainesville. 24 pp.

60
Dehgan, B., and S. Wang. 1983. Evaluation of hydrocarbon plants suitable for cultivation in Florida. Proc., Fla. Soil Crop Sci. Soc. 42:17-19.

61
Dehgan, B., and S. Wang. 1980. Hydrocarbons from plants. Nurserymen's Digest 14(4):56-67.

62
Dehgan, B., and S. Wang. 1979. Hydrocarbons from plant-latex. pp. 31-38. IN W.H. Smith (ed.) Proc., Alternative Energy Sources for Florida. University of Florida, Institute of Food and Agricultural Sciences, Gainesville.

63
Dippon, D.R., D.L. Rockwood, and C.W. Comer. 1986. Cost sensitivity analyses of *Eucalyptus* woody biomass systems. pp. 143-156. IN W.H. Smith (ed.) Biomass Energy Development. Plenum Press, New York.

64
Dippon, D.R. 1985. Cost sensitivity analysis of *Eucalyptus grandis*. Paper presented at the Third Southern Biomass Energy Research Conference, March 12-14,. 1985, Gainesville, Florida.

65
Dippon, D.R. 1985. Slash and sand pine intensive short-rotation culture: Economic energy feedstock? pp. 52-57. IN D.L. Rockwood (ed.) Proc., Seventh Southern Forest Biomass Workshop. University of Florida, Gainesville.

66
Fisher, R.F., and A.V. Mollitor. 1982. *Eucalyptus* responds dramatically to fertilization (abstract). Agron. Abstr.:264.

67
Flinchum, D.M., R.E. Goddard, H.R. Kok, P.A. Layton, C.H. McRae, G.L. Powell, and D.L. Rockwood. 1986. Cooperative Forest Genetics Research Program Twenty-seventh progress report. Report No. 36. University of Florida, School of Forest Research and Conservation, Gainesville. 20 pp.

68
Frampton Jr., L.J., and D.L. Rockwood. 1983. Genetic variation in biomass traits of sand and slash pines. Silvae Genet. 31(2-3):18-23.

69
Frampton Jr., L.J. 1981. Genetic variation of traits important for energy utilization in sand and slash pines. M.S. thesis. University of Florida, Gainesville. 135 pp.

70
Gilreath, J.P., W.D. Pitman, and D.L. Rockwood. 1983. Production of nonconventional crops for methane feedstocks. pp. 340-350. IN Proc., 1983 International Gas Research Conference.

71
Goddard, R.E., and D.L. Rockwood. 1983. Cooperative Forest Genetics Research Program Report: 25th progress report. Research Report No. 34. University of Florida, School of Forest Resources and Conservation, Gainesville. 18 pp.

72
Goddard, R.E., and D.L. Rockwood. 1983. Cooperative Forest Genetics Research Program 26th Progress Report. Research Report No. 35. University of Florida, School of Forest Resources and Conservation, Gainesville. 26 pp.

73
Goddard, R.E., D.L. Rockwood, and H.R. Kok. 1982. Cooperative Forest Genetics Research Program 24th Progress Report. Research Report No. 32. University of Florida, School of Forest Resources and Conservation, Gainesville. 25 pp.

74
Goddard, R.E., and D.L. Rockwood. 1981. Cooperative Forest Genetics Research Program 23rd Progress Report. Research Report No. 31. University of Florida, School of Forest Resources and Conservation, Gainesville. 17 pp.

75
Goddard, R.E., and D.L. Rockwood. 1980. Cooperative Forest Genetics Research Program 22nd Progress Report. Research Report No. 30. University of Florida, School of Forest Resources and Conservation, Gainesville. 15 pp.

76
Goddard, R.E., and R.L. Rockwood. 1979. Cooperative Forest Genetics Research Program 21st Progress Report. Research Report No. 29. University of Florida, School of Forest Resources and Conservation, Gainesville. 23 pp.

77
Huffman, J.B. 1981. Wood and bark utilization research: A progress report. pp. 37-68. IN R.K. Gieger (ed.) Proc., *Melaleuca* Symposium. Florida Division of Forestry, Tallahassee.

78
Huffman, J.B., and S. Wang. 1980. Heat of combustion of *Melaleuca* biomass (abstract). For. Prod. Res. Soc. Abstr. 34:24.

79
Huffman, J.B. 1977. Florida's *Melaleuca*: A utilization status report and problem analysis. Research Report No. 26. University of Florida, School of Forest Resources and Conservation, Gainesville.

80
Kossuth, S.V., D.R. Roberts, J.B. Huffman, and S. Wang. 1984. Energy value of paraquat-treated and resin-soaked loblolly pine. Wood Fiber Sci. 16(3):398-402.

81
Kossuth, S.V., D.R Roberts, J.B Huffman, and S. Wang. 1982. Resin acid, turpentine and caloric content of paraquat-treated slash pine. Can. J. For. Res. 12(3):489-492.

82
Marco, M.A. 1987. Genetic variation among and within *Eucalyptus grandis* provenances in Argentina and Florida. M.S. Thesis. University of Florida, Gainesville. 84 pp.

83
McCluskey, D.N., and R.F. Fisher. 1983. The effect of inoculum source on nodulation in *Casuarina glauca*. Commonw. For. Rev. 62(2):117-124.

84
McCluskey, D.N., and R.F. Fisher. 1983. The effect of inoculum source on nodulation in *Casuarina glauca*. Nitrogen Fixing Tree Research Report 1:48-50.

85
McCluskey, D.N. 1982. The influence of inoculum source and fertilization on root nodule formation in *Casuarina glauca*. M.S. thesis. University of Florida, Gainesville. 60 pp.

86
Meskimen, G.F., D.L. Rockwood, and K.V. Reddy. 1987. Development of *Eucalyptus* clones for a summer rainfall environment with periodic severe frosts. New For. 3:197-205.

87
Reddy, K.V., and D.L. Rockwood. 1987. Breeding strategies for coppice production in *Eucalyptus grandis* base population with four generations of selection. Silvae Genetica (in press).

88
Reddy, K.V., and D.L. Rockwood. 1986. Genetic factors influencing coppice success of eucalypts in Florida. pp. 303-309. IN Proc., Ninth North American Forest Biology Workshop. Oklahoma State University, Stillwater.

89
Reddy, K.V., D.L. Rockwood, C.W. Comer, and G.F. Meskimen. 1986. Genetic improvement of *Eucalyptus grandis* for biomass production in Florida. pp. 103-110. IN Proc., Third Southern Biomass Energy Research Conference. University of Florida, Gainesville.

90
Reddy, K.V., D.L. Rockwood, and G.F. Meskimen. 1986. A strategy for conversion of an *Eucalyptus grandis* base population into a seedling orchard. pp. 613-621. IN Proc., Breeding Theory, Progeny Testing, and Seed Orchards. International Union of Forestry Research Organizations.

91
Reddy, K.V. 1985. Effect of inbreeding on estimates of genetic parameters in *Eucalyptus grandis*. IN R.C. Schmidtling and M.M. Griggs (eds.) Proc., Eighteenth Southern Forest Tree Improvement Conference. U.S. Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi.

92
Reddy, K.V. 1985. Genetic improvement of *Eucalyptus grandis* (Hill) Maiden for coppice productivity. Ph.D. dissertation. University of Florida. 124 pp.

93
Reddy, K.V., D.L. Rockwood, C.W. Comer, and G.F. Meskimen. 1985. Predicted genetic gains adjusted for inbreeding for a *Eucalyptus grandis* seed orchard. pp. 283-289. IN R.C. Schmidtling and M.M. Griggs (eds.) Proc., Eighteenth Southern Forest Tree Improvement Conference. U.S. Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi.

94
Reighard, G.L. 1985. Genetic and cultural factors affecting growth performance of slash pine. pp. 100-106. IN R.C. Schmidtling and M.M. Griggs (eds.) Proc., Eighteenth Southern Forest Tree Improvement Conference. U.S. Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi.

95
Reighard, G.L., and D.L. Rockwood. 1985. Plot subsampling in intensively cultured slash and sand pine tests. pp. 27-30. IN D.L. Rockwood (ed.) Proc., Seventh Southern Forest Biomass Workshop. University of Florida, Gainesville.

96
Riekerk, H. 1982. Environmental impacts of intensive silviculture in Florida. IN S.P. Gessel and R. Ballard (eds.) Symposium on Forest Site and Continous Productivity. U.S. Forest Service, Pacific Northwest Experiment Station, Seattle, Washington.

97
Riekerk, H., and W.S. Gain. 1982. Environmental effects of whole-tree silviculture. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. University of Florida, Gainesville. 67 pp.

98
Riekerk, H., J.C. Hendrickson, and W.S. Gain. 1981. Site and environmental effects of tree biomass silviculture. pp. 1581-1591. IN Proc., 1981 International Gas Research Conference. University of Florida, Gainesville.

99
Riekerk, H., L.F. Conde, J.C. Hendrickson, and W.S. Gain. 1980. Research on environmental and site effects of forest management practices in the lower coastal plain. pp. 331-339. IN J.P. Barnett (ed.) First Biennial Southern Silvicultural Research Conference. SO-34. U.S. Forest Service, Southeast Experiment Station.

100
Rockwood, D.L., D.R. Dippon, and M.S. Lesney. 1988. Woody species for biomass production in Florida. Final Report. 1983-1988. ORNL/Sub/81-09050/7. University of Florida, Gainesville. 153 pp.

101
Rockwood, D.L., and G.M. Prine. 1988. Alternative production systems: woody crops. pp. 277-289. IN W.H. Smith and J.R. Frank (eds.) Methane: a systematic approach. Elsevier Applied Science.

102
Rockwood, D.L., and D.R. Dippon. 1987. Prospects for commercialization of *Eucalyptus* biomass plantations in Florida. pp. 233-249. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes X. Institute of Gas Technology, Chicago.

103
Rockwood, D.L., K.V. Reddy, E.I. Warrage, and C.W. Comer. 1987. Development of *Eucalyptus amplifolia* for woody biomass production. Aust. For. Res. 17:173-178.

104
Rockwood, D.L. 1986. Development of woody biomass cultural systems for Florida. pp. 85-94. IN W.H. Smith (ed.) Biomass Energy Development. Plenum Press, New York.

105
Rockwood, D.L., and J.D. DeValerio. 1986. Promising species for woody biomass production in warm-humid environments. Biomass 11:1-17.

106
Rockwood, D.L., R.F. Fisher, L.F. Conde, and J.B. Huffman. 1986. Australian pines (*Casuarina* spp.). IN Silvics of Forest Trees of the United States (in press).

107
Rockwood, D.L., and K.V. Reddy. 1986. Factors necessary for energy cropping of sand pine. Paper presented at 4th Southern Biomass Energy Research Conference.

108
Rockwood, D.L. 1985. *Casuarina equisetifolia*. NFT Highlights. Nitrogen Fixing Tree Association. 2 pp.

109
Rockwood, D.L., C.W. Comer, D.R. Dippon, and J.B. Huffman. 1985. Woody biomass production options for Florida. Technical Bulletin 856. University of Florida, Agricultural Experiment Station, Gainesville.

110
Rockwood, D.L., R.C. Kellison, E.C. Franklin, and G.F. Meskimen. 1985. Operational advanced generation improvement programs for minor species in the South. pp. 27-37. IN Advanced Generation Breeding of Forest Trees. Southern Cooperative Series Bulletin No. 309. Louisiana State University Agricultural Center.

111
Rockwood, D.L. 1984. Genetic improvement potential for biomass quality and quantity. Biomass 6(1&2):37-45.

112
Rockwood, D.L., D.R. Dippon, and C.W. Comer. 1984. Potential of *Eucalyptus grandis* for biomass production in Florida. Bio-Energy 84:86-93.

113
Rockwood, D.L., K.V. Reddy, C.W Comer, O.J. Webley, G.F. Meskimen, and T.F. Geary. 1984. Variation in coppicing of eucalypts in southern Florida (abstract). pp. 147. IN Proc., North American Forest Biology Workshop. Logan, Utah.

114
Rockwood, D.L. 1983. Alternative designs for progeny testing slash pine. pp. 179-185. IN Proc., 17th Southern Forest Tree Improvement Conference. University of Georgia, Athens.

115
Rockwood, D.L. 1983. Biomass feedstocks: Improvement in quality and quantity through genetic selection and breeding (abstract). pp. 72-76. IN Summary of the Southern Biomass Energy Research Conference. University of Alabama, Tuscaloosa.

116
Rockwood, D.L., C.W. Comer, L.F. Conde, D.R. Dippon, J.B. Huffman, H. Riekerk, and S. Wang. 1983. Energy and chemicals from woody species in Florida. Final report for the period April 17,. 1978-May 16, 1983. ORNL/Sub/81-9050/1. University of Florida, Gainesville. 154 pp.

117
Rockwood, D.L., C.W. Comer, D.R. Dippon, J.B. Huffman, H. Riekerk, and S. Wang. 1983. Current status of woody biomass production research in Florida. Proc., Soil Crop Sci. Soc. 42:19-27.

118
Rockwood, D.L., and L.F. Conde. 1983. Genetic variation for biomass production in *Eucalyptus grandis*. International Union of Forestry Research Organizations Fast Growing Trees Symposium. Silvicultura 8(30):652-653.

119
Rockwood, D.L., L.F. Conde, and J.B. Huffman. 1983. Utilization of *Melaleuca quinquenervia* for biomass production. International Union of Forestry Research Organizations Fast Growing Trees Symposium. Silvicultura 8(30):375-376.

120
Rockwood, D.L., J.B Huffman, and L.F. Conde. 1983. Potential of *Casuarina* spp. for biomass production in Florida. International Union of Forestry Research Organizations Fast Growing Trees Symp. Silvicultura 8(30):376-377.

121
Rockwood, D.L., C.F Windsor, and J.F. Hodges. 1983. Response of slash pine progenies to fertilization. South. J. Appl. For. 8:37-40.

122
Rockwood, D.L., and T.F. Geary. 1982. Genetic variation in biomass productivity and coppicing of intensively grown *Eucalyptus grandis* in southern Florida. pp. 400-403. IN Proc., 7th North American Forest Biology Workshop. University of Kentucky, Lexington.

123
Rockwood, D.L., T.F. Geary, and P.S. Bourgeron. 1982. Planting density and genetic influences on seedling growth and coppicing of Eucalypts in southern Florida. pp. 95-102. IN Proc., 1982 Southern Forest Biomass Workshop. U.S. Forest Service, Southern Forest Experiment Station, New Orleans, Louisiana.

124
Rockwood, D.L., L.F. Conde, and R.F. Fisher. 1981. Maximizing woody biomass production in Florida. pp. 859-867. IN Proc., 1981 International Gas Research Conference. University of Florida, Gainesville.

125
Rockwood, D.L., R.F Fisher, and L.F. Conde. 1981. Production potential of *Eucalyptus grandis* grown in short-rotation, close-spacing systems (abstract). pp. 121. IN Proc., 13th International Botanical Congress. Sydney, Australia.

126
Rockwood, D.L., and G.F. Meskimen. 1981. Genetic, spacing, and genotype x spacing influences on growth of *Eucalyptus grandis* in south Florida. pp. 47-54. IN Proc., 16th Southern Forest Tree Improvement Conference.

127
Rockwood, D.L., L.F. Conde, and R.H. Brendemuehl. 1980. Biomass production of closely spaced Choctawhatchee sand pines. SE-293. U.S. Forest Service, Southeast Experiment Station. 6 pp.

128
Rockwood, D.L., R.E Goddard, A.E Squillace, and J.B. Huffman. 1980. Genetic manipulation of slash pine for maximum energy production in silvicultural biomass plantations (abstract). pp. 291. IN Proc., 6th North American Forest Biological Workshop.

129
Rockwood, D.L., and L.J. Frampton. 1979. Genetic variation in sand pine and slash pine for energy production in silvicultural biomass plantations. pp. 156-165. IN Proc., 15th Southern Forest Tree Improvement Conference. Mississippi State University, Mississippi State.

130
Roeder, K.R., and D.L. Rockwood. 1983. Potential stem biomass and energy content yields of *Eucalyptus grandis* and *Eucalyptus robusta* in south Florida. Technical Bulletin 831. University of Florida, Agricultural Experiment Station, Gainesville. 6 pp.

131
Roeder, K.R. 1981. Variation in energy-related traits of *Eucalyptus* in south Florida. M.S. thesis. University of Florida, Gainesville. 73 pp.

132
Smith, W.H. 1983. Biomass production in Florida. Proc., Soil and Crop Science Society of Florida Symposium 42:1.

133
Smith, W.H., and M.L. Dowd. 1981. Biomass production in Florida. J. For. 79:508-511, 515.

134
Wang, F.C., J.R. Richardson, K. C. Ewel, and E.T. Sullivan. 1981. Preliminary energy analysis of utilizing wood biomass for fuel. pp. 673-680. IN Proc., 1981 International Symposium on Energy and Ecol. Modeling.

135
Wang, S. 1983. Screening biomass species for methane production in Florida. For. Prod. 33(10):66-68.

136
Wang, S., R.C. Littell, and D.L. Rockwood. 1984. Variation in density and moisture content of wood and bark among 20 *Eucalyptus grandis* progenies. Wood Sci. Technol. 18:97-100.

137
Wang, S., and S.T. Chiang. 1983. Chemical properties of *Melaleuca* bark from south Florida. Econ. Bot. 37(2):16-21.

138
Wang, S., and R.C. Littell. 1983. Phenotypic variation in calorific value of *Melaleuca* materials from south Florida. Econ. Bot. 37(3):292-298.

139
Wang, S., and J.B. Huffman. 1982. Effect of extractives on heat content of woody fuels. Wood Sci. 15(1):33-38.

140
Wang, S., J.B. Huffman, and D.L. Rockwood. 1982. Qualitative evaluation of fuelwood in Florida: A summary report. Econ. Bot. 36(4):381-388.

141
Wang, S., and J.B. Huffman. 1981. Botanochemicals: Supplements to petrochemicals. Econ. Bot. 35(4):369-382.

142
Wang, S., J.B. Huffman, and R.C. Littell. 1981. Characterization of *Melaleuca* biomass as a fuel for direct combustion. Wood Sci. 13(4):216-219.

143
Wang, S., and J.B. Huffman. 1979. Effect of extractives on heat value of *melaleuca* (abstract). For. Prod. Res. Soc. Abstr. 33:6.

144
Warrag, E.I., V. Ortega, M.S. Lesney, and D.L. Rockwood. 1987. Recent progress in tissue culture methods for *Eucalyptus* species and implications for genetic improvement. Paper presented at 9th Southern Forestry Biomass Workshop.

145
Webley, O.J, T.F. Geary, D.L. Rockwood, C.W. Comer, and G.F. Meskimen. 1986. Seasonal coppicing variation in three eucalypts in Southern Florida. Aust. For. Res. 16:281-90.

UNIVERSITY OF GEORGIA

146
Baker, T.R. 1983. Nursery bed density and nitrogen fertilization effects on *Liquidambar styraciflua L.* and *Platanus occidentalis* L. seedling development. M.S. thesis. University of Georgia, Athens.

147
Birchem, R., H.E. Sommer, and C.L. Brown. 1981. Comparison of plastids and pigments of *Pinus palustris* Mill. and *Pinus elliottii* Engelm. in callus tissue culture. Z. Pflanzenphysiol. 102:101-107.

148
Birchem, R., H.E. Sommer, and C.L. Brown. 1981. Scanning electron microscopy of shoot and root development in sweetgum callus tissue culture. For. Sci. 27:206-212.

149
Brown, C.L., and H.E. Sommer. 1982. Vegetative propagation of dicotyledonous trees. pp. 109-149. IN J.M. Bonga and D.J. Durzan (eds.) Tissue culture in forestry. Martinus-Niejhoff, The Hague.

150
Brown, C.L. 1977. Application of tissue culture technology to Southern forestry. Paper presented at American Pupwood Association, Southeastern Technical Division Meeting, November 1977, Jacksonville, Florida.

151
Brown, C.L. 1977. Potentialities of biomass as sources of energy. pp. 18-25. IN Proc., The Energy Crisis: Overview and Analysis.

152
Dickmann, D.I., K. Steinbeck, and T. Skinner. 1985. Leaf area and biomass in mixed and pure plantations of sycamore and black locust in the Georgia Piedmont. For. Sci. 31:509-517.

153
Huber, D.A., and B.C. Bongarten. 1981. Specific gravity as a selection criterion in sycamore. Paper presented at 16th Southern Forest Tree Improvement Conference, May 26-29, 1981, Blacksburg, Virginia.

154
Kennedy, J.M. 1983. Geographic variation in black locust (*Robinia pseudoacacia*). M.S. thesis. University of Georgia, Athens.

155
Lee, N., H.Y. Wetzstein, and H.E. Sommer. 1987. Effects of quantum flux density on photosynthesis and chloroplast ultrastructure in tissue-cultured plantlets and seedlings of *Liquidambar styraciflua* L. towards improved accumatization and field. survival Plant Physiology (in press).

156
Neenan, M., and K. Steinbeck. 1979. Caloric values for young sprouts of nine hardwood species. For. Sci. 25:455-461.

157
Pokorny, F.A., and H.Y. Wetzstein. 1984. Internal porosity, water availability, and root penetration of pine bark particles. J. Hortic. Science. 19:447-449.

158
Sommer, H.E., H.Y. Wetzstein, and N.I. Lee. 1985. Advances in the tissue culture of *Liquidambar styraciflua* L. IN Proc., Eighteenth Southern Forest Tree Improvement Conference. U.S. Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi.

159
Sommer, H.E., and H.Y. Wetzstein. 1984. Hardwoods. pp. 511-540. IN D.A. Evans, W.R. Sharp, P.V. Ammirato, and Y. Yomado (eds.) Handbook of plant cell culture. Volume 3. MacMillan Co., New York.

160
Sommer, H.E., and H.Y. Wetzstein. 1984. Research into the tissue culture propagation of sweetgum. pp. 155. IN Proc., 8th North American Forest Biology Workshop. Logan, Utah.

161
Sommer, H.E., and H.Y. Wetzstein. 1983. State of the art of vegetative propagation of non-coniferous woody plants (tissue culture). Working paper prepared for IEA Planning Group B, University of Georgia, Athens.

162
Sommer, H.E., H.Y. Wetzstein, and N. Lee. 1983. *In vitro* propagation of *Liquidambar styraciflua* L. Poster presented at the 17th Southern Forest Tree Improvement Conference Meeting, Athens, Georgia.

163
Sommer, H.E. 1982. Literature guide for plant tissue culture. pp. 599-601. IN A. Mitsui and C.C. Black (eds.) CRC Handbook of biosolar resources. CRC Press, Inc., Boca Raton, Florida.

164
Sommer, H.E. 1982. Sources and collections of woody forest plants. pp. 597-598. IN A. Mitsui and C.C. Black (eds.) CRC Handbook of biosolar resources. CRC Press, Inc., Boca Raton, Florida.

165
Sommer, H.E., and H.Y. Wetzstein. 1982. Application of tissue culture to forest tree improvement. Paper presented at the 8th Long Ashton Symposium, September 12-15, 1982, Bristol, England.

166
Sommer, H.E., and H.Y. Wetzstein. 1982. Tissue culture propagation of sweetgum, prospects and problems. Paper presented at the 7th North American Forest Biology Workshop, Lexington, Kentucky.

167
Sommer, H.E. 1981. Propagation of sweetgum by tissue culture. pp. 184-189. IN Proc., 16th Southern Forest Tree Improvement Conference.

168
Sommer, H.E., and L.S. Caldas. 1981. *In vitro* methods applied to forest trees. pp. 349-358. IN T.A. Thorpe (ed.) Plant tissue culture. Academic Press, New York.

169
Sommer, H.E., and C.L. Brown. 1980. Embryogenesis in tissue culture of sweetgum. For. Sci. 26:257-260.

170
Sommer, H.E., and C.L. Brown. 1979. Application of tissue culture to forest tree improvement. pp. 461-491. IN W.R. Sharpe, P.O. Larsen, E.F. Paddock, and V. Raghavan (eds.) Plant cell and tissue culture principles and applications. Ohio State University Press, Columbus.

171
Sommer, H.E., C.L. Brown, and P.P. Kormanik. 1975. Differentiation of plantlets in longleaf pine (*Pinus palustris* mill.) tissue cultured *in vitro*. Bot. Gaz 136(2):196-200.

172
Steinbeck, K., and T.M. Skinner. 1987. Changes in soil nutrient levels under young short-rotation forests in the Georgia Piedmont. Soil Science (in press).

173
Steinbeck, K. 1983. Potentialities of short-rotation forestry for developing countries. Outlook Agric. 12(4):160-164.

174
Steinbeck, K. 1981. Energy output/input ratios for short-rotation growth of American sycamore. pp. 71-77. IN D.L. Klass and G.H. Emert (eds.) Fuels from Biomass and Wastes, Vol.3. Ann Arbor Science, Ann Arbor, Michigan.

175
Steinbeck, K. 1981. Short-rotation forestry as a biomass source: An overview. pp. 163-171. IN Proc., Energy from Biomass, 1st European Communities Conference. Applied Science Publishers Ltd., London.

176
Steinbeck, K. 1981. Short-rotation forests: An energy alternative. Paper presented at Royal Dublin Society, First International Summer School in Agriculture, July 13-26, 1981, Dublin.

177
Steinbeck, K. 1980. Biomass energy sources for Alabama. Ala. Acad. Sci. 51:86-91.

178
Steinbeck, K. 1980. Short-rotation forests for energy production. Paper presented at American Chemical Society Annual Meeting, August. 1980, San Francisco, California.

179
Steinbeck, K., and C.L. Brown. 1980. Short-rotation coppice forestry research in Georgia: A status report. Paper presented at the Bio-Energy '80 Congress, April. 1980, Atlanta, Georgia.

180
Steinbeck, K., and L.C. Nwoboshi. 1980. Rootstock mass of coppiced *Platanus occidentalis* as affected by spacing and rotation length. For. Sci. 26:545-547.

181
Steinbeck, K. 1979. Increasing the biomass production of short rotation coppice forests. Paper presented at 3rd Annual Biomass Energy Systems Conference, June 5-7, 1979, Golden, Colorado.

182
Steinbeck, K. 1977. Energy potential of intensively managed short rotation hardwoods. Paper presented at Forest Products Research Society meeting, October, 1977, Tuscaloosa, Alabama.

183
Steinbeck, K., and J.T. May. 1976. Artificial hardwood regeneration in the Southeast: Some aspects of planting stock quality. pp. 1-7. IN Proc., Fourth North American Forest Biology Workshop. State University of New York, College of Environmental Science and Forestry, Syracuse.

184
Stine, M., and H.E. Sommer. 1983. Adventitious shoots on embryos of *Pinus palustris*, *P. elliotti*, and *P. palustris* X *elliotti*. Poster presented at the 17th Southern Forest Tree Improvement Conference Meeting, Athens, Georgia.

185
Wetzstein, H.Y., and J.J. Frett. 1984. Light and scanning electron microscopy of intumescences on tissue-cultured sweet potato leaves. J. Am. Soc. Hort. Sci. 109:280-283.

186
Wetzstein, H.Y., N. Lee, and H.E. Sommer. 1984. Differentiation of tissue cultured *Liquidambar styraciflua* in agar versus liquid medium. J. Hortic. Science. 19:556.

187
Wetzstein, H.Y., and D. Sparks. 1984. The morphology of staminate flower differentiation in pecan. J. Am. Soc. Hortic. Sci. 109:245-252.

188
Wetzstein, H.Y., and H.E. Sommer. 1983. Root anatomy in tissue cultured *Liquidambar styraciflua* L. J. Hortic. Science 18:172.

189
Wetzstein, H.Y., and H.E. Sommer. 1983. Scanning electron microscopy of *in vitro* cultured *Liquidambar styraciflua* plantlets during acclimatization. J. Am. Soc. Hortic. Sci. 108:475-480.

190
Wetzstein, H.Y., and H.E. Sommer. 1983. State of the art of vegetative propagation of non-coniferous woody plants (conventional methods). Working paper prepared for IEA Planning Group B, University of Georgia, Athens.

191
Wetzstein, H.Y., and H.E. Sommer. 1982. Structural aspects in acclimatization of *in vitro* cultured *Liquidambar styraciflua*. Poster presented at 8th Long Ashton Symposium, September 12-15, Bristol, England.

192
Wetzstein, H.Y., H.E. Sommer, C.L. Brown, and H.M. Vines. 1981. Anatomical changes in tissue-cultured sweetgum leaves during the hardening-off period (abstract). J. Hortic. Science 16:290.

UNIVERSITY OF HOUSTON

193
Cowles, J.R., and H.W. Scheld. 1987. Cultural and management practices for the Chinese tallow tree as a biomass fuel source. Final report:. 1978-1984. ORNL/Sub/81-09059/1. University of Houston, Houston. 49 pp.

194
Glumac, E.L., and J.R. Cowles. 1986. The Chinese tallow tree (*Sapium sebiferun*) as a woody biomass crop for marginal soils of the Gulf Coastal plain. Paper presented at the Fourth Southern Biomass Energy Research Conference, October 7-9, 1986, Athens, Georgia.

195
Scheld, H.W., J.R. Cowles, C.R. Engler, R.L. Kleiman, S.L. Mathieu, and E.B. Shultz Jr. 1984. Seeds of the Chinese tallow tree, *Sapium sebiferum* (L.) Roxb., as a source of chemicals and fuel. IN R.P. Morgan and E.B. Shultz Jr. (eds.) Fuels and chemicals from oilseeds: Technology and policy options. Westview Press, Washington, DC.

196
Scheld, H.W., G.N. Cameron, J.R. Cowles, C.R. Engler, A.D. Krikorian, L.J. Lester, and E.B. Shultz Jr. 1983. Progress in domestication of the Chinese tallow tree, *Sapium sebiferum*. Paper presented at Seminar III, Vegetable Oil as Diesel Fuel, October. 19-20, 1983, U.S. Department of Agriculture, Northern Agricultural Energy Center, Peoria, Illinois.

197
Scheld, H.W., J.R. Cowles, R.L. Kleiman, C.R. Engler, and E.B. Shultz Jr. 1983. Development of the Chinese tallow tree as a source of chemicals and energy. Paper presented at American Section/International Energy Society, June 1-5, 1983, Houston, Texas.

198
Scheld, H.W., J.R. Cowles, R.L. Kleiman, C.R. Engler, and E.B. Shultz Jr. 1983. *Sapium sebiferum*. pp. 46-49. IN Firewood crops: Shrub and tree species for energy production. Volume 2. National Academy Press, Washington, DC.

199
Scheld, H.W., N.B. Bell, G.N. Cameron, J.R. Cowles, C.R. Engler, A.D. Krikorian, and E.B. Schultz Jr. 1981. The Chinese tallow tree as a cash and petroleum-substitute crop. pp. 97-111. IN Tree crops for energy co-production on farms. SERI/CP 622-1068. Solar Energy Research Institute, Golden, Colorado.

200
Scheld, H.W., and J.R. Cowles. 1981. Woody biomass potential of the Chinese tallow tree. Econ. Bot. 35:391-397.

UNIVERSITY OF ILLINOIS

201
Campbell, G.E., and K.A. Majerus. 1986. Biomass production for energy feedstocks on marginal land in the Great Lakes Region. Executive summary. University of Illinois at Urbana-Champaign, Department of Forestry. 65 pp.

202
Chow, P., G.L. Rolfe, and L.E. Arnold. 1983. Chemicals, fiber, and energy from woody biomass. Ill. Res. 25(1):11-13.

203
Chow, P., G.L. Rolfe, C.S. Lee, and T.A. White. 1983. The chemical properties of 2-year-old deciduous species. pp. 557-575. IN J. Applied Polymer Science, Symposia Series.

204
Chow, P., B. Motter, G.L. Role, and T.A. White. 1982. Effects of spacing and site on some physical and chemical properties of wood from short rotation forestry. Paper presented at Energy Research Symposium, April 27, 1982, University of Illinois, Illinois Experiment Station, College of Agriculture.

205
Chow, P., G.L. Rolfe, C.S. Lee, and T.A. White. 1982. Some physical properties of 2-year-old hardwood biomass grown in Illinois (abstract). Paper presented at 36th Annual Meeting of the Forest Products Research Society, Madison, Wisconsin.

206
Chow, P., and G.L. Rolfe. 1981. Utilization of woody biomass for energy. Paper presented at Energy Research Symposium, February 5, 1981, University of Illinois, Urbana.

207
Chow, P., G.L. Rolfe, T.A. White, and C.S. Lee. 1980. Energy values of juvenile sycamores. Ill. Res. 22(4):12-13.

208
Dawson, J.O., T.A. White, R.A. Herendeen, and P.J. Dzialowy. 1982. Accretion of nitrogen in soil of a young plantation of *Robinia pseudoacacia*. Ill. Agric. Exp. Stn. For. Res. Rep. 82(7):3.

209
Hooper, C., M.F. Bolin, J.J. Jokela, G.L. Rolfe, and T.A. White. 1985. Fuelwood Plantations. Circular 1236. University of Illinois, College of Agriculture, Cooperative Extension Service, Urbana. 15 pp.

210
Majerus, K.A., and G.L. Rolfe. 1987. Changes in soil elemental concentrations under short-rotation wood production systems. Forestry Research Report 87-1. University of Illinois, Agricultural Experiment Station. 11 pp.

211
Majerus, K.A., and G.L. Rolfe. 1987. Seedling and coppice yields from short-rotation wood production systems. Forestry Research Report 87-1. University of Illinois, Agricultural Experiment Station, Urbana. 10 pp.

212
Rolfe, G.L., and K.A. Majerus. 1984. Woody biomass production through solar energy conversion: Phase I. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. University of Illinois. 123 pp.

213
Rolfe, G.L., and T.A. White. 1979. Capturing the sun's energy in woody biomass. Ill. Res. 21:4-5.

214
White, T.A., and G.L. Rolfe. 1984. Comparative energy costs of stem cuttings, seedlings, and seeds as propagules in woody biomass plantations. Biomass 5(1):55-64.

215
White, T.A., and G.L. Rolfe. 1983. A test of tolerance: 1982 greenhouse herbicide trials with direct-seeded black locust. For. Res. Rep. No. 83-2. University of Illinois, Agricultural Experiment Station. 5 pp.

216
White, T.A., G.L. Rolfe, and L.E. Arnold. 1983. Home-grown firewood. Ill. Res. 25(1):9-10.

217
White, T.A., and G.L. Rolfe. 1982. Tolerance of direct-seeded black locust (*Robinia pseudoacacia* L.) to herbicides. Ill. Agric. Exp. Stn. For. Res. Rep. 82(10):5.

218
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1982. Effects of herbicides on tolerance of woody biomass species and control of weeds in southern Illinois: 1980 herbicide trials. Ill. Agric. Exp. Stn. For. Res. Rep 82(6):6.

219
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1982. Effects of some preemergent herbicides on survival and tolerance of various woody biomass species: 1979 herbicide trials. Ill. Agric. Exp. Stn. For. Res. Rep. 82(5):4.

220
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1981. Energy production from direct-seeded woody biomass. Ill. Agric. Exp. Stn. DSAC 9:249-252.

221
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1981. Establishment of woody biomass plantations in the midwest: 1980 herbicide trials. Ill. Agric. Exp. Stn. DSAC 9:236-246.

222
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1981. The energy balance of intensively cultured autumn olive for biomass production. Ill. Agric. Exp. Stn. DSAC 9:253-259.

223
White, T.A., G.L. Rolfe, and D.R. Bluhm. 1981. Yield of six woody biomass species during a two-year establishment rotation in southern Illinois. Ill. Agric. Exp. Stn. DSAC 9:246-248.

224
White, T.A., and G.L. Rolfe. 1980. Stand establishment and maintenance of woody biomass species: 1979 herbicide trials. Ill. Agric. Exp. Stn. DSAC 8:171-175.

225
White, T.A., G.L. Rolfe, J.J. Faix, and R.W. Zimmerman. 1979. Pilot studies of woody biomass for energy. Ill. Agric. Exp. Stn. DSAC 7:221-225.

IOWA STATE UNIVERSITY

226
Hall, R.B., and E.R. Hart. 1987. Screening *Alnus* for resistance to *Fenusa dohrnii* (Tischbein). Paper presented at Entomological Society National Meeting, December. 1987, Boston, Massachusetts.

227
Hall, R.B., and R.N. Nyong'o. 1987. Design, establishment, and management of a black alder (*Alnus glutinosa* L. gaertn.) seed orchard. pp. 261-268. IN Proc., 19th Southern Forest Tree Improvement Conference. National Technical Information Service, Springfield, Virginia.

228
Hall, R.B. 1986. Plant materials selection. Paper presented at Wood Energy: Production and Use, March 31, 1986, Society of American Forestors, Iowa Section.

229
Hall, R.B. 1985. Alder: An agricultural alternative. Paper presented at meeting of Iowa Academy of Science, April 27, 1985, Pella, Iowa.

230
Hall, R.B., G.A. Miller, T.L. Robison, and O.U. Onokpise. 1983. Developing *Alnus* for use in intensive culture. pp. 35-45. IN Intensive plantation culture: 12 years research. NC-91. U.S. Forest Service, North Central Forest Experiment Station.

231
Hart, E.R., and R.B. Hall. 1987. Phenology of *Fenusa dohrnii* (Tischbein) on black alder in central Iowa. Paper presented at the Entomological Society of America National Meeting, December 1987, Boston, Massachusetts.

232
Miller, G.A. 1983. Variation in growth, nitrogen fixation, and assimilate allocation among selected *Alnus glutinosa* (L.) Gaertn. clones. Ph.D. dissertation. Iowa State University, Ames. 117 pp.

233
Onokpise, O.U. 1984. Genotype x environment interaction in European black alder (*Alnus glutinosa* (L.) Gaertn.). Ph.D. dissertation. Iowa State University, Ames. 156 pp.

234
Robison, T.L. 1984. Age-age correlations, trait correlations, and wood property variation for an *Alnus glutinosa* (L.) Gaertn. provenance study. Ph.D. dissertation. Iowa State University, Ames. 117 pp.

235
Schultz, R.C., and R.B. Hall. 1985. Growth and rooting characteristics of hybrid aspen and alder on a reclaimed mine site. Paper presented at Iowa Academy of Science Meeting, April 27, 1985, Pella, Iowa.

236
Shin, M.Y. 1986. A progeny test to evaluate biomass production for intensive culture of European black alder (*Alnus glutinosa* (L.) Gaertn.). M.S. thesis. Iowa State University, Ames. 54 pp.

UNIVERSITY OF KANSAS

237
Argent, R.M., W.A. Geyer, and W.P. Walawender. 1985. Siberian elm: From windbreaks to wood energy (abstract). IN Proc., Kansas Academy of Science.

238
Argent, R.M. 1984. Outside storage effects on fuel potential of wood chip piles (abstract). Trans. Kan. Acad. Sci. 3

239
Cable, T.T., T.D. Warner, and W.A. Geyer. 1987. Residential fuelwood use in Kansas. pp. 145-150. IN Proc., International Conference on Residential Wood Energy.

240
Cable, T.T., T.D. Warner, and W.A. Geyer. 1986. Fuelwood consumption in Kansas. National Woodlands (Jul-Aug):15-17.

241
Castonguay, T.L., and M.H. Hansen. 1984. Wooded strips and windbreaks in Kansas. NC-313. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.

242
Chandler, P., and W.A. Geyer. 1979. Economic and energy-cost analyses for a theoretical energy forest plantation (abstract). Trans. Kans. Acad. Sci. 82(2):85.

243
Geyer, W.A. 1987. Coppice characteristics of several tree species for short-rotation forestry. Paper presented at 4th European Countries Biomass for Energy Conference, Orleans, France.

244
Geyer, W.A. 1987. Overview of short-rotation energy plantation research in the United States. pp. 161-167. IN Proc., International Conference on Residential Wood Energy.

245
Geyer, W.A., L. Melichar, and C.E. Long. 1987. Preemergent herbicide trials with direct-seeded black locust grown in different soils. J. of Arboriculture 13(4):105-107.

246
Geyer, W.A. 1986. Production and thermoconversion of short-rotation woody biomass. Poster presented at International Congress on Renewable Energy Sources, May 18-23, 1986, Madrid, Spain.

247
Geyer, W.A., and M.W. Melichar. 1986. Short-rotation forestry research in the United States. Biomass 9(2):125-133.

248
Geyer, W.A., and W.P. Walawender. 1986. Production and thermochemical conversion of short-rotation woody biomass. Paper presented at International Congress on Renewable Energy Sources, May 18-23, 1986, Madrid, Spain.

249
Geyer, W.A. 1985. Forestry practices in Italy. Paper presented at the Seventh Forest Biomass Workshop, June 11-14, 1985, Gainesville, Florida.

250
Geyer, W.A. 1985. Forestry practices in Italy. Paper presented at Eighth Annual NCR-135 Wood Energy Committee Meeting, October. 1985, Manhattan, Kansas.

251
Geyer, W.A. 1985. Short-rotation biomass yields. Paper presented at First Woodgrass Conference, Northwest State Missouri University, Maryville, Missouri.

252
Geyer, W.A., R.M. Argent, and W.P. Walawender. 1985. Biomass yield, wood properties and gasification behavior of 7-year-old Siberian elm. Wood Fiber Sci. 19(2)

253
Geyer, W.A., M.W. Melicahr, K.D. Lynch, and G.G. Naughton. 1985. The short-rotation woody crops program in the United States. Paper presented at 9th World Forestry Conference, Mexico City, Mexico.

254
Geyer, W.A., M.W. Melichar, and R.M. Argent. 1985. Coppicing: A centuries-old practice crucial to SRIC forestry. Paper presented at the 22nd Annual Poplar Council Meeting, June. 1985, Lawrence, Kansas.

255
Geyer, W.A., G.C. Naughton, and K.L. Lynch. 1985. Climatological variations in energy forest yields in the Central Great Plains of the United States. Paper presented at the. 1984 Southern Forest Biomass Workshop, June 5-7, 1984, U.S. Forest Service, Southern Forest Experiment Station, Ashville, North Carolina.

256
Geyer, W.A., G.G. Naughton, and M.W. Melichar. 1985. Biomass gains in coppicing trees for energy crops. pp. 269-273. IN W. Palz, J. Coombs and D.O. Hall (eds.) Proc., Energy from Biomass, 3rd European Communities Conference. Elsevier Applied Science Publishers, London.

257
Geyer, W.A. 1984. Plantation energy forests. Paper/poster presented at the 1st Kansas Forest Resources Conference, February 3-4, 1984, Topeka, Kansas.

258
Geyer, W.A. 1984. Short rotation energy forests. Paper/poster presented at Annual Kansas Agricultural Experiment Station Conference, January 5-6, 1984, Manhattan, Kansas.

259
Geyer, W.A., G.G. Naughton, and K.L. Lynch. 1984. Variations in energy forest yields in the Great Plains (abstract). pp. 121-122. IN Proc., 1st National Meeting on Biomass R&D for Energy Applications. SERI/CP430-2430. Solar Energy Research Institute, Golden, Colorado.

260
Geyer, W.A., and M.W. Melichar. 1983. Screening tests for herbicides around newly planted tree seedlings. Paper presented at Trees for Nebraska Conference, March 4-5, 1983, Lincoln, Nebraska.

261
Geyer, W.A., and M.W. Melichar. 1982. Energy-cost budgets for short-rotation forest systems. Paper presented at Southern Forest Biomass Workshop, June 16-18, 1982, Alexandria, Louisiana.

262
Geyer, W.A. 1981. Growth, yield and woody biomass characteristics of several short-rotation hardwoods. Wood Sci. 13(4):209-215.

263
Geyer, W.A., and G.G. Naughton. 1981. Short-rotation biomass yields and cost analysis in eastern Kansas. Paper presented at Southern Forest Biomass Workshop, Georgetown, South Carolina.

264
Geyer, W.A., and G.G. Naughton. 1980. Biomass yield and cost analysis (4th year) of various tree species grown under a short-rotation management scheme in eastern Kansas. pp. 315-329. IN *Proc., Central Hardwood Forest* Conference III. University of Missouri, Forestry Department, Columbia.

265
Geyer, W.A., and G.G. Naughton. 1980. Fuelwood for the University of Kansas steam-generating plant (abstract). Trans. Kans. Acad. Sci. 83(3):134-135.

266
Geyer, W.A., P Chandler, and G.G. Naughton. 1979. Woody biomass plantations for fuelwood (abstract). Trans. Kans. Acad. Sci. 82(2):86-87.

267
Geyer, W.A. 1978. Spacing and cutting cycle influence on short-rotation silver maple yield. Tree Plant. Notes 29(1):5-7, 26.

268
Geyer, W.A., G.G. Naughton, L. Gould, and J. Strine. 1978. Energy forest (abstract). Trans. Kans. Acad. Sci. 81(2):102.

269
Hall, P. 1980. Wood: Tomorrow's fuel? Kans. State Agric. 19(2):12.

270
Long, C., W.A. Geyer, W. Loucks, and D. Hamm. 1982. Chemical weed control in tree plantings. Circular MF-656. Kansas State University, Extension Service, Manhattan. 5 pp.

271
Melichar, L.D., W.A. Geyer, and C.E. Long. 1985. Seed protectants for directed seeding silver maple. Paper presented at Central Weed Control Conference, St. Louis, Missouri.

272
Melichar, M.W., and W.A. Geyer. 1983. Herbicides for direct seeding of black locust, honeylocust, and Kentucky coffeetree. Paper presented at Trees for Nebraska Conference, March 4-5, 1983, Lincoln, Nebraska.

273
Naughton, G.G. 1985. Production and harvesting costs of an 8-year-old energy plantation. Paper presented at the 22nd Annual Poplar Council Meeting, June. 1985, Lawrence, Kansas.

274
Naughton, G.G., and W.A. Geyer. 1985. Economic strategies for locating fuelwood plantations (abstract). Paper presented at International Symposium: Sustainable development of natural resources in the 3rd world, September 3-6, 1985, Columbus, Ohio.

275
Naughton, G.G., and W.A. Geyer. 1982. An economic analysis of cottonwood energy forest plantations. Paper presented at. 19th Annual North American Poplar Council Meeting, Rhinelander, Wisconsin.

276
Naughton, G.G., and W.A. Geyer. 1982. An economic analysis of energy forest plantations. pp. 94-98. IN A. Strub, P. Chartier and G. Schlesser (eds.) Proc., Energy from Biomass, 2nd European Communities Conference. Applied Science Publishers, Berlin.

277
Naughton, G.G., and N.E. Jennings. 1979. Firewood plantations. Circular C-605. Kansas State University, Cooperative Extension Service, Manhattan. 4 pp.

278
Naughton, G.G., and W.A. Geyer. 1978. Energy from wood for central steam generation. Paper presented at Great Plains Forestry Symposium, Tulsa, Oklahoma.

279
Naughton, G.G., and W.A. Geyer. 1978. Wood as a supplemental fuel to generate steam. Papar presented at Central Hardwoods Forest Conference II, Purdue University, Lafayette, Indiana.

280
Perlack, R.D., and W.A. Geyer. 1987. Wood energy plantation economics in the Great Plains. J. Energy Engineering 13(3):92-101.

281
Pinkerton, L.R., and G.G. Naughton. 1985. Growing your own firewood. Revised Bulletin L-724. Kansas State University, Manhattan. 2 pp.

282
Singh, S.K., W.P. Walawender, L.T. Fan, and W.A. Geyer. 1986. Steam gasification of cottonwood (branches) in fluidized bed. J. Wood and Fiber Science 18(2):327-344.

283
University of Kansas. 1980. The University of Kansas energy forest. Final report to the Ozarks Regional Commission. Document No. 1061-0050. Kansas State University, Department of Forestry, Manhattan.

284
Warmund, M.R., W.A. Geyer, and C.E. Long. 1983. Preemergent herbicides for direct seeding Kentucky coffeetree, honeylocust, and black locust. Tree Plant. Notes 34(3):24-27.

285
Warmund, M.R. 1980. Preemergent herbicides for seeded nursery crops. M.S. thesis. Kansas State University, Manhattan. 27 pp.

286
Warmund, M.R., C.E. Long, and W.A. Geyer. 1980. Preemergent herbicides for seeded nursery crops. J. Hortic. Science 15(6):825-826.

287
Warner, T.D., and J.A. Shelley. 1982. Fuelwood utilization in Kansas cities. J. Forestry 80(5)

MICHIGAN STATE UNIVERSITY

288
Baertsche, S.R., M.T. Yokoyama, and J.T. Hanover. 1986. Short rotation, hardwood tree biomass as potential feed: Chemical composition, nylon bag ruminal degradation and ensilement of selected species. J. Animal Science 63:2028-2043.

289
Baertsche, S.R., M.T. Yokoyama, and J.W. Hanover. 1986. Short rotation, hardwood tree biomass as potential feed 1. Chemical composition of selected species. 2. Nylon bag ruminal digestibility of selected species. 3. Ensiling characteristics of selected. pp. 45-51. IN Michigan State University Agricultural Experiment Station Research Report No. 473. East Lansing.

290
Baertsche, S.R. 1980. The potential utilization of short-rotation biomass trees as a feed source for ruminants. Ph.D. dissertation. Michigan State University, East Lansing. 126 pp.

291
Bartholic, J.F., J.W. Hanover, L. Tombaugh, K. Downey, M. Hawley, and H. Koenig. 1983. Integrated approach for utilization of bioresources for fuels, chemicals, and traditional uses. pp. 529-565. IN J. Soltes (ed.) Wood and Agricultural Residues. Academic Press, New York.

292
Bongarten, B., and J.W. Hanover. 1982. Hybridization among white, red, and blue spruces and the white x blue spruce hybrid. For. Sci. 28:129-134.

293
Brissette, J.C., J.W. Hanover, T.J. Stadt, and J.W. Hart. 1979. Improved poplars for Michigan through the Michigan State Cooperative Tree Improvement Program. pp. 115-122. IN Proc., 1979 North American Poplar Council Annual Meeting. Poplar Council, Thompsonville, Minnesota.

294
Dickmann, D.I., and K.W. Stuart. 1983. The culture of poplars in Eastern North America. Hickory Hollow Associates, Dansville, Michigan.

295
Dickmann, D.I., K.W. Goltschalk, and J.H. Bassman. 1979. Physiological studies of growth and development of young hybrid poplars. pp. 123-132. IN Proc., 1979 North American Poplar Council Annual Meeting. Poplar Council, Thompsonville, Minnesota.

296
Gockowski, R. 1981. Financial comparison of accelerated-optimal-growth to bareroot seedlings in simulated red and jack pine pulpwood plantations in Michigan. M.S. thesis. Michigan State University, East Lansing. 86 pp.

297
Gold, M. 1984. Honeylocust: Genetic variation and potential use as an agroforestry species. Ph.D. dissertation. Michigan State University, East Lansing. 165 pp.

298
Hanover, J.W. 1986. Agroforestry comes of age. Futures 4(3):12-15.

299
Hanover, J.W. 1985. Michigan State University genetics and biomass research. Briefing given at NC-99 Tree Improvement Committee Meeting, March 12-13, 1985, St. Paul, Minnesota.

300
Hanover, J.W. 1985. Michigan State University genetics research on biomass species. Briefing given at Leadership Dynamics Development Group meeting, March 29, 1985, Grand Rapids, Michigan.

301
Hanover, J.W., and R.O. Miller. 1985. Progress in tree improvement of biomass species. Paper presented at the North Central Tree Improvement Association Conference, August 12-14, 1985, East Lansing, Michigan.

302
Hanover, J.W. 1984. Advanced generation breeding in tree improvement. Paper presented at Great Plains Agricultural Res. Council Meeting, June 26-28, 1984, Watertown, South Dakota.

303
Hanover, J.W. 1984. Screening and breeding trees for high value chemicals. Paper presented at International Symposium on Recent Advances in Forest Biotechnology, June 10-14, 1984, Traverse City, Michigan.

304
Hanover, J.W., and D.I. Dickmann. 1982. Systems for production of improved stock for intensive culture. Paper presented at 7th North American Forest Biology Workshop, July 26-28, 1982, Lexington, Kentucky.

305
Hanover, J.W. 1980. Control of tree growth. BioScience 30(11):756-762.

306
Hanover, J.W. 1980. Horizons in research on primary productivity of forests. Paper presented at 6th North American Forest Biology Workshop, July 11-13, 1980, Edmonton, Alberta.

307
Hanover, J.W., and J.W. Hart. 1980. Greenhouse trees. Southern Florist Nurseryman:20-21, 66-69.

308
Hanover, J.W., O. Okafo, J. Brissette, and J.W. Wright. 1980. A directory of forest genetic plantings in Michigan. Res. Rep. 395. Michigan State University, Agriculture Experiment Station, East Lansing. 16 pp.

309
Hart, J., and J.W. Hanover. 1980. Practical requirements for controlled environment nursery stock production. pp. 304-313. IN Proc., 1979 International Plant Propagators Society Annual Meeting. St. Louis, Missouri.

310
Kudray, G.M., and J.W. Hanover. 1980. A preliminary evaluation of the Spartan spruce (*Picea glauca* x *P. pungens*). Res. Rep. 405. Michigan State University, Agriculture Experiment Station, East Lansing. 16 pp.

311
Levensen, B. 1984. Economic analysis of tree improvement research in Michigan. Ph.D. dissertation. Michigan State University, East Lansing. 176 pp.

312
Michael, D.A., D.I. Dickmann, K.W. Gottschalk, N.D. Nelson, and J.G. Isebrands. 1985. Determining photosynthesis of tree leaves in the field using a portable $^{14}CO_2$ apparatus: Procedures and problems. Photosynthetica 19(1):98-108.

313
Michael, D.A., H.M. Rauscher, J.G. Isebrands, T.R. Crow, R.E. Dickson, and D.I. Dickmann. 1985. An ecophysiological growth model of poplar. I. Leaf orientation, light interception, and photosynthate production (abstract). pp. 82-83. IN Proc., Coupling of Carbon, Water, and Nutrient Interactions in Woody Plant Soil Systems. International Symposium on Whole-Plant Physiology. CONF-851050-Absts.

314
Michigan State University. 1981. Biomass: Fuel for the future. Special Report 1. Michigan State University, Agricultural Experiment Station, East Lansing. 16 pp.

315
Michigan State University. 1980. Michigan's energy challenge: Forging a new future. 1980-81 legislative budget request for energy opportunities line item. Special Report. Michigan State University, Agricultural Experiment Station, East Lansing. 5 pp.

316
Miller, R.O. 1985. Overview and results of Michigan State University biomass plantation research. Paper presented at Soil Conservation Service Annual Regional Meeting, March 14, 1985, Lansing, Michigan.

317
Miller, R.O. 1984. Woody-biomass production in Michigan: Species, genotype, and cultural investigations. Ph.D. dissertation. Michigan State University, East Lansing. 92 pp.

318
Miller, R.O., B. Levenson, and G. Howe. 1984. The costs of genetic test plantations. MICHCOTIP Notes Vol. 1, No. 1. Michigan State University, East Lansing. 9 pp.

319
Reighard, G.L., G. Howe, and J.W. Hanover. 1985. Effects of chemical weed control and seedling planting depth on survival and growth of aspen. Tree Plant. Notes:3-7.

320
Reighard, G.L. 1984. Physiological genetics studies of *Populus grandidentata*, *P. tremuloides* and their hybrid, *Populus* x *smithii*. Ph.D. dissertation. Michigan State University, East Lansing. 110 pp.

321
Stadt, T.S., and J.W. Hanover. 1983. Recommended tree seed sources for use in Michigan. Res. Rep. 445. Michigan State University, Agricultural Research Station, East Lansing. 7 pp.

322
Wood, B., and J.W. Hanover. 1981. Accelerating the growth of black walnut seedlings. Tree Plant. Notes 32:35-38.

323
Woods, R.F., and J.W. Hanover. 1983. Growth characteristics of Imperial Carolina poplar over a range of soil types. Tree Plant. Notes 33:8-13.

MICHIGAN TECHNOLOGICAL UNIVERSITY

324
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1986. Seasonal development of a young plantation of *Eucalyptus nitens*. N. Z. J. For. Sci. 16(1):78-86.

325
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1985. Dry matter content and nutrient distribution in an age series of *Eucalyptus regnans* plantations in New Zealand. N. Z. J. For. Sci. 15(2):158-179.

326
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1985. Dry matter, energy, and nutrient contents of 8-year-old stands of *Eucalyptus regnans*, *Acacia dealbata*, and *Pinus radiata* in New Zealand. N. Z. J. For. Sci. 15(2):142-157.

327
Frederick, D.J., H.A.I. Madgwick, G.R. Oliver, and M.F. Jurgensen. 1985. Dry matter and nutrient content of 8-year-old *Eucalyptus saligna* growing at Taheke Forest. N. Z. J. For. Sci. 15(2):251-254.

328
Hamlin, D. 1980. Spatial and temporal variability of available nitrogen in some spodic forest soils. M.S. thesis. Michigan Technological University, Houghton.

329
Lai, Y.Z., R.L. Sajdak, G.D. Mroz, M.F. Jurgensen, and D.L. Schwandt. 1980. Wood and bark specific gravity determination as affected by water-soluble extractives loss. Wood Sci. 13(1):47-49.

330
Miyata, E.S., H.M. Steinhilb, R.L. Sajdak, and M.S. Coffman. 1982. Roller chopping for site preparation in Wisconsin: A case study. NC-223. U.S. Forest Service, North Central Forest and Experiment Station.

331
Mroz, G.D., D.J. Frederick, and M.F. Jurgensen. 1985. Site and fertilizer effects on northern hardwood stump sprouting. Can. J. For. Res. 15:535-543.

332
Mroz, G.D., M.F. Jurgensen, and D.J. Frederick. 1985. Soil nutrient changes following whole tree harvesting on three northern hardwood sites. Soil Sci. Soc. Am. J. 49:1552-1557.

333
Mroz, G.D., M.R. Gale, M.F. Jurgensen, D.J. Frederick, and A. Clark III. 1984. Composition, structure, and standing crop biomass of two climax northern hardwood stands in upper Michigan. Can. J. For. Res. 15:78-82.

334
Mroz, G.D., D.J. Frederick, M.F. Jurgensen, R. Sajdak, A. Clark III, D. Phillips, and K. Slattery. 1979. Biomass and nutrient removal on three northern hardwood sites in upper Michigan. pp. 408. IN Proc., Symposium on Impact on Intensive Harvesting on Forest Nutrient Recycling. State University of New York, Syracuse.

335
Perkis, B.A. 1982. Selection of *Rhizobium* spp. for increased forest productivity in Michigan's upper peninsula. M.S. thesis. Michigan Technological University, Houghton.

336
Phillips, K.J. 1982. The development and comparison of weight regressions for small size classes of red and sugar maple sprouts. M.S. thesis. Michigan Technological University, Houghton.

337
Sajdak, R.L., Y.Z. Lai, G.D. Mroz, and M.F. Jurgensen. 1981. Forest biomass for energy: A perspective. pp. 21-48. IN D.L. Klass (ed.) Biomass as a nonfossil fuel source. Symposium Series No. 144. American Chemical Society.

338
Simonds, G. 1982. Variability of *Rhizobium* and *Mycorrhizae* on several sources of black locust. M.S. thesis. Michigan Technological University, Houghton.

339
Steinhilb, H.M., E.S. Miyata, and T.P. Crow. 1983. Green above-stump weights of red oak, red maple, and white birch in Northern Michigan. NC-230. U.S. Forest Service, North Central Forest Experiment Station.

340
Wegiel, B.A. 1981. Selection of *Rhizobium* for increased forest productivity in Michigan's upper peninsula. M.S. thesis. Michigan Technological University, Houghton.

UNIVERSITY OF MINNESOTA

341
Berguson, W.E., and D.F. Grigal. 1985. Clonal screening of *Populus* and *Salix* for short rotation forestry on peatlands (abstract). Agronomy Abstracts:215-216.

342
Connolly, B.J., and D.F. Grigal. 1983. Biomass estimation equations for wetland tall shrubs. Minn. For. Res. Notes. No. 284. 4 pp.

343
Connolly, B.J. 1981. Shrub biomass-soil relationships in Minnesota wetlands. M.S. thesis. University of Minnesota, St. Paul.

344
Connolly-McCarthy, B.J., and D.F. Grigal. 1985. Biomass of shrub-dominated wetlands in Minnesota. For. Sci. 31(4):1011-1017.

345
Farnham, R.S., W.E. Berguson, T.E. Levar, and D.B. Sherf. 1982. Peatland reclamation: The energy crop option. pp. 635-642. IN Peat as an energy alternative. Institute of Gas Technology, Chicago.

346
Farnham, R.S., W.E. Berguson, T.E. Levar, and D.B. Sherf. 1982. Woody bioenergy crop production on marginal lands. Paper presented at. 19th Annual Meeting of North American Poplar Council Conference, July 20-22, 1982, Rhinelander, Wisconsin.

347
Garton, S., P.E. Read, and R.S. Farnham. 1983. Effect of stock plant nutrition on the macro- and micro-propagability of *Salix*. Acta Hortic. 131:141-151.

348
Garton, S., M. Hosier, P.E. Read, and R.S. Farnham. 1981. *In vitro* propagation of *Alnus glutinosa* Gaertn. J. Hortic. Science 16(6):758-759.

349
Hosier, M.A., S. Garton, P.E. Read, and R.S. Farnham. 1981. *In vitro* propagation of *Alnus glutinosa*. J. Hortic. Science 16(6):758-759.

350
Read, P.E., S. Garton, K.A. Louis, and E.S. Zimmermann. 1982. *In vitro* propagation of species for bioenergy plantation. Paper presented at Fifth International Congress of Plant Tissue and Cell Culture, July 11-16, 1982, Tokyo, Japan.

MISSISSIPPI STATE UNIVERSITY

351
Anonymous. 1987. Sycamores may answer future energy needs. Arbor Age 7(3):3.

352
Land Jr., S.B., G.A. Tuskan, S.G. Dicke, and P.E. Patterson. 1983. Genetic, site, and within-tree variation in specific gravity and moisture content of young sycamore trees. TAPPI 66(3):149-153.

353
Land Jr., S.B. 1982. Genetic selection of American sycamore for biomass production in the mid-south. Final report for the period March 9, 1979-May 31, 1982. ORNL/Sub/81-9051/1. Mississippi State University, Mississippi State. 114 pp.

354
Land Jr., S.B. 1980. Genetic selection of American sycamore for biomass production in the mid-south: Phase I. SERI/TR-98075-1. Mississippi State University, Mississippi State. 45 pp.

355
Schultz, E.B., and S.B. Land Jr. 1987. Juvenile-mature correlations in sycamore. pp. 376-383. IN Proc., 19th Southern Forest Improvement Conference. National Technical Information Service, Springfield, Virginia.

356
Tuskan, G.A. 1980. Genetic variation and prediction equations for biomass components in plantation-grown American sycamore. M.S. thesis. Mississippi State University, Department of Forestry, Mississippi State. 78 pp.

NORTH CAROLINA STATE UNIVERSITY

357
Ariyadasa, K.P., and D.J. Frederick. 1987. Aboveground biomass estimation for seven tree species growing on the coastal plain of Georgia. Hardwood Research Cooperative internal report. North Carolina State University, Raleigh. 11 pp.

358
Ballard, R., and R. Lea. 1981. Foliar analysis for predicting quantitative fertilizer response: The importance of stand and site variables to the interpretation. Paper presented at XVII IUFRO World Congress, September 6-17, 1981, Kyoto, Japan.

359
Brenneman, B.B., D.J. Frederick, W.E. Gardner, L.H. Schoenhofen, and P.L. Marsh. 1978. Biomass of species and stands of West Virginia hardwoods. pp. 159-178. IN Proc., Central Hardwood Forest Conference II. Purdue University, West Lafayette.

360
Brotschol, J.V. 1983. A study on some mating system parameters among three populations of *Liriodendron tulipifera*, using electrophoretic techniques. Ph.D. dissertation. North Carolina State University, School of Forest Resources, Raleigh. 98 pp.

361
Clark III, A., D.R. Phillips, and D.J. Frederick. 1986. Weight, volume, and physical properties of major hardwood species in the upland-South. SE-257. U.S. Forest Service, Southeast Experiment Station. 55 pp.

362
Clark III, A., D. Phillips, and D.J. Frederick. 1986. Weight, volume, and physical properties of major hardwood species in the Piedmont. SE-255. U.S. Forest Service, Southeast Experiment Station. 78 pp.

363
Clark III, A., D.R. Phillips, and D.J. Frederick. 1985. Weight, volume, and physical properties of major hardwood species in the Gulf and Atlantic Coastal Plains. SE-250. U.S. Forest Service, Southeast Experiment Station. 66 pp.

364
Clark III, A., D.R. Phillips, and D.J. Frederick. 1984. *Using segmented log-log equations for* estimating tree biomass. Paper presented at Southern Forest Biomass Workshop, June 5-7, 1984, University of Georgia, Athens.

365
Clark III, A., D.R. Phillips, and D.J. Frederick. 1983. Biomass distribution and production of coastal plain hardwood stands. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes VII. Institute of Gas Technology, Chicago.

366
Cunningham, M.W. 1986. Evaluation of the potential of clonal forestry for a population of American sycamore. M.S. thesis. North Carolina State University, Raleigh.

367
Cunningham, M.W. 1986. Genetic variation in rooting ability of American sycamore cuttings. pp. 6. IN Proc., 1986 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

368
Ellwood, E.L. 1987. Short rotation woody crops research at North Carolina State University. Presentation made to Senator Jesse Helms and the North Carolina Congressional delegation, September, 1987.

369
Frederick, D.J. 1987. Biomass, nutrient and energy research at North Carolina State. Presentation to the North Carolina State University Hardwood Research Cooperative Advisory Board Representatives, June, 1987, Atlanta, Georgia.

370
Frederick, D.J., R. Lea, A. Clark III, and D.R. Phillips. 1987. Site classification and productivity of hardwood wetlands in the southern United States. Paper presented at the Eighth Annual Meeting, Society of Wetland Scientists, May, 1987, Seattle, Washington.

371
Frederick, D.J., T. Tew, A. Clark III, and D.R. Phillips. 1987. Biomass, nutrient and energy content of upland south hardwood forests. Hardwood Research Cooperative Series No. 6. North Carolina State University, School of Forest Resources, Raleigh. 33 pp.

372
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1986. Seasonal development of a young plantation of *Eucalpytus nitens*. N. Z. J. For. Sci. 16(1):78-86.

373
Frederick, D.J., and M.A. Megalos. 1986. Woody biomass energy plantations. pp. 10. IN Biomass Handbook. Gordon and Breach Publ.

374
Frederick, D.J., B.J. Stokes, and D.T. Curtin. 1986. Field trials of a Canadian biomass feller-buncher. pp. 17-22. IN Proc., 1985 Southern Forest Biomass Workshop. University of Florida, Gainesville.

375
Frederick, D.J., and R. Lea. 1985. Southern bottomland hardwood site classification. Paper presented at the IUFRO Workshop on Forest Site Classification, October 7-10, 1985, Fredericton, New Brunswick.

376
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1985. Dry matter content and nutrient distribution in an age series of *Eucalyptus regnans* plantations in New Zealand. N. Z. J. For. Sci. 15(2):158-179.

377
Frederick, D.J., H.A.I. Madgwick, M.F. Jurgensen, and G.R. Oliver. 1985. Dry matter, energy, and nutrient contents of 8-year-old stands of *Eucalyptus regnans*, *Acacia dealbata*, and *Pinus radiata* in New Zealand. N. Z. J. For. Sci. 15(2):142-157.

378
Frederick, D.J., H.A.I. Madgwick, G.R. Oliver, and M.F. Jurgensen. 1985. Dry matter and nutrient content of 8-year-old *Eucalyptus saligna* growing at Taheke Forest. N. Z. J. For. Sci. 15(2):251-254.

379
Frederick, D.J., A. Clark III, and D.R. Phillips. 1984. A cooperative approach for assessing biomass and energy yields of southeastern hardwood forests. Paper presented at Energy from Biomass Technical Review Meeting, November. 1984, Atlanta, Georgia.

380
Frederick, D.J., M.G. Messina, S.T. Gower, A. Clark III, and D.R. Phillips. 1984. Southeastern wetland hardwood forests: An emerging resource. pp. 277-283. IN Proc., 1984 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

381
Frederick, D.J. 1983. Biomass relationships of coastal plain hardwoods. pp. 74-80. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

382
Frederick, D.J. 1983. Natural regeneration systems. pp. 13-17. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

383
Frederick, D.J., A. Clark III, and D. Phillips. 1983. Biomass, nutrient, and energy relationships of coastal plain hardwoods. Paper presented at the Hardwood Research Council Symposium, May. 1983, Cashiers, North Carolina.

384
Frederick, D.J. 1982. Needs and future direction for biomass research and application: A university perspective. Paper presented at Southern Forest Biomass Working Group Workshop, June 16-18, 1982, Alexandria, Louisiana.

385
Frederick, D.J., H.A.I. Madgwick, and G.R. Oliver. 1982. Wood basic density and moisture content of young *Eucalyptus regnans* grown in New Zealand. N. Z. J. For. Sci. 12:494-500.

386
Frederick, D.J., H.A.I. Madgwick, M. Jurgensen, and G. Oliver. 1981. Dry matter and nutrient relations in 8-year-old *Acacia dealbata*, *Eucalyptus regnans* and *Pinus radiata*. pp. 344. IN Proc., Australian Forest Nutrition Workshop. Commonwealth Scientific and Industrial Research Organization, Canberra, Australia.

387
Frederick, D.J. 1980. Energy from existing forests and energy plantations. Paper prepared for the Subcommittee on Energy Management, North Carolina Academy of Science, Raleigh.

388
Frederick, D.J., and M. Williford. 1980. Energy plantations: A future source of biomass. Paper presented at the International Solar Energy Society, American Section, Annual Meeting, June, 1980, Phoenix, Arizona.

389
Frederick, D.J., and M. Williford. 1980. Wood energy and short-rotation concepts. Paper presented at the Hardwood Management Short Course, June, 1980, North Carolina State University, Raleigh.

390
Frederick, D.J. 1979. Biomass production in intensively cultured energy plantations. Paper presented at West Virginia Chapter Meeting, Society of American Foresters, November, 1979, Beckley, West Virginia.

391
Frederick, D.J., W.E. Gardner, A. Clark III, D. Phillips, and M. Williford. 1979. Biomass and nutrient distribution in hardwood forests of the southern coastal plain (abstract). pp. 394. IN Proc., Symposium on Impact of Intensive Harvesting on Forest Nutrient Recycling. State University of New York, Syracuse.

392
Frederick, D.J., W.E. Gardner, A. Clark III, D. Phillips, and M. Williford. 1979. Biomass estimation of mixed southern hardwoods using an area sampling technique. Paper presented at Forest Resources Inventory Worksho, July 23-26, 1979, Fort Collins, Colorado.

393
Frederick, D.J., W.E. Gardner, R.C. Kellison, B.B. Brenneman, and P. Marsh. 1979. Area sampling predicts weight yields in West Virginia mountain hardwood stands. J. For. 77:762-764.

394
Frederick, D.J., R.C. Kellison, W.E. Gardner, M. Williford, and T.K. Slichter. 1979. Species selection and silvicultural systems for producing fuels from woody biomass in the southeastern United States. pp. 387-392. IN Proc., 3rd Annual Biomass Energy Systems Conference. Colorado School of Mines, Golden, Colorado.

395
Frederick, D.J. 1978. Fuel plantations: A renewable source of energy for North Carolina. pp. 91-92. IN Proc., Energy Technologies and Policies for North Carolina. Environmental Studies Council, Raleigh, North Carolina.

396
Frederick, D.J. 1978. Wood for energy: Status and current research at N. C. State. Paper prepared for the Hardwood Shortcourse, May 23-25, 1978, North Carolina State University, School of Forest Resources, Hardwood Research Cooperative, Raleigh.

397
Frederick, D.J., and W.E. Gardner. 1978. Wood as an energy source in North Carolina. pp. 131-132. IN Proc., Energy Technologies and Policies for North Carolina. Environmental Studies Council, Raleigh, North Carolina.

398
Gardner, W.E. 1981. Effect of tract size on the cost of reforestation. M.S. thesis. North Carolina State University, School of Forest Resources, Raleigh. 44 pp.

399
Gardner, W.E., P.L. Marsh, R.C. Kellison, and D.J. Frederick. 1981. Yields of natural hardwood stands in the southeastern United States. Hardwood Research Report No. 1. North Carolina State University, Raleigh. 62 pp.

400
Gardner, W.E. 1980. Economic comparison of natural regeneration with plantation management. Paper presented at the Hardwood Management Short Course, June. 1980, North Carolina State University, Raleigh.

401
Gardner, W.E. 1980. Yields of natural hardwood stands in the southeastern United States. Paper presented at the Hardwood Management Short Course, June, 1980, North Carolina State University, Raleigh.

402
Gardner, W.E. 1980. Yields of natural hardwood stands in the southeastern United States. Paper presented at the Second Annual Southern Forest Biomass Working Group Meeting, June 26, 1980, North Carolina State University, Raleigh.

403
Gardner, W.E., D.J. Frederick, and R.C. Kellison. 1980. Hardwood growth and yield on various sites in the southeastern United States. Paper presented at the Third Central Hardwood Forest Conference, September 16-17, 1980, Columbia, Missouri.

404
Gardner, W.E. 1978. Energy from wood: Some perspectives. pp. 87-88. IN Proc., Energy Technologies and Policies for North Carolina. Environmental Studies Council, Raleigh, North Carolina.

405
Gardner, W.E., D.J. Frederick, B.B. Brenneman, and P.L. Marsh. 1978. Variation in wood properties of Appalachian hardwoods. Paper presented at IUFRO Symposium on Establishment and Treatment of High-Quality Hardwood Forests in the Temperate Climatic Region, Nancy, France.

406
Goncalves, P. DeSouza, and R.C. Kellison. 1980. Potential of black alder in the South. Tech. Rep. No. 22. North Carolina State University, School of Forest Resources, Raleigh. 31 pp.

407
Gower, S.T., R. Lea, and D.J. Frederick. 1985. Aboveground energy production and distribution of southeastern hardwood swamp forests. Biomass 7:185-197.

408
Gower, S.T., D.J. Frederick, and A. Clark III. 1984. Distribution of energy in different-aged southeastern bottomland forests. For. Ecol. Manage. 9:127-146.

409
Gower, S.T. 1983. Energy content and distribution of different-aged southeastern swamp, wet flat, and river bottom hardwood forests. pp. 87-91. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

410
Gower, S.T., R. Lea, D.J. Frederick, and A. Clark III. 1983. Muck and peat swamp aboveground productivity in the Atlantic and Gulf Coastal Plains. Paper presented at Society of Wetland Scientists Meeting, June. 1983, Minneapolis, Minnesota.

411
Gower, S.T., D.J. Frederick, and A. Clark III. 1982. Caloric content estimation and distribution in seven bottomland hardwood tree species growing in natural stands in the South. pp. 384-390. IN Proc., Fourth Central Hardwood Forest Conference. University of Kentucky, Lexington.

412
Howard, J. 1986. Predicting productivity for prospective upper coastal plain hardwood plantation sites as a function of chemical and physical site factors. Ph.D. dissertation. North Carolina State University, School of Forest Resources, Raleigh. 114 pp.

413
Johnson, G.R., and R.C. Kellison. 1984. Sycamore seedlings from the nursery: Not the same genetic composition as the collected seedlot. Tree Plant. Notes 35(3):34-35.

414
Jurgensen, M.F., D.J. Frederick, H.A.I. Madgwick, and G.R. Oliver. 1986. Soil development under *Pinus radiata* and *Eucalyptus regnans* plantations. N. Z. J. For. Sci. 16(1):69-77.

415
Kellison, R.C. 1981. Characteristics affecting quality of timber from plantations, their determination and scope for modification. Paper presented at IUFRO XVII World Congress, September 6-17, 1981, Kyoto, Japan.

416
Kellison, R.C. 1987. Developing a forest policy amid competition from abroad. Forum 2(4):6-9.

417
Kellison, R.C. 1987. Extending the hardwood timber supply. Paper presented at Symposium on Maine's Hardwood Resource: Quantity vs. Quality, Augusta, Maine.

418
Kellison, R.C. 1986. Future technology and timber supply may change construction lumber products. Forest Farmer 45:24-26.

419
Kellison, R.C. 1985. Effects of changing technologies on wood requirements, stumpage prices, and forest management strategies. Paper presented at the Triennial Meeting, Southern Extension Forestors, October 17, 1985, Charleston, South Carolina.

420
Kellison, R.C. 1985. Forest resource technology and transfer in developing countries. Paper presented at the International Forestry Working Session, Society of American Foresters Annual Convention, July 29-31, 1985, Fort Collins, Colorado.

421
Kellison, R.C. 1985. Seed procurement and nursery management of the southern pines in the People's Republic of China. Paper presented at International Symposium on Nursery Management Practices for the Southern Pines, August 4-9, 1985, Auburn, Alabama.

422
Kellison, R.C., and R.G. Hitchings. 1985. Harvesting more young southern pines will require pulpmill changes. Pulp & Paper 59(7):53-56.

423
Kellison, R.C. 1984. Increasing forest productivity and value by managing hardwoods on selected sites within the temperate coniferous forest. Paper presented at Weyerhaeuser Company's Forest Potential Symposium, September. 1984, Tacoma, Washington.

424
Kellison, R.C. 1983. The total biomass concept: Its impact on traditional silviculture. Paper presented at the Fifth Annual Southern Forest Biomass Workshop, June, 1983, Charleston, South Carolina.

425
Kellison, R.C., R. Lea, and D.J. Frederick. 1983. Effect of silvicultural practices on wood quality of southern hardwoods. TAPPI 66(1):67-69.

426
Kellison, R.C. 1982. Cost considerations for regenerating hardwood natural stands and plantations. Paper presented at Workshop on Cost-Effective Regeneration, Clemson University, Clemson, South Carolina.

427
Kellison, R.C. 1982. Doing hardwood management research. Paper presented at the Hardwood Research Council Symposium, May 13-15, 1982, Cashiers, North Carolina.

428
Kellison, R.C. 1982. Tree farming in the southern United States. Paper presented at Annual Meeting of the Technical Association of the Pulp and Paper Industry of Mexico, May 28, 1982, Mexico City.

429
Kellison, R.C., and R. Lea. 1982. Progeny test methodology: Raising seedlings. Paper presented at S-23 Workshop on Progeny Test Methodology, June 15-16, 1982, Auburn University, Auburn, Alabama.

430
Kellison, R.C., and J. Sprague. 1982. Forest genetics for tomorrow's southern pine forests. Pulp and Paper 55(6):187-191.

431
Kellison, R.C. 1981. Progress in hardwood tree improvement. Forest Farmer 41:14-15.

432
Kellison, R.C., D.J. Frederick, and W.E. Gardner. 1981. A guide for regenerating and managing natural stands of southern hardwoods. Bulletin No. 463. North Carolina State University, Agricultural Research Service, Raleigh. 28 pp.

433
Kellison, R.C. 1980. Cultural practices for optimizing productivity of eucalypts for fiber and energy. Paper presented at the IUFRO Symposium and Workshop on Genetic Improvement and Productivity of Fast-Growing Trees, August 25, 1980, Sao Paulo, Brazil.

434
Kellison, R.C. 1980. Early natural stand growth in hardwoods. Paper presented to the Southeastern Lumber Manufacturer's Association Hardwood Symposium, January 29, 1980, Atlanta, Georgia.

435
Kellison, R.C. 1980. Genetically improved hardwoods. Paper presented at the Eighth Annual Hardwood Research Council Meeting, April 24-26, 1980, Cashiers, North Carolina.

436
Kellison, R.C. 1980. Tree improvement of southern hardwoods and exotics. Paper presented at the Hardwood Management Short Course, June. 1980, North Carolina State University, Raleigh.

437
Kellison, R.C., D.J. Frederick, and W.E. Gardner. 1980. Harvesting to favor reproduction of southern hardwoods. Paper presented at the Tenth Forestry and Wildlife Forum, April 17-18, 1980, Virginia Polytechnic Institute and State University, Blacksburg.

438
Kellison, R.C., and R.J. Weir. 1980. How forest genetics is helping grow better trees for tomorrow. TAPPI 63:57-61.

439
Kellison, R.C. 1979. Advances in tropical tree improvement. Paper presented at the International Symposium on Forest Sciences and Their Contribution to the Development of Tropical America, October. 1979, San Jose, Costa Rica.

440
Kellison, R.C. 1979. The making of a cooperative forestry program. Paper presented to Canadian Tree Improvement Association, September 30, 1979, Gander, Newfoundland.

441
Kellison, R.C., and W.E. Gardner. 1979. Future prospects for fast-growing broad-leaved trees for plantations in the southern U.S.A. Paper presented at FAO-IUFRO Consultation on Fast-Growing Plantation Broad-Leaved Trees for Mediterranean and Temperate Zones, Lisbon, Portugal.

442
Kellison, R.C., T.K. Slichter, and D.J. Frederick. 1979. Increased wood production from matching species to site. TAPPI 62(8):77-79.

443
Kellison, R.C., and G. White. 1979. Black alder performance in the Southeast. Paper presented at Symposium on Symbiotic Nitrogen Fixation in the Management of Temperate Forests, June, 1979, Oregon State University, Corvallis.

444
Kellison, R.C. 1978. Genetic manipulation of southern hardwoods. pp. 111-120. IN Proc., Eighth Forestry and Wildlife Symposium. Virginia Polytechnic Institute and State University, Blacksburg.

445
Kellison, R.C. 1977. Hardwood tree improvement in the Southeast. Paper presented at the Northeastern Area Nurserymen's Conference, August 16-18, 1977, Staunton, Virginia.

446
Kenny, K.M. 1983. Growth and yield of natural Piedmont bottomland hardwoods. pp. 67-73. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

447
Lea, R. 1987. Response of wetland forests to pumped agricultural waste-water. IN G.M. Chescheir, J.W. Gilliman, R.W. Skaggs, and R.G. Broadhead (eds.) The hydrology and pollutant removal effectiveness of wetland buffer areas receiving pumped agricultural drainage water. Report 231. University of North Carolina, Water Resources Institute, Raleigh.

448
Lea, R. 1987. Sweetgum handbook: Short-rotation sweetgum plantations, establishment and care in the southeastern United States. ORNL/Sub/86-95909/1. North Carolina State University, Raleigh. 31 pp.

449
Lea, R. 1986. Fertilization of northern hardwoods. Paper presented at the Northern Hardwood Symposium, Houghton, Michigan.

450
Lea, R. 1986. Impact of whole-tree harvesting on nutrient capital. Presentation at Short Rotation Woody Crops Subcontractors' Meeting, Ames, Iowa.

451
Lea, R. 1985. Aboveground biomass, nutrient, energy, and growth and yield of bottomland hardwood forests. Paper presented at Characterization of Bottomland Hardwood Forests Symposium, Francisville, Louisiana.

452
Lea, R. 1982. Biomass and nutrient drain research. Paper presented at the Southern Industrial Forest Research Council, May 11, 1982, Atlanta, Georgia.

453
Lea, R., L.R. Auchmoody, and W.E. Carmean. 1984. Hardwood forest soils: Past, present, and future. Paper presented at Sixth North American Forest Soils Conference, Knoxville, Tennessee.

454
Lea, R., and R. Ballard. 1982. Predicting loblolly pine growth response from N fertilizer using soil-N availability indices. Soil Sci. Soc. Am. J. 46:1096-1099.

455
Lea, R., and R. Ballard. 1982. Relative effectiveness of nutrient concentrations in living foliage and needle fall at predicting response of loblolly pine to N and P fertilization. Can. J. For. Res. 12:713-717.

456
Lowerts, G.A., and J.M. Stone. 1983. The effect of soil bulk density on nursery sweetgum seedling growth. Tree Plant. Notes 33:3-5.

457
McCutchan, B.G. 1982. Effect of harvest season and spacing on coppice sweetgum biomass yields. pp. 113-124. IN Proc., Fourth Central Hardwood Conference. University of Kentucky, Lexington.

458
Megalos, M.A., D.J. Frederick, A. Clark III, and D.R. Phillips. 1986. A comparison of biomass and nutrient content in Piedmont and Coastal Plain bottomland hardwood stands. Paper presented at the Fourth Biennial Silvicultural Research Conference, November, 1986, Atlanta, Georgia.

459
Megalos, M.A., D.J. Frederick, A. Clark III, and D.R. Phillips. 1986. Biomass and energy content of southern Piedmont hardwood forests. pp. 72. IN Proc., Fourth Southern Biomass Energy Research Conference. University of Georgia, Athens.

460
Megalos, M.A., D.J. Frederick, A. Clark III, and D.R. Phillips. 1986. Biomass, nutrient and energy content of southern Piedmont hardwood forests. Hardwood Research Cooperative Series No. 5. North Carolina State University, School of Forest Resources, Raleigh. 33 pp.

461
Messina, M.G., D.J. Frederick, and A. Clark III. 1986. Nutrient content distribution in natural southern coastal plain hardwoods. Biomass 10:59-79.

462
Messina, M.G., S.T. Gower, D.J. Frederick, A. Clark III, and D. Phillips. 1984. Biomass, nutrient, and energy content of wetland forests. Hardwood Research Cooperative Series No. 2. North Carolina State University, Raleigh. 28 pp.

463
Messina, M.G. 1983. Nutrient content and distribution in coastal plain hardwoods. pp. 81-86. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

464
Messina, M.G., R. Ballard, and D.J. Frederick. 1983. A test of a single disk for estimation of hardwood bole and branch nutrient concentrations. For. Sci. 19:618-626.

465
Messina, M.G. 1980. A sampling scheme for determining nutrient content and distribution in southern bottomland hardwoods. Paper presented at the Second Annual Southern Forest Biomass Working Group Meeting, June, 1980, North Carolina State University, Raleigh.

466
Messina, M.G. 1980. Nutrient levels, distribution and variation in three bottomland hardwood species. Paper presented at the Third Central Hardwood Forest Conference, September 16-17, 1980, Columbia, Missouri.

467
Messina, M.G., and D.J. Frederick. 1980. Biomass and nutrient distribution in southern bottomland hardwoods. Paper presented at the Hardwood Management Short Course, June. 1980, North Carolina State University, Raleigh.

468
Messina, M.G., D.J. Frederick, W.E. Gardner, M. Williford, A. Clark III, and D.R. Phillips. 1980. Biomass and nutrient relationships in coastal plain hardwoods. Paper presented at the Southern Silvicultural Research Conference, November 6-7, 1980, Atlanta, Georgia.

469
Mroz, G.D., D.J. Frederick, and M.F. Jurgensen. 1985. Site and fertilizer effects on northern hardwood stump sprouting. Can. J. For. Res. 15:535-543.

470
Mroz, G.D., M.R. Gale, M.F. Jurgensen, D.J. Frederick, and A. Clark III. 1984. Composition, structure, and standing crop biomass of two climax northern hardwood stands in upper Michigan. Can. J. For. Res. 15:78-82.

471
Mroz, G.D., D.J. Frederick, M.F. Jurgensen, R. Sajdak, A. Clark III, D. Phillips, and K. Slattery. 1979. Biomass and nutrient removal on three northern hardwood sites in upper Michigan. pp. 408. IN Proc., Symposium on Impact on Intensive Harvesting on Forest Nutrient Recycling. State University of New York, Syracuse.

472
North Carolina State University. 1985. Hardwood Research Cooperative Annual Report. North Carolina State University, Raleigh. 75 pp.

473
Otegbeye, G.O., and R.C. Kellison. 1980. Genetics of wood and bark characteristics of *Eucalyptus viminalis*. Silvae Genet. 40:27-31.

474
Paschke, J.L., G.R. Johnson, and W.E. Gardner. 1981. Genetic aspects of nursery management for sweetgum seedling uniformity. Paper presented at 16th Southern Forest Tree Improvement Conference, Virginia Polytechnic Institute and State University, Blacksburg.

475
Phillips, D.R., A. Clark III, D.J. Frederick, and M. Messina. 1983. Estimating biomass, nutrient, and energy content of lowland hardwoods in the southern United States. Paper presented at International Union of Forestry Research Organizations Conference, October. 1983, Orleans, France.

476
Purnell, R.C., and R.C. Kellison. 1987. A tree improvement programme for southern hardwoods. pp. 72-76. IN Forest Genetic Resources Information No. 15. FAO, Rome, Italy.

477
Purnell, R.C. 1983. A comparison of breeding strategies for European black alder. Ph.D. dissertation. North Carolina State University, Raleigh. 89 pp.

478
Purnell, R.C., and R.C. Kellison. 1983. A tree improvement program for southern hardwoods. pp. 90-98. IN Proc., 17th Southern Forest Tree Improvement Conference. University of Georgia, Athens.

479
Roeder, K.R., D.T. Tew, and D.J. Frederick. 1987. Accuracy of biomass yield predictions of short rotation *Platanus occidentalis* energy plantations in Alabama. Biomass (in press).

480
Roeder, K.R., D.T. Tew, and D.J. Frederick. 1987. Yield projection accuracy and sampling requirements for short-rotation sycamore energy plantations. Biomass (in press).

481
Roeder, K.R. 1986. Sycamore coppice response to harvest season: Seven year trends. Paper presented at the Fourth Biennial Silvicultural Research Conference, November, 1986, Atlanta, Georgia.

482
Roeder, K.R., and W.E. Gardner. 1984. Growth estimation of mixed southern hardwood stands. Hardwood Research Cooperative Series No. 3. North Carolina State University, School of Forest Resources, Raleigh.

483
Roeder, K.R. 1983. Growth and yield estimation: Development and present status in mixed hardwoods. pp. 61-66. IN Proc., Natural Regeneration Short Course. North Carolina State University, Raleigh.

484
Roeder, K.R., and D.L. Rockwood. 1982. Potential stem biomass and energy content yields of *Eucalyptus grandis* and *E. robusta* in south Florida. Technical Bulletin 831. University of Florida, Gainesville. 6 pp.

485
Schultz, E.B. 1982. Estimation of genetic parameters on half-sib families of sweetgum and sycamore. Ph.D. dissertation. North Carolina State University, School of Forest Resources, Raleigh. 108 pp.

486
Slichter, T.K. 1984. Seasonal variation in nitrogen and phosphorus composition of plantation-grown American sycamore foliage. M.S. thesis. North Carolina State University, Raleigh. 62 pp.

487
Stokes, B.J., D.J. Frederick, and D.T. Curtin. 1986. Field trials of a short-rotation biomass feller buncher and selected harvesting systems. Biomass 11:185-204.

488
Stubblefield, G.W. 1983. Geographic patterns of variation among sweetgum populations in the southern United States. pp. 234-243. IN Proc., 17th Southern Forest Tree Improvement Conference. University of Georgia, Athens.

489
Torreano, S.J., and D.J. Frederick. 1987. Influence of site quality on short rotation hardwood coppice and seedling yields. Biomass (in press).

490
Torreano, S.J. 1986. Biomass, nutrient, and energy content of seedlings and coppice grown under short-rotation intensive culture in the southeastern United States. M.S. thesis. North Carolina State University School of Forest Resources, Raleigh. 71 pp.

491
Torreano, S.J., and D.J. Frederick. 1986. Short-rotation seedling and coppice biomass yields and nutrient content of several tree species in North Carolina. Paper presented at the Southern Silvicultural Research Conference, November 4-6, 1986, Atlanta, Georgia.

492
Torreano, S.J., and D.J. Frederick. 1985. A comparison of coppice and seedling biomass production with time and spacing on two sites in North Carolina. Paper presented at the Third Southern Biomass Energy Research Conference, March 12-14, 1985, University of Florida, Gainesville.

493
Williford, M., R.C. Kellison, D.J. Frederick, and W.E. Gardner. 1979. The use and selection of trees for energy and chemicals. pp. 149-155. IN Proc., 15th Southern Forest Tree Improvement Conference. Mississippi State University, Mississippi State.

494
Woodfin, S., D.J. Frederick, and B. Stokes. 1987. Selected harvesting machines for short rotation intensive culture biomass plantations. Paper presented at the 1987 International Winter Meeting of the American Society of Agricultural Engineers, Chicago.

495
Zobel, B., and R.C. Kellison. 1984. Wood: Where will it come from and where will it go? TAPPI 67(11):33-37.

NORTHERN STATE POWER COMPANY

496
Ostlie, L.D. 1986. A new technology in burning wood for power generation. Internal report. Northern States Power Company, Minneapolis, Minnesota. 5 pp.

497
Ranney, J.W., E.A. Hansen, and D. Ostlie. 1987. Wood-energy plantations and the whole-tree burning concept. Briefings given to U.S. Dept. of Energy and U.S. Forest Service staffs, December 17-18, 1987, Washington, DC.

OAK RIDGE NATIONAL LABORATORY

498
Barron, W.F., R.D. Perlack, P. Kroll, J.H. Cushman, and J.W. Ranney. 1983. FIRSTCUT: A preliminary assessment model for short-rotation intensive silviculture. Model description and user's guide. ORNL/TM-8566. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

499
Cantrell, R.L., and P.A. Layton. 1986. Progeny tests: Site preparation and maintenance using herbicides. pp. 120-167. IN Proc., 17th Annual Spring Symposium, Herbicides for Southern Forestry. Society of American Foresters.

500
Cunningham, M., M.B. Adams, R.J. Luxmoore, W.M. Post, and D.L. DeAngelis. 1988. Quick estimate of root lengths using a video image analyzer. Can. J. For. Res. (in review)

501
Cunningham, M., M.B. Adams, and R.J. Luxmoore. 1987. Length of root samples quickly estimated with a video image analyzer. Poster presentation, American Society of Agronomy Annual Meeting, November 30 - December 3, 1987, Atlanta, Georgia.

502
Cushman, J.H., L.L. Wright, J.L. Trimble, and J.W. Ranney. 1984. Short-rotation intensive culture of hardwoods. pp. 5-14. IN P.F. Bente Jr. (ed.) 1984 International bio-energy directory and handbook. Bio-Energy Council, Washington, DC.

503
Cushman, J.H., L.L. Wright, J.L. Trimble, and J.W. Ranney. 1983. Short rotation intensive culture of hardwoods: Annual progress report for 1982. ORNL-5973. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 128 pp.

504
Cushman, J.H., and J.W. Ranney. 1982. Short rotation growth of hardwoods for energy applications across the United States: Field results and economics. pp. 109-132. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes VI. Institute of Gas Technology, Chicago.

505
Cushman, J.H., and J.W. Ranney. 1982. Short Rotation Woody Crops Program quarterly progress report for the period ending August 31, 1981. ORNL/TM-8157. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 107 pp.

506
Cushman, J.H., and J.W. Ranney. 1982. Short Rotation Woody Crops Program quarterly progress report for the period ending May 31, 1981. ORNL/TM-8156. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 119 pp.

507
Johnson, D.W., and D.E. Todd. 1988. Nitrogen fertilization of young yellow-poplar and loblolly pine plantations at differing frequencies. Soil Science (in press).

508
Johnson, D.W., and D.E. Todd. 1987. Soil available N dynamics following melamine vs urea fertilization in a loblolly pine plantation. Poster presentation, American Society of Agronomy Annual Meeting, November 30 - December 3, 1987, Atlanta, Georgia.

509
Johnson, D.W., and V.H. Dale. 1986. Nitrogen cycling models and their application to forest harvesting. pp. 35. IN R. Evers, E. White, B. Barkley and L. Zsuffa (eds.) Proc., IEA/BA Task II Workshop: Production Technology, Economics and Nutrient Cycling. Report No. 2. International Energy Agency, ENFOR Secretariat, Ottawa, Ontario, Canada.

510
Johnson, D.W., and D.E. Todd. 1984. Nutrient removal by harvesting in mixed oak and loblolly pine. Paper presented at Annual Meeting of the Soil Science Society of America, November 25-30, 1984, Las Vegas, Nevada.

511
Jones, D.W., and J.R. Krummel. 1987. The location theory of the plantation. J. of Regional Science 27(2):157-182.

512
Layton, P.A. 1988. Biotechnology is changing energy crop productivity. pp. 74-75. IN Environmental Sciences Division Annual Progress Report for Period Ending September 30, 1987. ORNL-6441. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

513
Layton, P.A. 1988. Short Rotation Woody Crops Program: Interdisciplinary research in action. Seminar presented to University of Tennessee, Department of Forestry, Wildlife and Fisheries, February 2, 1988, Knoxville, Tennessee.

514
Layton, P.A. 1987. Biotechnology for improving biomass energy crops. Briefing to U.S. Department of Energy, Office of Renewable Technology, February 27, 1987.

515
Layton, P.A. 1987. Biotechnology for improving biomass energy crops. Briefing to U.S. Department of Energy, Biofuels and Municipal Waste Technology Division, March 26, 1987.

516
Layton, P.A. 1987. U.S. biotechnological activities concerning poplars and alders. Paper presented at International Energy Agency Workshop on Biotechnology Development, September 1, 1987, Uppsala, Sweden.

517
Layton, P.A., and L.L. Wright. 1987. Energy crop research advances the fundamentals of forest biology. Paper presented at Southern Forest Biomass Working Group Workshop, June 9, 1987, Biloxi, Mississippi.

518
Layton, P.A., and L.L. Wright. 1987. The role of genetic improvement in the Short Rotation Woody Crops Program. pp. 133-154. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes X. Institute of Gas Technology, Chicago.

519
Layton, P.A. 1986. Short Rotation Woody Crops Program. Management review presentation to the U.S. Department of Energy, Biofuels and Municpal Waste Technology Division, July 29, 1986.

520
Mann, L.K. 1984. Natural regeneration three years after whole-tree and sawlog harvest. Paper presented at Annual Meeting of the Soil Science Society of America, November 25-30, 1984, Las Vegas, Nevada.

521
Norby, R.J. 1987. Physiological aspects of optimum nitrogen nutrition of short-rotation sycamore. Paper presented at Forestry Colloquim, October 8, 1987, University of Illinois, Urbana.

522
Perlack, R.D., and W.A. Geyer. 1987. Wood energy plantation economics in the Great Plains. J. Energy Engineering 13(3):92-101.

523
Perlack, R.D., and J.W. Ranney. 1987. Cost objective overview for short rotation woody crops. Paper presented at International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short Rotation Biomass Systems, August 11-13, 1987, U.S. Forest Service, North Central Forest Experiment Station, Duluth, Minnesota.

524
Perlack, R.D., and J.W. Ranney. 1987. Economics of short-rotation intensive culture for production of wood energy feedstocks. Energy (in press).

525
Perlack, R.D., S. Das, and J.W. Ranney. 1986. The economic evaluation of SRIC energy plantations. pp. 58-61. IN D.L. Rockwood (ed.) Proc., Seventh Southern Forest Biomass Workshop. University of Florida, Gainesville.

526
Perlack, R.D., J.W. Ranney, W.F. Barron, J.H. Cushman, and J.L. Trimble. 1986. Short-rotation intensive culture for the production of energy feedstocks in the U.S.: A review of experimental results and remaining obstacles to commercialization. Biomass 9(2):145-159.

527
Perlack, R.D., J.W. Ranney, and L.L. Wright. 1985. An economic evaluation of the competitiveness of SRIC for energy. pp. 1245-1263. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes IX. Institute of Gas Technology, Chicago.

528
Pimentel, D., and J. Krummel. 1987. Biomass energy and soil erosion: Assessment of resource costs. Biomass 14:15-38.

529
Ranney, J.W., and J.H. Cushman. 1988. Improvement in biomass energy crops makes liquid fuel production more efficient. pp. 72-73. IN Environmental Sciences Division Annual Progress Report for Period Ending September 30, 1987. ORNL-6441. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

530
Ranney, J.W., B.A. Barkley, A.F. Turhollow, and C. Granger. 1987. Short-rotation intensive culture economics for energy in North America. Paper presented at International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short Rotation Biomass Systems, August 11-13, 1987, U.S. Forest Service, North Central Forest Experiment Station, Duluth, Minnesota.

531
Ranney, J.W., and J.H. Cushman. 1987. Plant sciences and biofuels production. Paper presented at the Second Pacific Basin Biofuels Workshop, April 22-24, 1987, Hawaii Natural Energy Institute, University of Hawaii, Lihue, Kuaui, Hawaii.

532
Ranney, J.W., and D.H. Dawson. 1987. Biomass research directions in forestry. Paper presented at the Southern Forest Biomass Working Group Meeting, June 8-11, 1987, Mississippi State University, Mississippi State.

533
Ranney, J.W., E.A. Hansen, and D. Ostlie. 1987. Wood-energy plantations and the whole-tree burning concept. Briefings given to U.S. Dept. of Energy and U.S. Forest Service staffs, December 17-18, 1987, Washington, DC.

534
Ranney, J.W., L.L. Wright, and P.A. Layton. 1987. Hardwood energy crops: The technology of intensive culture. J. of Forestry 85:17-28.

535
Ranney, J.W., L.L. Wright, P.A. Layton, W.A. McNabb, C.R. Wenzel, and D.T. Curtin. 1987. Short Rotation Woody Crops Program: Annual progress report for 1986. ORNL-6348. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 52 pp.

536
Ranney, J.W. 1986. An overview of short-rotation research in the United States and abroad. Paper presented at the 1986 Annual Meeting of the Poplar Council of the United States, July 28-31, 1986, Seattle, Washington.

537
Ranney, J.W. 1986. New technologies in the production of woody crops for energy in the United States. pp. 387-438. IN K.W. Ber (ed.) Advances in solar energy: An annual review of research and development. Vol. III. American Solar Energy Society, Inc., Plenum Press, New York.

538
Ranney, J.W., J.L. Trimble, L.L. Wright, P.A. Layton, R.D. Perlack, C.R. Wenzel, and D.T. Curtin. 1986. Short Rotation Woody Crops Program: Annual progress report for 1985. ORNL-6254. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 79 pp.

539
Ranney, J.W., J.L. Trimble, L.L. Wright, and R.D. Perlack. 1986. Research on short-rotation woody crops in the South. pp. 71-84. IN W. H. Smith (ed.) Biomass Energy Development. Plenum Press, New York.

540
Ranney, J.W. 1985. Research on short-rotation woody crops in the South. Paper presented at the Third Biomass Energy Research Conference, March 12-14, 1985, University of Florida, Gainesville.

541
Ranney, J.W. 1985. Research results of the Short Rotation Woody Crops Program. Paper presented at Symposium on Biomass Energy, April 26, 1985, University of Minnesota, Bioenergy Coordinating Office.

542
Ranney, J.W., R.D. Perlack, J.L. Trimble, and L.L. Wright. 1985. Specialized hardwood crops for energy and fiber: Status, impact, and need. TAPPI 58(12):36-41.

543
Ranney, J.W., L.L. Wright, J.L. Trimble, R.D. Perlack, D.H. Dawson, C.R. Wenzel, and D.T. Curtin. 1985. Short Rotation Woody Crops Program: Annual progress report for 1984. ORNL-6160. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 80 pp.

544
Ranney, J.W., R.D. Perlack, J.L. Trimble, and L.L. Wright. 1984. Can we afford to intensively manage wood for energy: The facts. Paper presented at Third Southern Biomass Energy Research Conference, March 12-14, 1985, Gainesville, Florida.

545
Ranney, J.W., J.L. Trimble, L.L. Wright, J.H. Cushman, and C.R. Wenzel. 1984. Short Rotation Woody Crops Program: Annual progress report for 1983. ORNL-6085. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 91 pp.

546
Ranney, J.W. 1982. Renewable energy in the eighties: Needs for further research, development and demonstration. Testimony presented at hearings before the Subcommittee on Energy Development and Applications, May, 1982.

547
Ranney, J.W., and J.H. Cushman. 1982. Short Rotation Woody Crops Program: Annual progress report for 1981. ORNL/TM-8120. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 65 pp.

548
Ranney, J.W., and J.H. Cushman. 1982. Short-rotation woody crops as a source of energy. pp. 1391-1399. IN R.F. Hill (ed.) Proc., Ninth Energy Technology Conference. Energy Efficiency in the Eighties. Government Institutes, Inc., Rockville, Maryland.

549
Ranney, J.W., and J.L. Trimble. 1982. The Short Rotation Woody Crops Program: 1982 program summary. ORNL-5916. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

550
Ranney, J.W., and J.H. Cushman. 1980. Regional evaluation of woody biomass production for fuels in the Southeast. pp. 109-120. IN Biotechnology and Bioengineering Symposium No. 10. Wiley & Sons, Inc.

551
Ranney, J.W., and J.H. Cushman. 1980. Silvicultural options and constraints in the production of wood energy feedstocks. IN Proc., *Bio-energy '80 Exposition*. BioEnergy Council, Washington, DC.

552
Schutt, J.R., H.H. Shugart Jr., and J.W. Ranney. 1985. Crown geometry of plantation-grown American sycamore and its simulation. ORNL/TM-9721. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 269 pp.

553
Trimble, J.L., R.I. Van Hook, and A.G. Floger. 1985. Biomass for energy: The environmental issues. Biomass 6:3-13.

554
Tschaplinski, T.J., R.J. Norby, D.W. Johnson, and D.E. Todd. 1988. Repeated nitrogen fertilization during the growing season stimulates late-season photosynthesis and growth in short-rotation sycamore plantations. pp. 75-76. IN Environmental Sciences Division Annual Progress Report for Period Ending September 30, 1987. ORNL-6441. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

555
Van Hook, R.I. 1985. Biomass Production. pp. 71-83. IN Environmental Sciences Division Annual Progress Report for the Period Ending September 30, 1984. ORNL-6140. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

556
Van Hook, R.I., D.W. Johnson, D.C. West, and L.K. Mann. 1982. Environmental effects of harvesting forests for energy. Forest Ecol. Manage. 4:79-94.

557
West, D.C. 1984. Nutrient dynamics following whole-tree harvesting. Paper presented at the Annual Meeting of the Soil Science Soceity of America, November 25-30, 1984, Las Vegas, Nevada.

558
West, D.C., H.H. Shugart, and J.W. Ranney. 1981. Population structure of forests over a large area. For. Sci. 27(4):701-710.

559
Wright, L.L. 1988. Short Rotation Woody Crops Program develops a data base on short-rotation forestry. pp. 76-77. IN Environmental Sciences Division Annual Progress Report for Period Ending September 30, 1987. ORNL-6441. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

560
Wright, L.L. 1987. Are increased yields in coppice systems a myth? Paper presented at Energy from Biomass and Wastes XI, March 16-20, 1987, Institute of Gas Technology, Chicago.

561
Wright, L.L., and A.R. Ehrenshaft. 1987. Short Rotation Woody Crops Program technical database key. Unpublished internal report for program participants. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

562
Wright, L.L., P.A. Layton, and J.W. Ranney. 1987. Development of a research strategy for poplar. Paper presented at Annual Meeting of U.S. Poplar Council, June 21-24, 1987, State University of New York, School of Environmental Studies, Syracuse.

563
Wright, L.L., P.A. Layton, and J.W. Ranney. 1987. Plan for *Populus* research in the Short Rotation Woody Crops Program. White paper prepared for U.S. Dept. of Energy.

564
Wright, L.L., and J.W. Ranney. 1987. Validation and standardization of SRIC (short-rotation intensive culture) production costs. Paper presented at International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short Rotation Biomass Systems, August 11-13, 1987, U.S. Forest Service, North Central Forest Experiment Station, Duluth, Minnesota.

565
Wright, L.L. 1986. Maximizing wood energy production in short-rotation plantations: Effect of initial spacing and rotation length. Paper presented at the 1986 Annual Meeting of the Poplar Council of the United States, July 28-31, 1986, Seattle, Washington.

566
Wright, L.L., J.W. Ranney, P.A. Layton, and R.D. Perlack. 1986. Maximizing wood energy production in short-rotation plantations: Effect of initial spacing and rotation length. Paper presented at Environmental Sciences Division Annual Information Meeting, May 7-8, 1986, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

567
Wright, L.L. 1985. Need for standardization in SRIC research. Paper presented at 22nd Annual Meeting of the Poplar Council of the United States, June 1985, Lawrence, Kansas.

568
Wright, L.L., R.D. Perlack, C.R. Wenzel, J.L. Trimble, and J.W. Ranney. 1985. Short Rotation Woody Crops Program quarterly progress report for the period of March 1 to May 31, 1985. ORNL/TM-9698. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 129 pp.

569
Wright, L.L., R.D. Perlack, P.A. Layton, C.R. Wenzel, J.L. Trimble, and J.W. Ranney. 1985. Short Rotation Woody Crops Program: Quarterly progress report for the period June 1 to August 31, 1985. ORNL/TM-9832. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 120 pp.

570
Wright, L.L., J.W. Ranney, J.L. Trimble, R.D. Perlack, and C.R. Wenzel. 1985. Short Rotation Wood Crops Program quarterly progress report for the period September 1 to November 30, 1984. ORNL/TM-9540. Oak Ridge National Laboratory, Oak Ridge, Tennessee.

571
Wright, L.L. 1984. *Populus* research funded by DOE's Short Rotation Woody Crops Program. Paper presented at the 17th International Poplar Commission Meeting, October 1-4, 1984, Ottawa, Canada.

PENNSYLVANIA STATE UNIVERSITY

572
Blankenhorn, P.R., T.W. Bowersox, C.H. Strauss, G.L. Stimely, L.R. Stover, and M.L. DiCola. 1988. Effects of management strategy and site on selected properties of first rotation *Populus* hybrid NE-388. Wood Fiber Sci. 20(1):74-81.

573
Blankenhorn, P.R., T.W. Bowersox, C.H. Strauss, G.L. Stimely, L.R. Stover, and M.L. DiCola. 1988. The effects of management strategy on the physical and chemical properties of *Populus* hybrid clone NE-388. Paper presented at the Forest Products Research Society 40th Meeting, Spokane, Washington.

574
Blankenhorn, P.R., T.W. Bowersox, K.M. Kuklewski, and G.L. Stimely. 1985. Comparison of selected fuel and chemical content values for seven *Populus* hybrid clones. Wood and Fiber Science 17(2):148-158.

575
Blankenhorn, P.R., T.W. Bowersox, K.M. Kuklewski, and G.L. Stimely. 1985. Effects of rotation, site, and clone on the chemical composition of *Populus* hybrids. Wood and Fiber Science 17(3):351-360.

576
Blankenhorn, P.R., T.W. Bowersox, and C.H. Strauss. 1985. Hybrid poplar as an energy source. pp. 2-4. IN The Pennsylvania State University School of Forest Resources annual report of research and extension. Pennsylvania State University, College of Agriculture, School of Forest Resources, University Park.

577
Blankenhorn, P.R., T.W. Bowersox, C.H. Strauss, L.R. Stover, S.C. Grado, G.L. Stimely, M.L. DiCola, C. Hornicsar, and B.E. Lord. 1985. Net energy and economic analyses for producing *Populus* hybrid under four management strategies: first rotation. Unpublished final report to U.S. Dept. of Energy Short Rotation Woody Crops Program. Pennsylvania State University, University Park. 284 pp.

578
Blankenhorn, P.R., T.W. Bowersox, and K.M. Kuklewski. 1984. Variability in energy and chemical values among selected *Populus* parentages grown in short-rotation system. Paper presented at Forest Products Research Society 35th Annual Meeting, June 25-28, 1984, St. Paul, Minnesota.

579
Blankenhorn, P.R., T.W. Bowersox, C.H. Strauss, G.L. Stimely, C.A. Hornicsar, and N.L. DiCola. 1984. The characterization of hybrid poplar as a potential feedstock for fermentation to ethanol. pp. 43-49. IN Proc., 1984 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

580
Blankenhorn, P.R., T.W. Bowersox, K.M. Kuklewski, and G.L. Stimely. 1983. Effects of rotation, site, and clone on the chemical composition of *Populus* hybrids. Paper presented at 37th Annual Meeting of Forest Products Research Society, June, 1983, Norfolk, Virginia.

581
Blankenhorn, P.R., T.W. Bowersox, and K.M. Kuklewski. 1982. Physical and chemical properties of three *Populus* hybrids as influenced by site, parentage, biomass age, and rotation. pp. 393-399. IN Proc., Seventh North American Forest Biology Workshop: Physiology and Genetics of Intensive Culture. University of Kentucky, Lexington.

582
Blankenhorn, P.R., T.W. Bowersox, and R.E. Weyers. 1982. Energy relationships for selected cultural investments. For. Sci. 28(3):459-469.

583
Blankenhorn, P.R., T.W. Bowersox, and K.M. Kuklewski. 1981. Variability in energy and chemical values among selected *Populus parentages grown in short-rotation systems.* Paper presented at 35th Annual Forest Products Research Society Meeting, St. Paul, Minnesota.

584
Blankenhorn, P.R., and R.E. Weyers. 1980. Moisture effects on an energy balance developed for using forest biomass as a fuel. For. Prod. 30(11):41-46.

585
Blankenhorn, P.R., T.W. Bowersox, and W.K. Murphy. 1978. Recoverable energy from the forests: An energy balance sheet. TAPPI 61(4):57-60.

586
Bowersox, T.W., P.R. Blankenhorn, and C.H. Strauss. 1987. Second rotation growth and yield of *Populus* hybrid. Paper presented at the International Energy Agency, Task II-Biomass Growth and Production Technology, Coppice Workshop, August, 1987, Oulu, Finland.

587
Bowersox, T.W., P.R. Blankenhorn, K.D. Oswald, C.H. Strauss, and L.R. Stover. 1984. Cultural investments to increase biomass yields from short rotation systems. Paper presented at Forest Products Research Society 38th Annual Meeting, June 21-25, 1984, St. Paul, Minnesota.

588
Bowersox, T.W., P.R. Blankenhorn, C.H. Strauss, and L.R. Stover. 1984. Irrigation and fertilization increases the biomass yield of dense *Populus* plantations. Paper presented at 17th Session of the International Poplar Commission, October 1-4, 1984, Food and Agriculture Organization, Ottawa, Canada.

589
Bowersox, T.W., L.R. Stover, P.R. Blankenhorn, and C.H. Strauss. 1984. Irrigation and fertilization improves the height and diameter of young *Populus* plantations. Paper presented at 35th Annual Meeting of the Forest Products Research Society, June 25-28, 1984, St. Louis, Missouri.

590
Bowersox, T.W., L.R. Stover, P.R. Blankenhorn, and C.H. Strauss. 1983. Biomass yields from dense plantations. Paper presented at Industrial Wood Energy Forum 83, September. 1983, Forest Products Research Society, Nashville, Tennessee.

591
Bowersox, T.W., P.R. Blankenhorn, C.H. Strauss, and L.R. Stover. 1982. Growth and yield advantages of fertilizers and/or irrigation in dense *Populus* plantations (abstract). IN Proc., Seventh North American Forest Biology Workshop: Physiology of Intensive Culture. University of Kentucky, Lexington.

592
Bowersox, T.W., P.R. Blankenhorn, K.D. Oswald, C.H. Strauss, and L.R. Stover. 1981. Cultural investments in increased biomass yields from short-rotation systems. Paper presented at 35th Annual Forest Products Research Society Annual Meeting, St. Paul, Minnesota.

593
Bowersox, T.W., and P.R. Blankenhorn. 1979. Energy sensitivity and variability analysis of *Populus* hybrid short-rotation plantations in northeastern United States. Unpublished final report to U.S. Dept. of Energy. Pennsylvania State University, University Park. 108 pp.

594
Bowersox, T.W., P.R. Blankenhorn, and W.K. Murphey. 1979. Heat of combustion, ash content, nutrient content, and chemical content of selected *Populus* hybrids. Wood Sci. 11(4):263-267.

595
Gradio, S.C. 1984. An economic analysis of short-rotation *Populus* hybrid plantations under four commercial strategies. M.S. thesis. Pennsylvania State University, University Park. 177 pp.

596
Kerr, S.N., and W.E. Sopper. 1982. Utilization of municipal sludge for woody biomass production in mined land. pp. 313-317. IN Symposium on Surface Mining Hydrology, Sedimentology, and Reclamation. University of Kentucky, Lexington.

597
Labosky, P., T.W. Bowersox, and P.R. Blankenhorn. 1984. Kraft pulp yields obtained from first and second rotations of three hybrid poplar clones. Paper presented at Forest Products Research Society 35th Annual Meeting, June 25-28, 1984, St. Paul, Minnesota.

598
Labosky, P., T.W. Bowersox, and P.R. Blankenhorn. 1983. Kraft pulp yields and paper properties obtained from first and second rotations of three hybrid poplar clones. Wood Fiber Sci. 15(1):81-89.

599
Long, R. 1982. Etiology, symptomology, epidemiology, and disease cycle of *Septoria* canker in *Populus* hybrid plantations. M.S. thesis. Pennsylvania State University, University Park. 51 pp.

600
Long, R., T.W. Bowersox, and W. Merrill. 1986. Artificial inoculation of *Populus* hybrids with *Septoria musiva*. Can. J. For. Res. 16(2):405-407.

601
Long, R., and T.W. Bowersox. 1984. Disease development and incubation period of Septoria canker on *Populus* hybrids. Penn State Res. Briefs 16(2):20-23.

602
Long, R., T.W. Bowersox, and W. Merrill. 1982. Incubation period of Septoria canker and leaf spot on inoculated *Populus* hybrids. Paper presented at Northeast Region Annual Meeting of American Phytopathological Society, November 3-5, 1982, Pennsylvania State University, University Park.

603
Lunden, G.L. 1983. Selected properties and char yield of wood carbonized in a nitrogen atmosphere. M.S. thesis. Pennsylvania State University, University Park. 70 pp.

604
Murphey, W.K., T.W. Bowersox, and P.R. Blankenhorn. 1979. Selected wood properties of young *Populus* hybrids. Wood Sci. 11(4):257-262.

605
Snook, S.K., P. Labosky Jr., T.W. Bowersox, and P.R. Blankenhorn. 1985. Pulp and papermaking properties of hybrid poplar grown under four management strategies and two soil sites. Wood Fiber Sci. 18(1):157-167.

606
Snook, S.K., P. Labosky Jr., T.W. Bowersox, and P.R. Blankenhorn. 1984. Pulp and papermaking properties of hybrid poplar grown under four management strategies. Paper presented at Forest Products Research Society 35th Annual Meeting, June 25-28, 1984, St. Louis, Missouri.

607
Sopper, W.E., and S.N. Kerr. 1980. Potential use of forestland for recycling municipal wastewater and sludge. Paper presented at National Urban Forestry Conference, November 13-16, 1980, Washington, DC.

608
Sopper, W.E., D.R. DeWalle, and S.N. Kerr. 1979. Utilization of municipal wastewater and waste heat for energy production from forest biomass. pp. 572-581. IN Proc., Third National Conference on Technology for Energy Conservation. Information Transfer, Inc., Silver Springs, Maryland.

609
Sopper, W.E., and S.N. Kerr. 1979. Increased woody biomass production and land treatment of wastewater: An economic symbiotic relationship. pp. 118-125. IN Proc., Technology for Energy Conservation. Information Transfer, Inc., Silver Springs, Maryland.

610
Sopper, W.E., and S.N. Kerr. 1979. Maximizing forest biomass energy production by municipal wastewater irrigation. pp. 115-133. IN Proc., Energy from Biomass and Wastes III. Institute of Gas Technology, Chicago.

611
Stimely, G.L., and P.R. Blankenhorn. 1985. Effects of species, specimen size, and heating rate on char yield and fuel properties. Wood Fiber Sci. 17(4):477-489.

612
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1988. A cost analysis of alternate biomass supply systems. For. Prod. 38(1):47-51.

613
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1988. Financial and energy costs of supplying biomass to conversion sites. Applied Biochemistry and Biotechnology 17(3):31-44.

614
Strauss, C.H., S.C. Grado, P.R. Blankenhorn, and T.W. Bowersox. 1988. Second rotation cost evaluations of biomass from short rotation intensive culture *Populus* plantations. pp. 66-84. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes XII. Institute of Gas Technology, Chicago.

615
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1987. Production costs for first rotation biomass plantations. Biomass 12(3):215-226.

616
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1987. Setting standards for the economic analysis of woody biomass: Total cost systems. Paper presented at International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short-Rotation Biomass Energy Systems, August 11-14, 1987, Duluth, Minnesota.

617
Strauss, C.H., S.C. Grado, P.R. Blankenhorn, and T.W. Bowersox. 1987. Microeconomic accounting model for woody biomass systems. Paper presented at the International Energy and U.S. Forest Service Workshop on Economic Evaluations of Short-Rotation Biomass Energy Systems, August 11-13, 1987, Duluth, Minnesota.

618
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1986. Cost analysis of alternate biomass supply systems. pp. 193-199. IN 21st Intersociety Energy Conversion Engineering Conference. Volume 1. American Chemical Society, San Diego, California.

619
Strauss, C.H. 1985. Financial and energy costs of short rotation hardwood plantations. Paper presented at People to People Exchange Forum, China Academy of Forestry, Beijing, Peoples Republic of China.

620
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1984. First rotation financial and energy evaluations of biomass plantations. Paper presented at 17th Session of the International Poplar Commission, October 1-4, 1984, Food and Agriculture Organization, Ottawa, Canada.

621
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1984. First rotation financial and energy evaluations of biomass plantations. Paper presented at National Meeting on Biomass R&D for Energy Applications, October 1-3, 1984, Arlington, Virginia.

622
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1984. Net financial and energy analyses for producing *Populus* hybrid under four management strategies. Paper presented at Energex, the Global Energy Forum '84, Regina, Saskatchewan.

623
Strauss, C.H., P.R. Blankenhorn, T.W. Bowersox, and S.C. Grado. 1984. Net financial and energy analyses for producing *Populus* hybrid under four management strategies. pp. 251-272. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes VIII. Institute of Gas Technology, Chicago.

624
Strauss, C.H., S.C. Grado, P.R. Blankenhorn, and T.W. Bowersox. 1983. Costs of establishing dense plantations for short rotation management systems. Paper presented at Industrial Wood Energy Forum 83, Forest Products Research Society, September. 1983, Nashville, Tennessee.

SEATTLE CITY LIGHT

625
Dolan, L.S. 1982. Biomass: Wood energy. A Seattle City Light Department of Biomass Research Program videotape documentary. Tape No. YC-069. Seattle, Washington.

626
Dolan, L.S., and F. Kropp. 1982. The economics of woody biomass fuels. Paper presented at the International Association of Energy Economists Conference, November 18, 1982, Denver, Colorado.

627
Dolan, L.S., F. Kropp, and G. Sims. 1982. The economics of hardwood fuels produced on biomass plantations. pp. 63-108. IN D.L. Klass (ed.) Proc., Energy from Biomass and Waste VI. Institute of Gas Technology, Chicago.

628
Dolan, L.S., and E. Smith. 1982. Renewable resources with a future. A Seattle City Light Department of Cogeneration-Biomass Energy Information Brochure.

629
Dolan, L.S., and C. Oliver. 1979. Cultural treatment of selected species for woody biomass production. pp. 367-369. IN S. King (ed.) Solar '79. Seattle, Washington.

630
Schiess, P. 1981. Evaluation of the whole tree baler in the Pacific Northwest. Final report to Seattle City Light. University of Washington, College of Forest Resources, Seattle.

631
Seattle City Light. 1981. Today's decisions: Tomorrow's power. Energy Resources Report. Seattle, Washington.

SOUTHERN ILLINOIS UNIVERSITY

632
Anonymous. 1987. Farm-grown energy taking root in Illinois. Biologue Energy Newsletter 4(4):4-5.

633
Ashby, W.C., J.E. Preece, C.A. Huetteman, D.F. Bresnan, and P.L. Roth. 1987. Silver maple tree improvement for biomass production. pp. 6-23. IN Proc., Fifth North Central Forest Tree Improvement Association Conference.

634
Preece, J.E., C.A. Huetteman, C.H. Puello, and M.C. Neuman. 1987. The influence of thidiazuron on *in vitro* culture of woody plants (abstract). HortScience 22(5):259.

TENNESEE VALLEY AUTHORITY

635
Barnett, P.E., and D.L. Sivois. 1985. Roll splitting as an alternative intermediate process for wood fuel. IN Forest Energy Newsletter. Forest Energy Secretariat, SLU, Garpenburg, Sweden.

636
Curtin, D.T., D. Sirois, and J. Sturos. 1987. Roll splitting for field processing of biomass. Paper presented at Harvesting Early Thinnings (HET) Workshop, September 14, 1987, Aberdeen, Scotland.

637
Curtin, D.T. 1986. Bell Model T feller buncher tested in Florida. Biologue:May 1986.

638
Curtin, D.T., and P.E. Barnett. 1986. Development of forest harvesting technology: Application in short-rotation intensive culture (SRIC) woody biomass. TVA/ORNRED/LER-86/7, DOE/OR/21478-1. Tennessee Valley Authority, Muscle Shoals, Alabama.

639
Curtin, D.T. 1985. Findings of plantation harvester test. Paper presented at the American Pulpwood Association Southwide Energy Committee, April 24-25, 1985.

640
Curtin, D.T. 1985. SRIC plantation harvesting test. Video tape presented at the American Pulpwood Association Annual Meeting, March 17-19, 1985.

641
Frederick, D.J., B.J. Stokes, and D.T. Curtin. 1986. Field trials of a Canadian biomass feller-buncher. pp. 17-22. IN Proc., 1985 Southern Forest Biomass Workshop. University of Florida, Gainesville.

642
Stokes, B.J., D.J. Frederick, and D.T. Curtin. 1986. Field trials of a short-rotation biomass feller buncher and selected harvesting systems. Biomass 11:185-204.

643
Woodfin, S., D.J. Frederick, and B. Stokes. 1987. Selected harvesting machines for short rotation intensive culture biomass plantations. Paper presented at the 1987 International Winter Meeting of the American Society of Agricultural Engineers, Chicago.

644
Woodfin, S.L. 1987. Preliminary evaluation of round baler for biomass recovery. Biologue Energy Newsletter 4(2):8-9.

645
Woodfin, S.L., and B.J. Stokes. 1987. Preliminary evaluation of round baler for biomass recovery. Technical release 87-R-8. American Pulpwood Association, Washington, DC.

646
Woodfin, S.L., and B.J. Stokes. 1987. Preliminary evaluation of round baler for biomass recovery. Paper presented at Southern Forest Biomass Workshop, June 11, 1987, Mississippi State University, Mississippi State.

647
Woodfin, S.L., L.L. Wright, and D.T. Curtin. 1987. SRIC: Integration of production and harvesting system costs. Paper presented at International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short-Rotation Biomass Systems, August 11-13, 1987, U.S. Forest Service, North Central Forest Experiment Station, Duluth, Minnesota.

TEXAS A&I UNIVERSITY

648
Cline, G., D. Rhodes, and P. Felker. 1986. Micronutrient, phosphorus and pH influence on growth and leaf tissue nutrient levels of *Prosopis alba* and *Prosopis glandulosa*. For. Ecol. Manage. 16

649
DeSousa, S.M. 1985. Influence of air temperature, light intensity, and photoperiod on rooting of *Prosopis alba* cuttings. Paper presented at Symposium on Establishment and Productivity of Tree Plantings in Semiarid Regions, April 29 May 2, 1985, Texas A&I University, Kingsville.

650
DeSouza, S.M., and P. Felker. 1986. The influence of stock plant fertilization on tissue concentrations of N, P, and carbohydrates and the rooting of *Prosopis alba* cuttings. For. Ecol. Manage. 16:181-190.

651
Felker, P. 1987. Progeny testing nitrogen fixing trees *Prosopis*. Paper presented at Southeastern Forestry Improvement Conference, July 16-18, 1987, College Station, Texas.

652
Felker, P., J. Meyer, and S. Gronski. 1987. Managing mesquite for lumber, cattle and wildlife. Texas A&I University, Kingsville. 7 pp.

653
Felker, P., D. Smith, C. Wiesman, and R.L. Bingham. 1987. Biomass production of *Prosopis alba* at 2 non-irrigated field sites in semiarid south Texas. Unpublished final report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program, Texas A&I University, Kingsville.

654
Felker, P., D. Smith, and C. Wiesmann. 1986. Influence of mechanical and chemical weed control on growth and survival of tree plantings in semiarid regions. For. Ecol. Manage. 16:259-267.

655
Felker, P. 1984. Economic, environmental, and social advantages of intensively managed short rotation mesquite (*Prosopis* spp.) biomass energy farms. Biomass 5:65-77.

656
Felker, P., P.R. Clark, J.F. Osborn, and G.H. Cannell. 1984. *Prosopis* pod production: A comparison of North American, South American, Hawaiian, and African germplasm in young plantations. Econ. Bot. 38(1):36-51.

657
Felker, P., D. Smith, M. Smith, R.L. Bingham, and I. Reyes. 1984. Evaluation of herbicides for use in transplanting *Leucaena leucocephala* and *Prosopis alba* on semi-arid lands without irrigation. For. Sci. 3:747-755.

658
Felker, P. 1983. Legume trees in semiarid and arid areas. Paper presented at Symposium on Nitrogen Fixing Trees for the Tropics, September. 1983, Brazilian Agricultural Research Organization, Rio de Janeiro.

659
Felker, P., G.H. Cannell, P.R. Clark, J.F. Osborn, and P. Nash. 1983. Biomass production of *Prosopis* species (mesquite), *Leucaena* and other leguminous trees grown under heat/drought stress. For. Sci. 19:592-606.

660
Felker, P., G.H. Cannell, J.F. Osborn, P.R. Clark, and P. Nash. 1983. Effects of irrigation on biomass production of 32 *Prosopis* (mesquite) accessions. Exp. Agric. 19:187-198.

661
Felker, P., and S. Roberson. 1983. Mesquite woodworking. Texas A&I University, Caesar Kleberg Wildlife Research Institute, Kingsville, Texas. 35 pp.

662
Felker, P. 1982. Selection of *Prosopis* phenotypes for pod and woodfuels production. Paper presented at First Brazilian Symposium on Algaroba, October 5-7, 1982, Natal, Brazil.

663
Felker, P., G.H. Cannell, P.R. Clark, J.F. Osborn, and P. Nash. 1982. Screening *Prosopis* (mesquite) species for biofuel production on semi-arid lands. Final Report to U.S. Department of Energy. Texas A&I University, Kingsville. 225 pp.

664
Felker, P., and P.R. Clark. 1982. Position of mesquite (*Prosopis* spp.) nodulation and nitrogen fixation (acetylene reduction) in 3-m-long phraetophytically simulated soil columns. Plant Soil 64:297-305.

665
Felker, P., P.R. Clark, J.F. Osborn, and G.H. Cannell. 1982. Biomass estimation in a young stand of mesquite (*Prosopis* spp.), ironwood (*Olneya tesota*), and paloverde (*Cercidium floridum* and *Parkinsonia aculeata*). J. Range Manage. 35:87-89.

666
Felker, P., M.S. Lesney, D. Smith, I. Reyes, and S. Klass. 1982. Overview of mesquite utilization at Texas A&I University. Paper presented at Texas Tech Mesquite Workshop, Lubbock, Texas.

667
Felker, P. 1981. Uses of tree legumes in semi-arid regions. Econ. Bot. 32:174-186.

668
Felker, P. 1981. Vegetative propagation of hard-to-root tree species and associated witchcraft. Paper presented at 1981 Fuels and Chemical from Woody Biomass Annual Contractors meeting, Seattle, Washington.

669
Felker, P., G.H. Cannell, and P.R. Clark. 1981. Variation in growth among 13 *Prosopis* (mesquite) species. Exp. Agric. 17:209-218.

670
Felker, P., and P.R. Clark. 1981. Nodulation and nitrogen fixation (acetylene reduction) in desert ironwood (*Olneya tesota*). Oecologia 48:292-293.

671
Felker, P., and P.R. Clark. 1981. Rooting of mesquite (*Prosopis*) cuttings. J. Range Manage. 34:466-468.

672
Felker, P., P.R. Clark, G.H. Cannell, and J.F. Osborn. 1981. Screening *Prosopis* (mesquite or algarrobo) for biofuel production on semi-arid lands. Paper presented at Symposium on Dynamics and Management of Mediterranean-type Ecosystems, June 22-26, 1981, San Diego, California.

673
Felker, P., P.R. Clark, A.E. Laag, and P.F. Pratt. 1981. Salinity tolerance of the tree legumes mesquite (*Prosopis glandulosa* var. *torreyana*, *P. elutina*, and *P. articulata*), algarrobo (*P. chilensis*), kiawe (*P. pallida*), and tamarugo in nitrogen free media. Plant Soil 61:311-317.

674
Felker, P., P.R. Clark, P. Nash, J.F. Osborn, and G.H. Cannell. 1981. Screening *Prospopis* (mesquite) for cold tolerance. For. Sci. 28:556-562.

675
Felker, P. 1980. Development of low water and nitrogen requiring plant ecosystems to increase and stabilize agricultural production of arid land developing countries. Testimony prepared for Office of Technology Assessment, U.S. Congress, November 23, 1980, Washington, DC.

676
Felker, P., G.H. Cannell, P.R. Clark, and J.R. Osborn. 1980. Screening *Prosopis* (mesquite) for biomass production and nitrogen fixation. Paper presented at International Congress for Study of Semi-Arid and Arid Zones, La Serena, Chile.

677
Felker, P., and P.R. Clark. 1980. Nitrogen fixation (acetylene reduction) and cross inoculation in 12 *Prosopis* (mesquite) species. Plant Soil 57:177-186.

678
Felker, P., P.R. Clark, J.F. Osborn, and G.H. Cannell. 1980. Nitrogen cycling water use efficiency interactions in relation to management of tree legumes (*Prosopis*). Paper presented at Browse in Africa Symposium, Addis Ababa, Ethiopia.

679
Felker, P., P.R. Clark, J.F. Osborn, and G.H. Cannell. 1980. Utilization of mesquite (*Prosopis* spp.) pods for ethanol production. pp. 65-78. IN Tree Crops for Energy Production on Farms. Solar Energy Research Institute, Golden, Colorado.

680
Felker, P. 1979. Mesquite: An all purpose arid land tree. pp. 89-132. IN G.A. Ritchie (ed.) New agricultural crops. American Association for the Advancement of Science Symposium Volume 38. Westview Press, Boulder, Colorado.

681
Glumac, E.L., P. Felker, and I. Reyes. 1987. A comparison of cold tolerance and biomass production in *Leucaena leucocephala*, *L. pulverulenta* and *L. retusa*. For. Ecol. Manage. 18:251-271.

682
Glumac, E.L., P. Felker, and I. Reyes. 1987. Correlations between biomass productivity and soil and plant tissue nutrient concentrations for *Leucaena leucocephala* (K-8) growing on calcareous soils. For. Ecol. Manage. 18:241-250.

683
Hilu, K.W., S. Boyd, and P. Felker. 1982. Morphological diversity and taxonomy of California mesquites (*Prosopis, Leguminosae*). Madrono 29(4):237-254.

684
Klass, S., J. Wright, and P. Felker. 1987. Influence of auxins, thiamine and fungal drenches on the rooting of *Prosopis alba* clone B_2V_{50} cuttings. J. Hortic. Science 62(1):97-100.

685
Klass, S., R.L. Bingham, L. Finker-Templeman, and P. Felker. 1985. Optimizing the environment for rooting cuttings of highly productive clones of *Prosopis alba* (mesquite/algarrobo). J. Hortic. Science 60(2):275-284.

686
Reyes, I. 1983. Evaluation of leucaena forage and biofuel potential in semi-arid south Texas. M.S. thesis. Texas A&I University, Kingsville.

687
Tabone, T.J. 1986. Techniques in the clonal multiplication of *Prosopis alba* clone B_2V_{50} through axillary bud culture. M.S. thesis. Texas A&I University, Kingsville.

688
Tabone, T.J., R.L. Binhan, I. Reyer, and S. Loughrey. 1986. Techniques in the shoot multiplication of the leguminous tree *Prosopis alba* clone B_2V_{50}. For. Ecol. Manage. 16:191-200.

689
Tabone, T.J. 1985. Tissue culture propagation of *Leucaena* and *Prosopis*. Paper presented at Symposium on Establishment and Productivity of Tree Planting in Semiarid Regions, April 29 May. 1985, Texas A&I University, Kingsville.

690
Wightman, S.J. 1987. Effects of soil fertility and foliar fertilization on biomass productivity of *Prosopis* spp. in south Texas. M.S. thesis. Texas A&I University. 140 pp.

U.S. FOREST SERVICE, NORTH CENTRAL FOREST EXPERIMENT STATION

691
Akinyemiju, O.A., and D.I. Dickmann. 1982. Contrasting effects of simazine on the photosynthetic physiology and leaf morphology of two *Populus* clones. Physiol. Plant. 55:402-406.

692
Akinyemiju, O.A., and D.I. Dickmann. 1982. The influence of tillage and the herbicides simazine and diuron on establishing poplar clones in lower Michigan. Nat. Resour. Res. Rep. 426. Michigan State University Agricultural Experiment Station, East Lansing. 12 pp.

693
Akinyemiju, O.A., J.G. Isebrands, N.D. Nelson, and D.I. Dickmann. 1982. Use of glyphosate in the establishment of *Populus* in short rotation intensive culture. pp. 94-102. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

694
Anonymous. 1988. Herbicide-tolerant forest trees via *in vitro* selection. Agricell Report 10(4):27.

695
Bassman, J., W Myers, D.I. Dickmann, and L. Wilson. 1982. Effects of simulated insect damage on early growth of nursery-grown hybrid poplars in northern Wisconsin. Can. J. For. Res. 12(1):1-9.

696
Burk, T.E., N.D. Nelson, and J.G. Isebrands. 1983. Crown architecture of short-rotation, intensively cultured *Populus*. III. A model of first-order branch architecture. Can. J. For. Res. 13:1107-1116.

697
Burk, T.E. 1981. Branch architecture and its relation to growth and yield of young *Populus* clones grown under intensive culture. Ph.D. dissertation. University of Minnesota, St. Paul. 212 pp.

698
Burkot, T.R., and D.M. Benjamin. 1979. The biology and ecology of the cottonwood leaf beetle, *Chrysomela scripta*, on tissue cultured hybrid *Aigeiros* (*Populus* x *euramericana*) subclones in Wisconsin. Can. Entomol. 111:551-556.

699
Burkot, T.R. 1978. The bionomics of the cottonwood leaf beetle on tissue cultured hybrid *Aigeiros* (*Populus* x *euramericana* (Dode) Guinier) subclones. M.S. thesis. University of Wisconsin, Madison. 118 pp.

700
Carlson, P.J., and J.W. Dawson. 1984. Effects of autumn olive and black alder leaf mulches on the growth of eastern cottonwood in two soils. For. Res. Rep. 84-1. University of Illinois, Agricultural Experiment Station, Department of Forestry, Urbana-Champaign. 3 pp.

701
Castello, J.D., and J.G. Berbee. 1978. The detection and elimination of viruses from hybrid poplar clones. Phytopathol. News 12(9):186.

702
Crist, J.B., J.G. Isebrands, and N.D. Nelson. 1979. Suitability of intensively grown *Populus* raw material for industry. Paper presented at 16th Annual Meeting North American Poplar Council, August 14-17, 1979, Thompsonville, Minnesota.

703
Crist, J.B., and B.E. Schlaegel. 1979. Balsam poplar: An American wood. FS-259. U.S. Forest Service, North Central Forest Experiment Station. 4 pp.

704
Crist, J.B., J.G. Isebrands, J.D. Sinkey, and W.L. Bohn. 1978. Thermo-mechanical pulping of three short-rotation intensively cultured species. Paper presented at Annual Meeting Forest Products Research Society, June 25-29, 1978, Atlanta, Georgia.

705
Crow, T.R., J.G. Isebrands, H.M. Rauscher, and R.E. Dickson. 1987. Effects of canopy architecture on photosynthetic production in *Populus* seedings: A simulation study (abstract). pp. 286. IN Proc., 72nd Annual Meeting of Ecological Society of America. Ohio State University, Columbus.

706
Crow, T.R., and H.M. Rauscher. 1986. Silvicultural research: Theory and applications. pp. 334-345. IN Proc., 18th IUFRO World Congress. International Union of Forestry Research Organizations.

707
Crow, T.R., H.M. Rauscher, D.A. Michael, J.G. Isebrands, and D.I. Dickmann. 1986. POPGROW: An ecophysiological growth model (abstract). pp. 30. IN Proc., Conf. Northern Hardwood Resource: Management and Potential. Michigan Technological University, Houghton.

708
Danfield, W., J. Martishus, and E.A. Hansen. 1983. Application date affects herbicide tolerance of hybrid poplars. NC-301. U.S. Forest Service, North Central Forest Experiment Station.

709
Dawson, D.H., J. Zavitkovski, and J.G. Isebrands. 1980. Managing forests for maximum biomass production. AIChE Symp. Ser. 76(195):36-42.

710
Dawson, D.H., and N.V. Noste. 1976. Review of competition control for intensive culture forestry in the North Central region. Iowa State Journal of Research 50(3):271-275.

711
Dawson, D.H. 1975. Are cultural methods available to maximize yields? Iowa State Journal of Research 49:279-281.

712
Dawson, J.O., P.J. Dzialowy, G.Z. Gertner, and E.A. Hansen. 1983. Changes in soil nitrogen concentration around *Alnus glutinosa* in a mixed, short-rotation plantation with hybrid *Populus*. Can. J. For. Res. 13(4):572-576.

713
Dawson, J.O., P.J. Dzialowy, G.Z. Gertner, and E.A. Hansen. 1982. Soil nitrogen patterns around *Alnus glutinosa* in mixed plantation with hybrid *Populus*. pp. 263-270. IN R.N. Mueller (ed.) Proc., 4th Central Hardwood Forest Conference. University of Kentucky, Department of Forestry, Lexington.

714
Dawson, J.O., T.A. White, P.J. Dzialowy, and R.A. Herendeen. 1982. Nitrogen accretion in surficial soil of a young plantation of *Robinia pseudoacacia*. For. Res. Rep. No. 82-7. University of Illinois, Department of Forestry, Urbana.

715
Dawson, J.O., and D.T. Funk. 1981. Seasonal changes in foliar nitrogen concentration of *Alnus glutinosa*. For. Sci. 27(2):239-243.

716
Dawson, J.O., D.T. Funk, R.R. Fitton, and G.Z. Gertner. 1980. Seasonal changes in leaf nitrogen concentration of *Alnus glutinosa*, *A. rugosa*, and *A. serrulta*. pp. 190-201. IN H.E. Garrett and G.S. Cox (eds.) Proc., Central Hardwood Forest Conference III. University of Missouri-Columbia.

717
Dawson, J.O. 1979. Nitrogen-fixing trees and shrubs. Ill. Res. 21(4):8-9.

718
Dickmann, D.I., H. Phipps, and D.A. Netzer. 1980. Cutting diameter influences early survival and growth of several *Populus* clones. NC-261. U.S. Forest Service, North Central Forest Experiment Station. 4 pp.

719
Dickson, R.E. 1987. Diurnal changes in leaf chemical constituents and ^{14}C-partitioning in cottonwood. Tree Physiol. 3:157-171.

720
Dickson, R.E. 1986. Carbon fixation and distribution in young *Populus* trees. pp. 409-426. IN T. Fujimori and D. Whitehead (eds.) Proc., Crown and Canopy Structure in Relation to Productivity. Forestry and Forest Products Research Institute, Ibaraki, Japan.

721
Dickson, R.E. 1986. Carbon relation in trees. Paper presented at IUFRO Workshop on Ecophysiological Techniques, International Union of Forestry Research Organizations, Ithaca, New York.

722
Dickson, R.E. 1986. Microautoradiography of water soluble compounds in plant tissue. Poster presented at IUFRO Workshop on Ecophysiological Techniques, Ithaca, New York.

723
Dickson, R.E. 1985. Diurnal distribution ^{14}C cottonwood changes within the plant and among different chemical fractions. Plant Physiology (Suppl.) 77(4):116.

724
Ek, A.R. 1980. Mensurational and biomass relations for *Populus* 'Tristis #1' under intensive culture. NC-260. U.S. Forest Service, North Central Forest Experiment Station. 4 pp.

725
Ericsson, T. 1982. Propagation of *Salix* through micro-cuttings. Paper presented at the 19th Annual Meeting of the North American Poplar Council, July 20-22, 1982, Rhinelander, Wisconsin.

726
Faltonson, R., D. Thompson, and J. Gordon. 1983. Propagation of poplar clones for controlled-environment studies. NC-81. U.S. Forest Service, North Central Forest and Experiment Station.

727
Fege, A.A., and G.N. Brown. 1984. Carbohydrate distribution in dormant *Populus* shoots and hardwood cuttings. For. Sci. 30(4):999-1010.

728
Fege, A.S., and H. Phipps. 1984. Effect of collection date and storage conditions on field performance of *Populus* hardwood cuttings. Can. J. For. Res. 14:119-123.

729
Ferguson, K.D., D.W. Rose, D.C. Lothner, and J. Zavitkovski. 1981. Hybrid poplar plantations in the Lake States: A financial analysis. J. For. 79(10):664-667.

730
Fillati, J.J., B.E. Haissig, B.H. McCown, L. Comai, and D.E. Riemenschneider. 1987. The development of glyphosate tolerant *Populus* plants through expression of a mutant *aroA* gene from *Salmonella typhimurium*. IN J.W. Hanover and D. Keathley (eds.) Genetic manipulation of woody plants. Plenum Press, New York (in press).

731
Fillatti, J.J., J. Sellmer, B.H. McCown, B.E. Haissig, and L. Comai. 1987. *Agrobacterium* mediated transformation and regeneration of *Populus*. Mol. Gen. Genet. 206:192-199.

732
Fillatti, J.J., B.H. McCown, J. Sellmer, and B.E. Haissig. 1986. The introduction and expression of a gene conferring tolerance to the herbicide glyphosate in *Populus* NC-5339. pp. 83-84. IN Proc., 1986 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

733
Fillatti, J.J., J.C. Sellmer, and B.H. McCown. 1986. Regeneration and transformation of *Populus* tissue (abstract). J. Hortic. Science 21:773.

734
Geimer, R.L., and J.B. Crist. 1980. Structural flakeboard from short-rotation, intensively cultured hybrid poplar clones. For. Prod. 30:42-48.

735
Haissig, B.E. 1987. Forest tree biotechnology: Unique tools to enhance forest productivity. Paper presented at the 14th Session, North American Forestry Commission, October 13-17, 1987, Sault Ste. Marie, Canada.

736
Haissig, B.E. 1987. Tissue culture-based biotechnology for *Populus* clones. pp. 155-176. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes X. Institute of Gas Technology, Chicago.

737
Haissig, B.E., N.D. Nelson, and G.H. Kidd. 1987. Trends in the use of tissue culture in forest improvement. Biotechnology 5:52-59.

738
Haissig, B.E., and D.E. Riemenschneider. 1987. Genetic effects on adventitious rooting. IN T.D. Davis, B.E. Haissig and N. Sankhla (eds.) Adventitious rooting by cuttings. Timber Dioscorides Press (in press).

739
Haissig, B.E. 1986. U.S. Forest Service's view of recent developments and the future of forest biotechnology. Paper presented at the 1986 TAPPI Research and Development Conference, September 18-October, 1986, TAPPI Press, Appleton, Wisconsin.

740
Haissig, B.E., and D.E. Riemenschneider. 1986. Genetic engineering of hybrid poplars for herbicide tolerance. pp. 37-46. IN Proc., Forest Products Research Conference, Matching Utilization Research with the Needs of Timber Managers. U.S. Forest Service, Forest Products Laboratory, Madison, Wisconsin.

741
Hansen, E.A. 1987. Approaches to early testing. Paper presented at IEA Poplar Exchange Meeting, October 15-16, 1987, Ottawa, Canada.

742
Hansen, E.A. 1987. Research strategy for attaining high yielding *Populus* energy plantations. pp. 121-132. IN D.L. Klass (ed.) Proc., Energy from Biomass and Wastes X. Institute of Gas Technology, Chicago.

743
Hansen, E.A. 1987. SRIC yields: A look to the future. Paper presented at the International Energy Agency and U.S. Forest Service Workshop on Economic Evaluations of Short-Rotation Biomass Energy Systems, August 11-13, 1987, U.S. Forest Service, North Central Forest Experiment Station, Duluth, Minnesota.

744
Hansen, E.A. 1987. U.S.A. status report. Paper presented at IEA Poplar Exchange Meeting, October 15-16, 1987, Ottawa, Canada.

745
Hansen, E.A. 1986. Nutrient sources for fast growing forests: principles, practices, and future directions. pp. 67-73. IN Proc., IEA/BA Task II Workshop: Production Technology, Economics and Nutrient Cycling. ENFOR Secretariat, Canadian Forestry Service, Ottawa, Ontario, Canada.

746
Hansen, E.A. 1986. Planting date affects survival and height growth of hybrid poplar. The Forestry Chronicle 62(3):164-169.

747
Hansen, E.A. 1986. Short-rotation energy plantations. Wisconsin State Department of Agriculture Listening Session on Specialty/Alternative Crops for Wisconsin, December 16, 1986, Madison, Wisconsin.

748
Hansen, E.A., and D.A. Netzer. 1986. Hybrid poplar stool spacing: Effects on hardwood cutting production. NC-278. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 5 pp.

749
Hansen, E.A., D.A. Netzer, and R.F. Woods. 1986. Tillage superior to no-till for establishing hybrid poplar plantations. Tree Plant. Notes 37(1):6-10.

750
Hansen, E.A., and H.A.I. Madgwick. 1985. Short-rotation plantation management for coniferous species. pp. 212-229. IN Proc., Research in Forestry for Energy. Intern Stencil nr 37/1985. Swedish University of Agricultural Sciences, Department of Operation Efficiency, Garpenburg, Sweden.

751
Hansen, E.A., and D.A. Netzer. 1985. Weed control using herbicides in short-rotation intensively cultured poplar plantations. NC-260. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 6 pp.

752
Hansen, E.A., and D.N. Tolsted. 1985. Nitrogen sources and fertilizer rates affect growth of hybrid poplar. pp. 71-77. IN J.O. Dawson and K.A. Majerus (eds.) Proc., Fifth Central Hardwood Forest Conference. University of Illinois, Department of Forestry, Urbana-Champaign.

753
Hansen, E.A., and D.A. Netzer. 1984. Geese, grass, and trees. Tree Plant. Notes 35(1):10-11.

754
Hansen, E.A., D.A. Netzer, and W.J. Rietveld. 1984. Site preparation for intensively cultured hybrid poplar plantations. NC-320. U.S. North Central Forest and Experiment Station. 4 pp.

755
Hansen, E.A., D.A. Netzer, and W.J. Rietveld. 1984. Weed control for establishing intensively cultured hybrid poplar plantations. NC-317. U.S. Forest Service, North Central Forest Experiment Station. 6 pp.

756
Hansen, E.A. 1983. Intensive plantation culture: 12 years research. NC-91. U.S. Forest Service, North Central Forest Experiment Station. 155 pp.

757
Hansen, E.A., L. Moore, D.A. Netzer, M. Ostry, H. Phipps, and J. Zavitkovski. 1983. Establishing intensively cultured hybrid poplar plantations for fuel and fiber. NC-78. U.S. Forest Service, North Central Forest Experiment Station.

758
Hansen, E.A., and M.J. Morin. 1983. Short rotation plantation tending: Biological needs and mechanization. pp. 37-42. IN O. Nilsson and L. Zsuffa (eds.) Short rotation forest biomass production technology and mechanization. Internal Rep. No. 229. Swedish University of Agricultural Sciences, Department of Operational Efficiency, Garpenburg, Sweden.

759
Hansen, E.A., and H.M. Phipps. 1983. Effect of soil moisture tension and preplant treatments on early growth of hybrid *Populus* hardwood cuttings. Can. J. For. Res. 13(3):458-464.

760
Hansen, E.A., and J.O. Dawson. 1982. Effects of *Alnus glutinosa* on hybrid *Populus* height growth in a short-rotation intensively cultured plantation. For. Sci. 28(1):49-59.

761
Hansen, E.A. 1981. Root length in young hybrid *Populus* plantations: Its implication for border width of research plots. For. Sci. 27(4):808-814.

762
Hansen, E.A., and H.M. Phipps. 1981. How to grow hybrid poplars. NC-49. U.S. Forest Service, North Central Forest Experiment Station. 6 pp.

763
Hansen, E.A., and D.N. Tolsted. 1981. Effects of cutting diameter and stem or branch position on establishment of a difficult-to-root clone of a *Populus alba* hybrid. Can. J. For. Res. 11(3):723-727.

764
Hansen, E.A., D.H. Dawson, and D.N. Tolsted. 1980. Irrigation of intensively cultured plantations with paper mill effluent. TAPPI 63(11):5.

765
Hansen, E.A., and J.B. Baker. 1979. Biomass and nutrient removal in short rotation intensively cultured plantations. pp. 130-151. IN Proc., Symposium on Impact of Intensive Harvesting on Forest Nutrient Cycling. State University of New York, Syracuse.

766
Hansen, E.A., and R.E. Dickson. 1979. Water and mineral nutrient transfer between root systems of juvenile *Populus*. For. Sci. 25(2):247-252.

767
Hansen, E.A., H.A. McNeel, D.A. Netzer, H.M. Phipps, R.S. Roberts, T.F. Strong, D.N. Tolsted, and J. Zavitkovski. 1979. Short rotation intensive culture practices for northern Wisconsin. Paper presented at 16th Annual Meeting of North American Poplar Council, August 14-17, 1979, Thompsonville, Michigan.

768
Hansen, E.A., H.M. Phipps, and D.N. Tolsted. 1979. Rooting greenwood tip cuttings of a difficult-to-root *Populus* clone. Tree Plant. Notes 30(2):9-11.

769
Hansen, P.H., R.E. McRoberts, J.G. Isebrands, and R.K. Dixon. 1987. Determining CO_2 exchange rate as a function of photosynthetic photon flux density. Photosynthetica 21:98-101.

770
Hanson, P.J., R. McRoberts, J.G. Isebrands, and R. Dixon. 1985. An optimum sampling strategy for measuring CO_2 rates (abstract). Plant Physiology (Suppl.) 77(4):40.

771
Harrell, M.O., D.M. Benjamin, J.G. Berbee, and T.R. Burkot. 1982. Consumption and utilization of leaf tissue-cultured *Populus* x *euramericana* by the cottonwood leaf beetle, *Chrysomela scripta* (Coleoptera: Chrysomelidae). Can. Entomol. 144:743-749.

772
Harrell, M.O., D.M. Benjamin, J.G. Berbee, and T.R. Burkot. 1981. Evaluation of adult cottonwood leaf beetle, *Chrysomela scripta* (Coleoptera: Chrysomelidae), feeding preference for hybrid poplars. Great Lakes Entomol. 14(4):181-184.

773
Harrell, M.O. 1980. The nutritional ecology of the cottonwood leaf beetle as influenced by hybrid clonal foliage, with notes on the insects associated with tissue-cultured hybrid poplars in Wisconsin. Ph.D. dissertation. University of Wisconsin, Madison. 125 pp.

774
Hinckley, T.M., R.F. Stettler, E. Van Volkenburgh, P.J. Schulte, J.G. Isebrands, G. Scarascia, and B. Smit-Spinks. 1987. Growth and productivity of *Populus* spp. and their hybrids: Role of genotype, morphology, and physiology (abstract). pp. 388. IN Proc., 14th International Botanical Congress. Berlin, West Germany.

775
Holt, K.E., H.S. McNabb Jr., M.A. Rothlauf, F.G. Manwiller, and M.E. Ostry. 1981. Characteristics of kraft paper made from *Septoria* cankered *Populus* grown under short-rotation, intensive culture (abstract). Phytopathology 1:226.

776
Hutchinson, J.G. 1981. Fast-growing young poplars make good panels, study says. For. Ind. 1981(4):58-59.

777
Isebrands, J.G., and R. Ceulemans. 1987. Genetic variation in leaf photosynthetic capacity and integrated whole-tree photosynthesis among *Populus* clones in relation to yield (abstract). IN Proc., The Genetics and Physiology of Phtosynthesis and Crop Yield. OECD, Cambridge, UK.

778
Isebrands, J.G. 1986. Carbon allocation studies of poplar trees using radiotracers and extrapolation of controlled environment results to field problems. Paper presented at IUFRO Workshop on Ecophysiological Techniques, Ithaca, New York.

779
Isebrands, J.G. 1986. Production physiology at the whole-tree level (abstract). pp. 2. IN Proc., 1986 Annual Meeting U.S. Poplar Council. University of Washington, Seattle.

780
Isebrands, J.G. 1986. Structure of *Populus* tree crowns. Paper presented at Short Rotation Woody Crops Program Subcontractors' meeting, July 1986, Ames, Iowa.

781
Isebrands, J.G., and D.A. Michael. 1986. Effects of leaf morphology and orientation on solar radiation interception and photosynthesis in *Populus*. pp. 359-381. IN T. Fujimori and D. Whitehead (eds.) Proc., Crown and Canopy Structure in Relation to Productivity. Forestry and Forest Products Research Institute, Ibaraki, Japan.

782
Isebrands, J.G. 1984. Biotechnology applications in forestry: An industrial perspective (abstract). pp. 3. IN Proc., 1984 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

783
Isebrands, J.G., and N.D. Nelson. 1983. Distribution of ^{14}C-labeled photosynthates within intensively cultured *Populus* clones during the establishment year. Physiol. Plant. 59:9-18.

784
Isebrands, J.G. 1982. Toward a physiological basis of intensive culture of poplar. pp. 81-90. IN Proc., 1982 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

785
Isebrands, J.G., D.W. Einspahr, J.E. Phelps, and J.B. Crist. 1982. Kraft pulp and paper properties of juvenile hybrid larch grown under intensive culture. TAPPI 65(9):122-126.

786
Isebrands, J.G., A.R. Ek, and R.S. Meldahl. 1982. Comparison of growth model and harvest yields of short rotation intensively cultured *Populus*: A case study. Can. J. For. Res. 12(1):58-63.

787
Isebrands, J.G., and N.D. Nelson. 1982. Crown architecture of short-rotation, intensively cultured *Populus*. II. Branch morphology and distribution of leaves within the crown of *Populus* 'Tristis' as related to biomass production. Can. J. For. Res. 12(4):853-864.

788
Isebrands, J.G. 1981. Reaction wood anatomy and its effect on kraft paper from short rotation intensively cultured trees (abstract). IAWA Bull. 1(2&3):57-58.

789
Isebrands, J.G., and N.D. Nelson. 1980. Apportionment of ^{14}C-labeled photosynthate within intensively cultured *Populus* trees (abstract). Plant Physiology (Suppl.) 65:211.

790
Isebrands, J.G., and N.D. Nelson. 1979. Distribution of number of leaves and leaf area in short rotation intensive cultured *Populus* 'Tristis'. Paper presented at 5th North American Forest Biology Workshop, March 13-15, 1979, Gainesville, Florida.

791
Isebrands, J.G., and R.A. Parham. 1979. Effects of compression wood on kraft paper from short rotation, intensively cultured jack pine. Paper presented at 33rd Annual Meeting of the Forest Products Research Society, July 8-12, 1979, San Francisco, California.

792
Isebrands, J.G., J.A. Sturos, and J.B. Crist. 1979. Alternatives for the integrated utilization of short rotation intensively cultured *Populus* raw material. pp. 181-187. IN Proc., 1979 TAPPI Annual Meeting. TAPPI Press, Appleton, Wisconsin.

793
Isebrands, J.G., J.A. Sturos, and J.B. Crist. 1979. Integrated utilization of biomass: A case study of short rotation intensively cultured *Populus* raw material. TAPPI 62(7):67-70.

794
Isebrands, J.G., and R.A. Parham. 1978. On the nature of surface dislocations on *Populus* tension wood fibers (abstract). IAWA Bull. 1978(2-3):47.

795
Isebrands, J.G., and R.A. Parham. 1978. On the nature of surface dislocations on *Populus* tension wood fibers (abstract). pp. 34. IN Proc., Plant Science Conference. Misc. Series Publ. #156. Botanical Society of America.

796
Isebrands, J.G. 1977. Short rotation silviculture as an energy source. Paper presented at National Conference Forest Products Utilization Research, October 15-17, 1977, Madison, Wisconsin.

797
Johnson, J.D. 1977. The characterization of the water relations of *Populus* 'Tristis #1' under intensive culture. M.S. thesis. University of Minnesota, St. Paul.

798
Larson, P.R., and R.E. Dickson. 1986. ^{14}C translocation pathways in honeylocust and green ash: Woody plants with complex leaf forms. Physiol. Plant 66:20-31.

799
Lindholm, L. 1979. Evaluation of soil matric potential and dawn leaf water potential as irrigation indices for hybrid *Populus* plantations. M.S. thesis. University of Minnesota, St. Paul. 119 pp.

800
Lothner, D.C., D. Rose, J. Zavitkovski, and K. Ferguson. 1981. A financial analysis of poplar intensive cultures in the Lake States. pp. 145-163. IN D.L. Klass (ed.) Proc., Energy from Biomass and Waste V. Institute of Gas Technology, Chicago.

801
McLaughlin, R.A., E.A. Hansen, and P.E. Pope. 1987. Biomass and nitrogen dynamics in an irrigated hybrid poplar plantation. For. Ecol. Manage. 18:169-188.

802
McLaughlin, R.A., P.E. Pope, and E.A. Hansen. 1985. Nitrogen fertilization and ground cover in a hybrid poplar plantation: Effects on nitrate leaching. J. Environ. Qual. 14(2):241-245.

803
McLaughlin, R.A., P.E. Pope, and E.A. Hansen. 1985. Nitrogen management in a biomass plantation. pp. 77-84. IN G.D. Mroz and C.C. Trettin (eds.) Proc., Forest Soils: A Resource for Intensive Forest Management. 1984 Lake States Forest Soils Conference. Misc. Publication 85-1. Michigan Technological University, School of Forestry and Wood Products, Houghton.

804
McNabb Jr., H.S., R.B. Hall, and M.E. Ostry. 1982. Biological and physical modifications of the environment and the resulting effect upon the host-parasite interactions in short-rotation tree crops. pp. 60-71. IN H.M. Heybroek, B.R. Stephan and K. von Weissenberg (eds.) Proc., Third International Workshop on the Genetics of Host-Parasite Interactions in Forestry: Resistance to Diseases and Pests in Forest Trees. Centre for Agricultural Publishing and Documentation, Wangeningen, the Netherlands.

805
McNabb Jr., H.S., M.E. Ostry, R.S. Sonnelitter, and P.E. Gerstenberger. 1982. The effect and possible integrated management of *Septoria musiva* in intensive, short-rotation culture of *Populus* in the north central states. pp. 51-58. IN E. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

806
McNabb Jr., H.S., M.E. Ostry, P.A. Tipton, R.S. Sonnelitter, J.M. Site, and E.S. Caldbeck. 1981. Fungicidal management of *Septoria* canker of *Populus* grown under short-rotation, intensive culture (abstract). Phytopathology 71:242.

807
McNabb Jr., H.S., R.S. Sonnelitter, and M.E. Ostry. 1981. Leaf and stem disease severity and coppice ability of four *Populus* hybrids. Iowa Acad. Sci. Proc. 2(12):88.

808
Michael, D.A., D.I. Dickmann, K.W. Gottschalk, N.D. Nelson, and J.G. Isebrands. 1985. Determining photosynthesis of tree leaves in the field using a portable $^{14}CO_2$ apparatus: Procedures and problems. Photosynthetica. 19(1):98-108.

809
Michael, D.A., H.M. Rauscher, J.G. Isebrands, T.R. Crow, R.E. Dickson, and D.I. Dickmann. 1985. An ecophysiological growth model of poplar. I. Leaf orientation, light interception, and photosynthate production (abstract). pp. 82-83. IN Proc., Coupling of Carbon, Water, and Nutrient Interactions in Woody Plant Soil Systems. International Symposium on Whole-Plant Physiology. CONF-851050-Absts.

810
Michael, D.A., D.I. Dickmann, and N. Nelson. 1979. Photosynthesis, CO_2 compensation, and stomatal conductance of young poplar plants grown under intensive culture (abstract). Plant Physiology (Suppl.) 63:121.

811
Michler, C.H., and E.O. Bauer. 1988. Somaclonal variants of poplar that tolerate sulfometuron methyl. IN *In vitro* cellular and developmental biology. (in press).

812
Michler, C.H. 1987. Selection of herbicide tolerant poplars. Seminar presented to the Forest Biology group at the Institute of Paper Chemistry, December 18, 1987, TAPPI, Appleton, Wisconsin.

813
Michler, C.H., and E.O. Bauer. 1987. Selection for herbicide tolerance in *Populusto* sulfometuron methyl *in vitro* (abstract). IN Proc., Symposium on Genetic Manipulation of Woody Plants. Michigan State University, East Lansing (in press).

814
Michler, C.H., and E.O. Bauer. 1987. Selection of somaclonal variants for herbicide tolerance in tissue cultured plantlets of *Populus* (abstract). In Vitro 23(3):47A.

815
Michler, C.H., and E.O. Bauer. 1987. Somatic embryogenesis in plant cell cultures of *Populus* (abstract). In Vitro 23(3):46A.

816
Moore, L.M., M.E. Ostry, L.F. Wilson, M.J. Morin, and H.S. McNabb Jr. 1982. Impact of *Septoria* canker caused by *S. musiva* on nursery stock and first-year plantation coppice. pp. 44-50. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

817
Moore, L.M., L.F. Wilson, and M.E. Ostry. 1982. Poplar-and-willow borer injury in two hybrid poplar clones. pp. 59-62. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

818
Myers, G.C., and J.B. Crist. 1986. Feasibility of manufacturing hardboard from short-rotation intensively cultured *Populus*. For. Prod. 36(1):37-44.

819
Nelson, N.D., B.E. Haissig, and D.E. Riemenschneider. 1987. Applying the new somaclonal technology to fiber supply in the pulp and paper industry. BioProcess Eng. (in press).

820
Nelson, N.D. 1985. North Central Forest Experiment Station biotechnology program: Application to tree improvement. pp. 14-22. IN R.C. Schmidtling and M.M. Griggs (eds.) Proc., Eighteenth Southern Forest Tree Improvement Conference. U.S. Forest Service, Southern Forest Experiment Station, Gulfport, Mississippi.

821
Nelson, N.D. 1985. Photosynthetic life span of attached poplar leaves under favorable controlled environmental conditions. For. Sci. 31(3):700-705.

822
Nelson, N.D. 1985. Woody plants are not inherently low in photosynthetic capacity. Photosynthetica 18(4):600-605.

823
Nelson, N.D., and B.E. Haissig. 1984. Biotechnology in the Forest Service's North Central Forest Experiment Station. IN Proc., Recent Advances in Forest Biotechnology Symposium.

824
Nelson, N.D., B.E. Haissig, and D.E. Riemenschneider. 1984. Applying the new somaclonal technology to forestry. IN Proc., 1984 TAPPI Research and Development Conference. TAPPI Press, Appleton, Wisconsin.

825
Nelson, N.D., J.A. Sturos, P.R. Fritshcel, and L.D. Satter. 1984. Ruminant feedstuff from the commercial foliage of hybrid poplars grown under intensive culture. For. Prod. 34(4):37-44.

826
Nelson, N.D., and J.G. Isebrands. 1983. Late-season photosynthesis and photosynthate distribution in an intensively-cultured *Populus nigra* x *laurifolia* clone. Photosynthetica 17(4):537-549.

827
Nelson, N.D., T. Burk, and J.G. Isebrands. 1981. Crown architecture of short-rotation intensively cultured *Populus*. I. Effects of clone and spacing on first-order branch characteristics. Can. J. For. Res. 11(1):73-81.

828
Nelson, N.D., and P. Ehlers. 1981. Comparative photosynthesis within two poplar clones grown in growth room, greenhouse, and field (abstract). Plant Physiology (Suppl.) 65(4):93.

829
Nelson, N.D., T. Burk, J.G. Isebrands, and A.R. Ek. 1980. Clone and spacing effects on branch characteristics of short-rotation intensively cultured *Populus*. Paper presented at First North Central Tree Improvement Conference, August 21-23, 1980, Madison, Wisconsin.

830
Nelson, N.D., J.G. Isebrands, and W.J. Rietveld. 1979. Ethylene diffusion through a salt solution and different rubber materials (abstract). Plant Physiology (Suppl.) 63:93.

831
Nelson, N.D., and W.E. Hillis. 1978. Association between altitude and xylem levels in *Eucalyptus pauciflora*. Aust. For. Res. 8:75-81.

832
Nelson, N.D., and W.E. Hillis. 1978. Ethylene and tension wood formation in *Eucalyptus gomphocephala*. Wood Sci. Technol. 12:309-315.

833
Nelson, N.D., and W.E. Hillis. 1978. Genetic and biochemical aspects of kino vein formation in *Eucalyptus*. II. Hormonal influences on kino formation in *E. regnans*. Aust. For. Res. 8:83-91.

834
Nelson, N.D., J.G. Isebrands, and W.E. Hillis. 1978. Some effects of ethylene on the morphology and anatomy of *Eucalyptus* and *Populus* seedlings (abstract). Int. Assoc. Wood Anat. Bull. 1978/2-3:48.

835
Netzer, D.A. 1986. Effect of spring-applied sulfometuron and imazapyr on newly planted tree seedlings in northern Wisconsin. pp. 115-117. IN Proc., North Central Weed Control Conference, Volume 41. Milwaukee, Wisconsin.

836
Netzer, D.A., and E.A. Hansen. 1986. Integrated pest management in intensive forestry. pp. 98-108. IN Proc., Integrated Pest Management Symposium for Northern Forests.

837
Netzer, D.A. 1984. Herbicide trials on European larch in northern Wisconsin. NC-318. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.

838
Netzer, D.A. 1984. Hybrid poplar plantations outgrow deer browsing effects. NC-325. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.

839
Netzer, D.A., and E.A. Hansen. 1983. Controlling weeds in poplars by dormant season glyphosate overspray. pp. 141-142. IN Proc., North Central Weed Control Conference. Iowa State University, Ames.

840
Noste, N., and H. Phipps. 1978. Herbicide and container system effects in survival and early growth of conifers in northern Wisconsin. For. Chron. 54(4):209-212.

841
Ostry, M.E., and H.S. McNabb Jr. 1982. Preventing blackstem damage to *Populus* hardwood cuttings. pp. 36-43. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

842
Ostry, M.E. 1981. Important diseases of intensively grown poplars in the north central region (abstract). Phytopathology 71:247.

843
Ostry, M.E. 1980. How to identify *Septotinia* and *Phyllosticta* leaf spots of poplars. U. S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 5 pp.

844
Ostry, M.E. 1980. How to identify shoot blight of poplars. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 5 pp.

845
Ostry, M.E. 1979. Disease research of poplars grown under intensive culture in the north central region of the United States. pp. 83-91. IN Proc., 16th Annual Meeting of the North American Poplar Council.

846
Pallardy, S.G., and T.T. Kozlowski. 1981. Water relations of *Populus* clones. Ecology 62(1):159-169.

847
Pallardy, S.G., and T.T. Kozlowski. 1980. Cuticle development in the stomatal region of *Populus* clones. New Phytol. 85:363-368.

848
Pallardy, S.G., and T.T. Kozlowski. 1979. Early root and shoot growth of *Populus* clones. Silvae Genet. 28(4):153-156.

849
Pallardy, S.G., and T.T. Kozlowski. 1979. Frequency and length of stomata of 21 *Populus* clones. Can. J. Bot. 57:2519-2523.

850
Pallardy, S.G., and T.T. Kozlowski. 1979. Relationships of leaf diffusion resistance of *Populus* clones to leaf water potential and environment. Ecologia 40:371-380.

851
Pallardy, S.G., and T.T. Kozlowski. 1979. Stomatal response of *Populus* clones to light intensity and vapor pressure deficit. Plant Physiology (Suppl.) 64:112-114.

852
Pallardy, S.G. 1978. Water relations of selected *Populus* clones. Ph.D. dissertation. University of Wisconsin, Madison. 302 pp.

853
Palmer, M.A., M.E. Ostry, and A.L. Schipper. 1980. How to identify and control *Marssonia* leaf spot and canker of poplars. U. S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 5 pp.

854
Palmer, M.A., and A.L. Schipper Jr. 1979. Resistance of poplars to *Septoria* canker resistance (abstract). Phytopathology 69(9):1041.

855
Parham, R.A., K.W. Robinson, and J.G. Isebrands. 1977. Effects of tension wood on kraft paper from a short rotation hardwood (*Populus tristis* #1). Wood Sci. Technol. 11:291-303.

856
Phelps, J.E., J.G. Isebrands, and R.M. Teclaw. 1987. Raw material quality of short-rotation. II. Wood and bark from first rotation stems and stems grown from coppice. IAWA Bulletin 8:182-186.

857
Phelps, J.E., J.G. Isebrands, D.W. Einspahr, J.B. Crist, and J.A. Sturos. 1985. Wood and paper properties of vacuum airlift segregated juvenile poplar whole-tree chips. Wood and Fiber Science 17(4):529-539.

858
Phelps, J.E., J.G. Isebrands, and R.M. Teclaw. 1983. Raw material evaluations of short rotation intensively cultured *Populus* coppice (abstract). pp. 46. IN Abstracts of the International Union of Forestry Research Organizations Division 5 Conference.

859
Phelps, J.R., D.W. Einspahr, J.G. Isebrands, and J.B. Crist. 1981. Short rotation intensively cultured hybrid larch as a potential source of kraft pulp. Paper presented at the Forest Products Research Society 35th Annual Meeting, June 21-25, 1981, St. Paul, Minnesota.

860
Phipps, H.M., E.A. Hansen, and A.S. Fege. 1983. Pre-plant soaking of dormant *Populus* hardwood cuttings. NC-241. U.S. Forest Service, North Central Forest and Experiment Station. 8 pp.

861
Phipps, H., and D.A. Netzer. 1981. The influence of collection time and storage temperature on *Populus* hardwood cutting development. Tree Plant. Notes 32(4):33-36.

862
Phipps, H.M. 1981. Increasing the production of greenwood cutting material of *Populus* hybrids with the cytokinin, ACCEL. Plant Propag. 27(4):8-10.

863
Phipps, H.M., E.A. Hansen, and D.M. Tolsted. 1980. Rooting greenwood tip cuttings of several *Populus* clones hydroponically (hydroponic rooting of *Populus* cuttings). Can. J. For. Res. 10:107-110.

864
Phipps, H.M. 1978. Rooting *Populus* cuttings in various media bound with a liquid polymer. Plant Propag. 24(2):11-13.

865
Phipps, H.M., D. Belton, and D.A. Netzer. 1977. Propagating cuttings of some *Populus* clones for tree plantations. Plant Propag. 23(4):8-11.

866
Radcliffe, R.C., E.D. Matson, and J.A. Mattson. 1981. Tree-planting interval indicator. Tree Plant. Notes 32(4):13-14.

867
Ranney, J.W., E.A. Hansen, and D. Ostlie. 1987. Wood-energy plantations and the whole-tree burning concept. Briefings given to U.S. Dept. of Energy and U.S. Forest Service staffs, December 17-18, 1987, Washington, DC.

868
Rauscher, H.M., D.A. Michael, J.G. Isebrands, D. Dickson, T.R. Crow, and D.I. Dickmann. 1986. Exploring the growth of a poplar seedling as influenced by genetics and climate. pp. 738. IN H.V. Wiant, D.O. Yandle and W.E. Kidd (eds.) Proc., Forestry Microcomputer Software Symposium. West Virginia University, College of Agriculture and Forestry, Morgantown.

869
Rawanski, J.J., J.A. Bowles, and N.A. Noste. 1980. Soil properties relate to conifer seedling height growth in northern Wisconsin. NC-254. U.S. Forest Service, North Central Forest Experiment Station. 3 pp.

870
Riemenschneider, D.E., B.E. Haissig, and E.T. Bingham. 1988. Integrating biotechnology and conventional breeding in plant breeding programs. IN J.W. Hanover and D. Keathley (eds.) Genetic manipulation of woody plants. Plenum Press, New York (in press).

871
Riemenschneider, D.E. 1986. Integrating conventional breeding and biotechnology. Paper presented at 30th Northeastern Forest Tree Improvement Conference, July 22-24, 1986, University of Maine at Orono, Orono.

872
Riemenschneider, D.E. 1986. Methods for obtaining novel sources of genetic variation. Paper presented at the Short Rotation Woody Crops Subcontractors' Meeting, August 12-14, 1986, Ames, Iowa.

873
Rietveld, W.J., and R.W. Tinus. 1987. A simple method for evaluating whole-plant cold hardiness. Tree Plant. Notes 38(2):16-18.

874
Rietveld, W.J., R.C. Schlesinger, and K.J. Kessler. 1983. Allelopathic effects of black walnut on European black alder coplanted as a nurse species. J. Chem. Ecol. 9(8):1119-1133.

875
Roberts, P.S., and J. Zavitkvoski. 1980. Growth of hybrid poplars, white spruce, and jack pine under various artificial lights. NC-206. U.S. Forest Service, North Central Forest Experiment Station. 5 pp.

876
Rose, D., K. Ferguson, D.C. Lothner, and J. Zavitkovski. 1981. An economic and energy analysis of poplar intensive cultures in the Lake States. NC-196. U.S. Forest Service, North Central Forest Experiment Station. 44 pp.

877
Rose, D., B. Walker, K. Ferguson, and D.C. Lothner. 1981. A comparison of the energy efficiency of intensive and extensive hybrid poplar production systems. pp. 53-70. IN D.L. Klass and G.H. Emert (eds.) Fuels from Biomass and Waste, Vol. 3. Ann Arbor Science, Ann Arbor, Michigan.

878
Russell, J.A., and B.H. McCown. 1986. Culture and regeneration of *Populus* leaf protoplasts isolated from nonseedling tissue. Plant Sci. 46:133-142.

879
Russell, J.A., and B.H. McCown. 1986. Techniques for enhanced release of leaf protoplasts in *Populus*. Plant Cell Repts. 5:284-287.

880
Sarkanen, K.V., and D.A. Tillman. 1980. Progress in biomass conversion. Volume 2. Academic Press, New York. 216 pp.

881
Scarascia-Mugnozza, G., J.G. Isebrands, T.M. Hinckley, and R.F. Stettler. 1987. Patterns of assimilate allocation and relative contributions of the portions of the crown in four poplar (*Populus*) clones (abstract). pp. 441. IN Proc., 14th International Botanical Congress. Berlin, West Germany.

882
Schipper Jr., A.L., and A. Palmer. 1979. Distribution of *Septotinia* leaf spot of poplars in the north central United States (abstract). Phytopathology 69(9):1044.

883
Schipper Jr., A.L., H.S. McNabb, and W.F. Haywood. 1977. *Dothichiza* and *Phomopsis* cankers of hybrid poplar in Iowa (abstract). Proc. Am. Phytopathol. Soc. 4:109-110.

884
Sellmer, J.C., B.H. McCown, and B.E. Haissig. 1986. A selection system for recovery of transformed shoots regenerated from *Populus* leaf tissue (abstract). pp. 154. IN Proc., University of Minnesota. Minneapolis.

885
Stomp, A.M., R.R. Sederoff, and J.G. Isebrands. 1987. Report on forest biotechnology: Current status and future directions (abstract). Paper presented at the. 1987 TAPPI Pulping Conference, November 2-4, 1987, TAPPI Press, Washington, DC.

886
Strong, T.F. 1986. Nongame breeding bird activity in an intensively cultured *Populus* plantation. Paper presented at Poplar Council of the United States Meeting, July. 1986, Seattle, Washington.

887
Strong, T.F. 1986. Spacing-yield relationships of three *Populus* clones with and without irrigation. Paper presented at Poplar Council of the United States Meeting, July. 1986, Seattle, Washington.

888
Strong, T.F., and J. Zavitkovski. 1982. Harvesting season affects regeneration and growth of *Populus* 'Tristis #1' coppice. pp. 94-102. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

889
Strong, T.F. 1980. Energy values of nine *Populus* clones. NC-257. U.S. Forest Service, North Central Forest Experiment Station. 3 pp.

890
Strong, T.F., and J. Zavitkovski. 1978. Morphology of jack pine and tamarack needles. NC-153. U.S. Forest Service, North Central Forest Experiment Station. 6 pp.

891
Sucoff, E., and D. Hiesey. 1978. Preliminary evaluation of leaf water potential for irrigating hybrid poplar. Sci. J. Ser. Pap. No. 10264. University of Minnesota, St. Paul.

892
U.S. Forest Service. 1983. Methods of rapid, early selection of poplar clones for maximum yield potential: A manual of procedures. NC-81. U.S. Forest Service, North Central Forest Experiment Station. 49 pp.

893
U.S. Forest Service. 1980. Energy and wood from intensively cultured plantations: Research and development program. NC-58. U.S. Forest Service, North Central Forest Experiment Station. 28 pp.

894
Verch, R.L. 1986. Nongame breeding bird activity in an intensively cultured *Populus* plantation. NC-336. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 6 pp.

895
Widen, K.D., and A.L. Schipper Jr. 1981. Effect of *Melampsora medusae* leaf rust infection on yield of hybrid poplars in the north central United States. Eur. J. For. Pathol. 11(7):438-448.

896
Widen, K.D., and A.L. Schipper Jr. 1980. Epidemiology of *Melampsora medusae* leaf rust of poplars in the north central United States. Can. J. For. Res. 10(3):257-263.

897
Widen, K.D., and A.L. Schipper Jr. 1978. Infection of larix species by *Melampsora medusae*. Phytopathol. News 12(9):168.

898
Wilson, L.F., and M.E. Ostry. 1980. How to identify and prevent injury by the poplar-gall *Saperda*. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota. 5 pp.

899
Woods, R.F., L.M. Moore, L.F. Wilson, M.E. Ostry, and D.I. Dickmann. 1982. Performance of 3-year-old hybrid poplar clones in relation to soil texture, natural soil drainage, and pest incidence. pp. 74-83. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

900
Young, K.R., H.S. McNabb Jr., and M.E. Ostry. 1980. Aerial pathogens in a central Iowa poplar plantation (abstract). Iowa Acad. Sci. Proc. 87(1):Centerfold 6.

901
Zarges, R.V., R.D. Newman, and J.B. Crist. 1980. Kraft pulp and paper properties of *Populus* clones grown under short rotation intensive culture. TAPPI 63:91-94.

902
Zavitkovski, J., and T.F. Strong. 1984. Biomass production of 12-year-old intensively cultured *Larix eurolepis*. NC-321. U.S. Forest Service, North Central Forest Experiment Station, St. Paul, Minnesota.

903
Zavitkovski, J., and J.G. Isebrands. 1983. Biomass production and energy accumulation in the world's forests. pp. 12-22. IN Proc., Seventh International FPRS Industrial Wood Energy Forum '83, Volume I. Forest Products Research Society.

904
Zavitkovski, J., A.L. Lundgren, and T.F. Strong. 1983. Biomass production of four- to nine-year-old intensively cultured *Larix eurolepis* growth in 'Scotch Plaid' plots in Wisconsin. NC-231. U.S. Forest Service, North Central Forest and Experiment Station.

905
Zavitkovski, J. 1982. Characterization of light climate under canopies of intensively cultured hybrid poplar plantations. Agric. Meteorol. 25:245-255.

906
Zavitkovski, J. 1982. Juvenile coppice growth and production of several hybrid poplars in northern Wisconsin. pp. 103-112. IN J. Zavitkovski and E.A. Hansen (eds.) Proc., 1982 North American Poplar Council Meeting. Kansas State University, Manhattan.

907
Zavitkovski, J., and T.F. Strong. 1982. How to grow and use hybrid poplar firewood. Pamphlet HT-54. U.S. Forest Service, North Central Forest and Experiment Station.

908
Zavitkovski, J. 1981. Small plots with unplanted plot border can distort data in biomass production studies. Can. J. For. Res. 11(1):9-12.

909
Zavitkovski, J. 1981. Some promising forest ecosystems of the temperate zone for biomass production and energy storage. pp. 129-143. IN Proc., Energy from Biomass and Waste V. Institute of Gas Technology, Chicago.

910
Zavitkovski, J. 1981. Structure and seasonal distribution of litterfall in young plantations of *Populus* 'Tristis #1'. Plant Soil 60:409-422.

911
Zavitkovski, J., R.M. Jeffers, H. Nienstaedt, and T.F. Strong. 1981. Biomass production of several jack pine provenances at three Lake States locations. Can. J. For. Res. 11:441-447.

912
Zavitkovski, J. 1980. SRIC plantations for biomass and energy production. Paper presented at the meeting of the International Energy Agency, March 11-13, 1980, Rhinelander, Wisconsin.

913
Zavitkovski, J. 1979. Energy production in irrigated, intensively cultured plantations of *Populus* 'Tristis #1' and jack pine. For. Sci. 25(3):383-392.

914
Zavitkovski, J., E.A. Hansen, and H.A. McNeel. 1979. Nitrogen-fixing species in short rotation systems for fiber and energy production. pp. 388-402. IN J.C. Gordon, C. T. Wheeler and D. A. Perry (eds.) Symbiotic nitrogen fixation in the management of temperate forests. Oregon State University, Forestry Research Laboratory, Corvallis.

915
Zavitkovski, J., and D.H. Dawson. 1978. Intensively cultured plantations. Structure and biomass production of 1- to 7-year-old intensively cultured tamarack plantations in Wisconsin. TAPPI 61(6):68-70.

916
Zavitkovski, J., and D.H. Dawson. 1978. Structure and biomass production of 1- to 7-year-old intensively cultured tamarack plantations in Wisconsin. NC-157. U.S. Forest Service, North Central Forest and Experiment Station. 15 pp.

U.S. FOREST SERVICE, PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION

917
Ager, A. 1982. Some aspects of reproductive biology in alders as they pertain to potential breeding programs (abstract no. 10). Paper presented at the Western Forest Genetics Association Meeting, Corvallis, Oregon.

918
Brown, S. 1982. Natural reproductive biology of red alder as studied in populations of three elevational transects (abstract no. 11). Paper presented at the Western Forest Genetics Association Meeting, Corvallis, Oregon.

919
DeBell, D.S. 1988. Activities related to poplar and willow cultivation, exploitation, and utilization: 1984-1987. Paper presented as a representative of the National Poplar Commission of the United States at the 18th Session of the International Poplar Commission, September. 1988, Beijing, China.

920
DeBell, D.S., W.R. Harms, and J.C. Zasada. 1988. Yield of *Populus* hybrids in 'woodgrass' and other short-rotation density regimes. Paper presented at Energy from Biomass and Wastes XII, February 15-19, 1988, Institute of Gas Technology, Chicago.

921
DeBell, D.S., and C.D. Whitesell. 1987. Diameter-density relationships and spacing considerations for young *Eucalyptus saligna* plantations in Hawaii. Australian Forestry (in press).

922
DeBell, D.S., C.D. Whitesell, and T.B. Crabb. 1987. Benefits of *Eucalyptus-alibizia* mixtures vary by site on Hawaii island. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 5 pp.

923
DeBell, D.S., C.D. Whitesell, and T.B. Crabb. 1987. Benefits of *Eucalyptus-alibizia* mixtures vary by site on Hawaii island. Australia Forestry (in press).

924
DeBell, D., and C.D. Whitsell. 1986. Admixing *Albizia* to supply nitrogen for *Eucalyptus* plantations in Hawaii. pp. 209. IN Proc., IEA/BA Task II Workshop: Production Technology, Economics and Nutrient Cycling. ENFOR Secretariat, Ottawa, Ontario, Canada.

925
DeBell, D.S., C.D. Whitesell, and T.H. Schubert. 1985. Mixed plantations of *Eucalyptus* and leguminous trees enhance biomass production. PSW-175. U.S. Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. 6 pp.

926
DeBell, D.S. 1984. Red alder: Biological information for silvicultural decisions. Paper presented at Hardwood Management and Utilization Workshop, October 30-November 1, 1984, Oregon State University, Corvallis.

927
Debell, D.S. 1984. Stand structure and development in a 7-year-old red alder planted at 5 spacings (abstract). IN Proc., 57th Annual Meeting of the Northwest Scientific Association. Missoula, Montana.

928
DeBell, D.S., and M.A. Radwan. 1984. Foliar chemical concentrations in red alder stands of various ages. Plant Soil 77:391-394.

929
DeBell, D.S., and M.A. Radwan. 1984. Repeated coppicing of cottonwood and alder affects soil properties (abstract). Agron. Abstr. 1984:258.

930
DeBell, D.S., M.A. Radwan, C.A. Harrington, and D.L. Reukema. 1984. Culture of red alder (*Alnus rubra*) in biomass plantations. BioEnergy (in press).

931
DeBell, D.S., M.A. Radwan, C.A. Harrington, and D.L. Reukema. 1984. Culture of red alder in biomass plantations. pp. 125-134. IN Proc., Energy from Biomass: Building on a Generic Technology Base. Second Technical Review Meeting. Argonne National Laboratory, Argonne, Illinois.

932
DeBell, D.S., M.A. Radwan, and J.M. Kraft. 1983. Influence of red alder on chemical properties of a clay loam soil in western Washington. PNW-313. U.S. Forest Service, Pacific Northwest Forest and Experiment Station. 7 pp.

933
DeBell, D.S., and T.C. Turpin. 1983. Red alder. pp. 26-28, 191. IN R.M. Burns (ed.) Silvicultural systems for the major forest types of the United States. Agricultural Handbook No. 445. U.S. Forest Service, Washington, DC.

934
Harrington, C.A. 1986. A method of site quality evaluation for red alder. PNW-192. U.S. Forest Service, Pacific Northwest Research Station.

935
Harrington, C.A., and R.O. Curtis. 1986. Height, growth and site index curves for red alder. PNW-358. U.S. Forest Service, Pacific Northwest Research Station.

936
Harrington, C.A. 1984. Factors influencing initial sprouting of red alder. Can. J. For. Res. 14:191-197.

937
Harrington, C.A. 1984. Site quality prediction for red alder (abstract). Agron. Abstr. 1984:260.

938
Harrington, C.A. 1983. Silviculture of western hardwoods. pp. 28-32. IN Proc., 1982 Convention of the Society of American Foresters. SAF Publ. 83-04. Society of American Foresters, Bethesda, Maryland.

939
Harrington, C.A., and D.S. DeBell. 1983. Effects of irrigation, pulp mill sludge, and repeated coppicing on growth and yield of black cottonwood and red alder. Can. J. For. Res. 14(6):844-849.

940
Heeber, C.F., and M.J. Bergener. 1983. Red alder: A bibliography with abstracts. PNW-161. U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

941
Hellman, P.E., and R.F. Stettler. 1983. Phytomass production in young mixed plantations of *Alnus rubra* (Bong.) and cottonwood in western Washington. Can. J. Microbiol. 19(8):1007-1013.

942
Hook, D.D., M.D. Murray, D.S. DeBell, and B.C. Wilson. 1987. Variation in growth of red alder families in relation to shallow water table levels. For. Sci. 33(1):224-229.

943
Peeler, K.C., and D.S. DeBell. 1987. Variation in damage from growing-season frosts among open-pollinated families of red alder. PNW-RN-454. U.S. Forest Service, Pacific Northwest Research Station, Olympia, Washington. 8 pp.

944
Radwan, M.A., and D.S. DeBell. 1988. Nutrient relations in coppiced black cottonwood and red alder. Plant and Soil (in press).

945
Radwan, M.A. 1987. Effects of fertilization on growth and foliar nutrients of red alder seedlings. PNW-RP-375. U.S. Forest Service, Pacific Northwest Research Station, Portland, Oregon. 14 pp.

946
Radwan, M.A., D.S. DeBell, and J.M. Kraft. 1987. Chemical properties of forest floor and mineral soil beneath red alder stands in Western Washington. Can. J. For. Res. (in press).

947
Radwan, M.A., J.M. Kraft, and D.S. DeBell. 1987. Bud characteristics of unrooted stem cuttings affect establishment success of cottonwood. PNW-RN-461. U.S. Forest Service, Pacific Northwest Research Station, Olympia, Washington. 8 pp.

948
Radwan, M.A., D.D Hook, and D.W. Johnson. 1986. Vegetative propagation of red alder (*Alnus rubra*) (abstract). pp. 66. IN Abstracts of 59th Annual Meeting of the Northwest Scientific Association.

949
Radwan, M.A., C.A. Harrington, and J.M. Kraft. 1984. Litterfall and nutrient returns in red alder stands in western Washington. Plant and Soil 79(3):343-352.

950
Radwan, M.A., and J.S. Shumway. 1984. Effect of forest floor on growth of Douglas-fir, western hemlock, and red alder seedlings (abstract no. 87). Paper presented at 57th Annual Meeting of the Northwest Scientific Association, Missoula, Montana.

951
Radwan, M.A., and D.S. DeBell. 1982. Soil chemical properties as affected by age of red alder stands (abstract no. 101). Paper presented at 55th Annual Meeting of the Northwest Scientific Association, March 17-19, 1982, Walla Walla College, Walla Walla, Washington.

952
Tarrant, R.F., B.T. Bormann, D.S. DeBell, and W.A. Atkinson. Managing red alder in the Douglas-fir region: A look at some possibilities. J. For. 81:787-792.

953
Yost, R.S., D.S. DeBell, C.D. Whitesell, and S.C. Miyasaka. 1987. Early growth and nutrient status of *Eucalyptus saligna* as affected by nitrogen and phosphorus fertilizer. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. 25 pp.

UTAH STATE UNIVERSITY

954
Barker, J.R. 1981. Genetic differences between large and small *Artemisia tridentata* plants in contiguous populations. Ph.D. dissertation. Utah State University, Logan. 113 pp.

955
McKell, C.M. 1984. New biotechnologies to unlock plant resources of arid lands. Paper presented at International Symposium on Progress in Management of Resources of Arid and Semiarid Lands, November 14-16, 1984, Mendoz, Argentina.

956
McKell, C.M., J.R. Barker, and G. Van Epps. 1982. Environmental influences on big sagebrush (*Artemisia tridentata*) size. IN Proc., Sagebrush Symposium. Utah State University, U.S. Forest Service Shrub Research Laboratory, Provo.

957
Van Epps, G., J.R. Barker, and C.M. McKell. 1982. Energy biomass from high producing rangeland shrubs of the intermountain United States. J. Range Manage. 35(1):22-25.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

958
Farrar, K.D. 1981. In-site stand generator for use in harvesting machine simulators. M.S. thesis. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 211 pp.

959
Gleason, A.P. 1981. The development of an infeed mechanism and strapping device for the forest residue baler. M.S. thesis. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 67 pp.

960
Hokans, R.H., and W.B. Stuart. 1983. Yard-to-mill woodflow scheduling by microcomputer. South. J. Appl. For. 7(1):50-53.

961
King, F.M. 1981. A method of assessing the lower limits of utilization of a conventional harvesting system performing an integrated harvest on a variety of stands. M.S. thesis. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 143 pp.

962
Kluender, R.A., and T. Reisinger. 1983. Storage and handling of whole tree chips and residues for fuel. Publication No. 83A2. American Pulpwood Association, Washington, DC. 12 pp.

963
Kluender, R.A. 1982. Fuel conservation manual for forestry industry operations. Publication No. 82A3. American Pulpwood Association, Washington, DC. 18 pp.

964
Kluender, R.A., T. Reisinger, W.B. Stuart, and K.D. Farrar. 1981. An analysis of several alternatives to oil as an industrial fuel. Forestry and Wildlife Research Series. FWS 7-82. Virginia Polytechnic Institute and State University, Blacksburg. 38 pp.

965
Kluender, R.A., and K. Seward. 1981. A practical approach to the establishment of a whole tree chipping operation. American Pulpwood Association, Washington, DC.

966
Lawrence Jr., W.E., and W. Emory. 1981. Field-drying logging residues as an industrial fuel. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 109 pp.

967
Marley, D.S. 1982. An evaluation of existing and conceptual short-rotation energy plantation harvesting machines and systems. M.S. thesis. Virginia Polytechnic Institute and State University, Blacksburg. 213 pp.

968
Miliauskas, S.J., R.G. Oderwald, and R.B. Stuart. 1981. Extensively managed short-rotation Appalachian hardwood coppice for energy. pp. 81-85. IN J.J. Talbot and W. Swanson (eds.) WOODPOWER: New perspectives on forest usage. Pergamon Press, New York.

969
Oderwald, R.G., W.B. Stuart, and K.D. Farrar. 1980. The forest model file: A mapped stand library at Virginia Tech. For. Sci. 26(2):193-194.

970
Oderwald, R.G., W.B. Stuart, and E.C. Ford III. 1979. Location of full tree centers of gravity for Appalachian hardwoods. South. J. Appl. For. 3(3):123-124.

971
Reisinger, T.W. 1981. An evaluation of in-plant handling systems for utilization of wood residues as fuel in the South. M.S. thesis. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 236 pp.

972
Skovran, J.D. 1981. Determining high lead yarding forces for whole tree Appalachian hardwoods. M.S. thesis. Virginia Polytechnic Institute and State University, Industrial Forestry Operations Program, Blacksburg. 87 pp.

973
Stuart, W.B. 1981. Can we harvest the resource? pp. 117-121. IN Proc., Ninth Annual Hardwood Symposium of the Hardwood Research Council. Hardwood Research Council, Asheville, North Carolina.

974
Stuart, W.B. 1981. Harvesting analysis technique: A computer simulation system for timber harvesting. For. Prod. 31(11):45-53.

975
Stuart, W.B., and R.G. Oderwald. 1981. Present and future capital investment in timber harvesting. J. For. 79(11):748-749.

976
Stuart, W.B., J.V. Perumpral, T.A. Walbridge, and S. Shartle. 1981. Pine plantation data for future equipment design. Trans. ASAE 24(3):568-571, 578.

977
Stuart, W.B., C.D. Porter, T.A. Walbridge, and R.G. Oderwald. 1981. Economics of modifying harvesting systems to recover energy wood. For. Prod. 31(8):37-42.

978
Stuart, W.B. 1980. Application of computer simulation in evaluating harvesting systems. AIChE Symp. Ser. 76:31-35.

979
Stuart, W.B., R.G. Oderwald, and E.C. Ford III. 1980. Prism cruising coefficients for Appalachian hardwoods biomass. South. J. Appl. For. 4(1):25-26.

980
Stuart, W.B., C.D. Porter, T.A. Walbridge, and R.G. Oderwald. 1980. The potential of modifying conventional harvesting systems for recovering logging residues as an energy source. pp. 377-389. IN Proc., 1980 TAPPI Annual Meeting. TAPPI Press, Appleton, Wisconsin.

981
Walbridge Jr., T.A., and W.B. Stuart. 1980. An alternative to whole tree chipping for the recovery of logging residues. pp. 132-138. IN Proc., International Conference on Harvesting and Utilization for Energy. Swedish University of Agricultural Sciences, Uppsala, Sweden.

982
Walbridge, T.A., and W.B. Stuart. 1983. Systems and procedures for integrated recovery of forest biomass. TAPPI 66(3):89-97.

UNIVERSITY OF WASHINGTON
WASHINGTON STATE UNIVERSITY

983
Ager, A. 1987. Patterns of genetic variation in red alder. Unpublished technical report submitted to U.S. Dept. of Energy's Short Rotation Woody Crops Program. University of Washington, Seattle. 135 pp.

984
Fenn, R.C. 1987. Variation patterns in morphology and growth in F_1, F_2, and backcross hybrids of *Populus trichocarpa* T&G and *Populus deltoides* Marsh. M.S. thesis. University of Washington, Seattle. 234 pp.

985
Figliola, A.L. 1986. Studies in the physiology, morphology, and anatomy of *P. trichocarpa*, *P. deltoides*, and their hybrids. M.S. thesis. University of Washington. 131 pp.

986
Heilman, P.E. 1987. Competition vs. nitrogen fixation in mixed cottonwood/red alder stands: Results on a nitrogen-poor substrate (abstract). pp. 412. IN Proc., 14th International Botanical Congress. Berlin, West Germany.

987
Heilman, P.E. 1986. Culture and potential markets for hybrid poplar plantations. Paper presented at meeting of Farm Forestry Organization of Lewis and Cowlitz counties, March 18, 1986, Chehalis, Washington.

988
Heilman, P.E. 1986. Research and development and operational forest fertilization, northwest United States. pp. 129-138. IN Proc., IEA/BA Task II Workshop: Production Technology, Economics and Nutrient Cycling. ENFOR Secretariat, Ottawa, Ontario, Canada.

989
Heilman, P.E., and R.F. Stettler. 1986. Nutritional concerns in selection of black cottonwood and hybrid clones for short rotation. Can. J. For. Res. 16:860-863.

990
Heilman, P.E. 1985. Hybrid poplar: Is there a future for it? Status of research and future plans. Paper presented at Forest Advisors Workshop, October 30, 1985, Olympia, Washington.

991
Heilman, P.E., and R.F. Stettler. 1985. Mixed, short-rotation culture of red alder and black cottonwood: Growth, coppicing, nitrogen fixation and allelopathy. For. Sci. 31(3):607-616.

992
Heilman, P.E. 1982. Nitrogen and organic matter accumulation in coal mine spoils supporting red alder stands. Can. J. For. Res. 12:809-813.

993
Heilman, P.E. 1982. Nodulation and nitrogen fixation by red alder and sitka alder on coal mine spoils. Can. J. For. Res. 12:991-997.

994
Heilman, P.E. 1981. Benefits of wood biomass make cultivation essential. Weeds Trees Turf 20(2):38-40.

995
Heilman, P.E., and D.V. Peabody Jr. 1981. Effect of harvest cycle and spacing on productivity of black cottonwood in intensive culture. Can. J. For. Res. 11:118-123.

996
Heilman, P.E. 1979. Use of alder in coal spoil reclamation in the Pacific Northwest (abstract). pp. 477. IN J.C. Gordon, C.T. Wheeler and D.A. Perry (eds.) Symbiotic nitrogen fixation in the management of temperate forests. Oregon State University, Forest Research Laboratory, Corvallis.

997
Heilman, P.E., and G. Ekuan. 1979. Effect of planting stocklength and spacing on growth of black cottonwood. For. Sci. 25:439-443.

998
Hinckley, T.M., R.F. Stettler, E. Van Vokenburgh, P.J. Schulte, J.G. Isebrands, G. Scarascia, and B. Smit-Spinks. 1987. Growth and productivity of *Populus* spp. and their hybrids: Role of genotype, morphology, and physiology (abstract). pp. 388. IN Proc., 14th International Botanical Congress. Berlin, West Germany.

999
Hinckley, T.M. 1985. Short-rotation intensive culture of *Populus*: The role of physiology. Paper presented to the Interdisciplinary Plant Group, August 23, 1985, University of Missouri, Columbia.

1000
Ridge, C.R., T.M. Hinckley, R.F. Stettler, and E. Van Volkenberg. 1986. Leaf growth characteristics of fast growing hybrids (*Populus trichocarpa* x *P. deltoides*). Tree Physiol. 1:209-216.

1001
Scarascia-Mugnozza, G., J.G. Isebrands, T.M. Hinckley, and R.F. Stettler. 1987. Patterns of assimilate allocation and relative contributions of the portions of the crown in four poplar (*Populus*) clones (abstract). pp. 441. IN Proc., 14th International Botanical Congress. Berlin, West Germany.

1002
Scarascia-Mugnozza, G., T.M. Hinckley, and R.F. Stettler. 1986. Evidence for nonstomatal inhibition of net photosynthesis in rapidly dehydrated shoots of *Populus*. Can. J. For. Res. 16(6):1371-1375.

1003
Schulte, P.J., and T.M. Hinckley. 1987. Abscisic acid relations and the response of *Populus trichocarpa* stomata to leaf water potential. Tree Physiol. 3:103-113.

1004
Schulte, P.J., and T.M. Hinckley. 1987. The relationship between guard cell water potential and the aperture of stomata in *Populus*. Plant Cell Environ. 10:313-318.

1005
Schulte, P.J., T.M. Hinckley, and R.F. Stettler. 1987. Stomatal responses of *Populus* to leaf water potential. Can. J. Bot. 65:255-260.

1006
Schulte, P.J., and T.M. Hinckley. 1985. A comparison of pressure-volume curve data analysis techniques. J. Experimental Botany 36:1590-1602.

1007
Schulte, P.J., and T.M. Hinckley. 1985. Stomatal aperture and guard cell water relationships in *Populus* (abstract). Plant Physiology (Suppl.) 77:142.

1008
Stettler, R.F. 1987. Forest/plant biotechnology: An *integrated approach. Lecture presented at* seminar series, "Environmental benefits and risks of genetically engineered organisms", May 7, 1987, University of Washington, Seattle.

1009
Stettler, R.F., P.E. Heilman, J.M. Dunlap, and D.L. Roger. 1987. Breeding of Northern American poplars for short-rotation intensive culture (abstract). pp. 164. IN Proc., 14th International Botanical Congress.

1010
Stettler, R.F. 1985. Biotechnology in the poplar program at the University of Washington. Paper presented at meeting of chief executive officers of the Northwest pulp and paper industry, May 9, 1985.

1011
Stettler, R.F. 1985. Biotechnology in the poplar program at the University of Washington. Paper presented at meeting of staff at the Washington State Department of Natural Resources Research Branch, May 10, 1985.

1012
Stettler, R.F., and P.E. Heilman. 1984. Short-rotation poplar culture in the Pacific Northwest: Components of a genetic program. pp. 217-232. IN K. Perttu (ed.) Ecology and management of forest biomass production systems. Agric. Sci. Rep. 15. University of Sweden.

1013
Stettler, R.F. 1983. Conceptual approach to the genetic improvement of northwestern hardwoods. Paper presented to the Forestry Energy Program Group B of the International Energy Agency, October 20, 1983, Seattle, Washington.

1014
Stettler, R.F., C. Fenn, and A.L. Figliola. 1982. Genetic and physiological studies of *Populus trichocarpa* and its hybrids. IN Proc., 7th North American Forest Biology Workshop. University of Kentucky, Lexington.

1015
Stettler, R.F., R. Koster, and V. Steenackers. 1980. Interspecific crossability studies in poplars. Theoret. Appl. Genet. 58:273-282.

1016
Van Volkenburgh, E., C. Ridge, and T.M. Hinckley. 1985. Limits to poplar leaf growth (abstract). Plant Physiology (Suppl.) 77:136.

1017
Weber, J. 1980. Isoenzyme variation among ten populations of *Populus trichocarpa* (Torr. & Gray) in the Pacific Northwest. M.S. thesis. University of Washington, Seattle. 88 pp.

1018
Weber, J., and R.F. Stettler. 1981. Isoenzyme variation among the populations of *Populus trichocarpa* (Torr. & Gray) in the Pacific Northwest. Silvae Genet. 30:82-87.

1019
Wiard, B.M. 1987. Growth of selected *Populus* clones as affected by leaf orientation, light interception and photosynthesis. M.S. thesis. *University of Washington, Seattle.* 131 pp.

APPENDIX A. SHORT ROTATION WOODY CROPS PROGRAM INVESTIGATORS

APPENDIX A. SHORT ROTATION WOODY CROPS PROGRAM INVESTIGATORS

W. Clark Ashby
Southern Illinois University
Department of Botany
Carbondale, IL 62901
(618)536-2331

Paul Blankenhorn
The Pennsylvania State University
School of Forest Resources
310 Forest Resources Laboratory
University Park, PA 16802
(814)865-4841

Bruce Bongarten
University of Georgia
School of Forest Resources
Athens, GA 30602
(404)542-7247

Todd Bowersox
The Pennsylvania State University
School of Forest Resources
310 Forest Resources Laboratory
University Park, PA 16802
(814)865-4841

Joe Cowles
University of Houston
Biology Department
Houston, TX 77004
(713)749-3135

Thomas B. Crabb
Bioenergy Development Corporation
888 Kalanianaole Avenue
Hilo, HI 96720
(808)961-0411

Dennis Curtin
Tennessee Valley Authority
Forest Resource Development Program
Norris, TN 37828
(615)494-9800

Dean DeBell
USDA Forest Service
Pacific Northwest Forestry Science Laboratory
3625 93rd Ave., S.W.
Olympia, WA 98502
(206)753-9470

Don Dickmann
Michigan State University
Department of Forestry
East Lansing, MI 48824-1222
(517)353-5199

Linda Dolan
Seattle City Light
Energy Projects and Policy Analysis
1015 Third Avenue
Seattle, WA 98104
(206)-625-3063

Rouse Farnham
University of Minnesota
Soil Science Department
St. Paul, MN 55108
(612)373-1447

Peter Felker
Texas A & I University
College of Agriculture
Kingsville, TX 78363
(512)595-3922

Douglas Frederick
North Carolina State University
School of Forest Resources
Box 5488 Department of Forestry
Raleigh, NC 27650
(919)737-2893

Wayne A. Geyer
Kansas State University
Department of Forestry
Call Hall
Manhattan, KS 66506
(913)532-6923

Richard Hall
Iowa State University
Department of Forestry
251 Bessey Hall
Ames, IA 50011
(515)294-1453

Jim Hanover
Michigan State University
Department of Forestry
East Lansing, MI 48824
(517)353-7671

Edward A. Hansen
USDA Forest Service
North Central Experiment Station
Forestry Sciences Laboratory
P. O. Box 898
Rhinelander, WI 54501
(715)362-7474

Paul Hellman
Washington State University
Western Washington Research and Extension Center
Puyallup, WA 98371
(206)840-8522

L. Hogan
University of Arizona
Department of Plant Sciences
Tucson, AZ 85720

Dale Johnson
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6038
(615)574-4262

Samuel B. Land, Jr.
Mississippi State University
Department of Forestry
P. O. Drawer FR
Mississippi State, MI 39762
(601)325-2946

Timothy Ku
University of Arkansas
Department of Forestry
Monticello, AR 71655
(501)367-2835

Russ Lea
North Carolina State University
School of Forest Resources
Department of Forestry
Raleigh, NC 27650
(919)737-3674

Cyrus McKell
Utah State University
Plant Resources Institute
417 Wakara Way
Salt Lake City, UT 84108
(801)582-0144

John Mexal
Energy/Development International
P. O. Drawer 1777
Las Cruces, NM 88004-1777
(505)646-3335

L. David Ostlie
Northern States Power Company
414 Nicollet Mall
Minneapolis, MN 55401
(612)337-2169

Jack Ranney
Oak Ridge National Laboratory
P.O. Box 2008
Oak Ridge, TN 37831-6352
(615)574-7363

Donald L. Rockwood
University of Florida
118 Newins-Ziegler Hall
Gainesville, FL 32611
(904)392-1850

Gary Rolfe
University of Illinois
Department of Forestry
Urban, IL 61801
(217)333-2770

Robert Sajdak
Michigan Technological University
Department of Forestry
Houghton, MI 49931
(906)487-2338

Klaus Steinbeck
University of Georgia
School of Forest Resources
Athens, GA 30602
(404)542-1376

Reinhard Stettler
University of Washington
College of Forest Resources
Seattle, WA 98195
(206)543-2723

Charles Strauss
The Pennsylvania State University
School of Forest Resources
310 Forest Resources Laboratory
University Park, PA 16802
(814)865-4574

Bill Stuart
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061
(703)961-7674

Charles Tauer
Oklahoma State University
Department of Forestry
013 South Ag Hall
Stillwater, OK 74078
(405)624-5462

Abraham Weaver
Tuskegee University
Carver Research Foundation
Tuskegee, AL 36088
(205)727-8827

Craig D. Whitesell
USDA Forest Service
Pacific Southwest Forest Experiment Station
1151 Punchbowl Street, RM 323
Honolulu, HI 96813
(808)541-2628

John Yarie
University of Alaska
Forest Soils Laboratory
Fairbanks, AK 99701
(907)474-7443

APPENDIX B. KEYWORD INDEX

APPENDIX B. KEYWORD INDEX

ACCLIMATIZATION 189, 191

ACCRETION 208, 714

ACCUMATIZATION 155

ACER SPP. 267, 271, 336, 339, 633

ACETYLENE 664, 670, 677

ACID 3, 81, 1003

AGE 234, 298, 325, 376, 581, 951

AGED 408, 409, 928

AGROBACTERIUM 731

AGROFORESTRY 48, 297, 298

AIGEIROS 698, 699

ALABAMA 177, 479

ALASKA 3, 4

ALBIZIA 19, 20, 924

ALGARROBO 672, 673, 685

ALDER see Alnus

ALLELOPATHY 874, 991

ALLOCATION 232, 778, 881, 1001

ALNUS SPP. 2, 226, 227, 229, 230, 231, 232, 233, 234, 235, 236, 348, 349, 406, 443, 477, 516, 700, 712, 713, 715, 716, 760, 874, 917, 918, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 939, 940, 941, 942, 943, 944, 945, 946, 948, 949, 950, 951, 952, 983, 986, 991, 992, 993, 996

ALTITUDE 831

ANALYZER 500, 501

ANATOMICAL 192

ANATOMY 188, 788, 834, 985

APERTURE 1004, 1007

APPALACHIAN 405, 968, 970, 972, 979

ARCHITECTURE 696, 697, 705, 787, 827

AREA 152, 392, 393, 558, 658, 790

ARGENTINA 82

ARID 43, 657, 658, 663, 667, 672, 675, 680, 686, 955

ARIZONA 44

ARTEMISIA 954, 956

ARTIFICIAL 183, 600, 875

ASH 594, 798

ASPEN see Populus spp.

ASSOCIATED 668, 773

ATLANTIC 363, 410

ATMOSPHERE 603

AUXINS 684

AXILLARY 687

BACKCROSS 984

BALANCE 1, 222, 584, 585

BALER 630, 644, 645, 646, 959

BAREROOT 296

BARK 77, 136, 137, 157, 329, 473, 856

BEETLE 26, 698, 699, 771, 772, 773

BIOCHEMICAL 833

BIOFUEL 531, 663, 672, 686

BIOLOGICAL 758, 804, 926

BIOLOGY 517, 698, 917, 918

BIONOMICS 699

BIORESOURCES 291

BIOTECHNOLOGY 512, 514, 515, 516, 735, 736, 739, 782, 820, 823, 870, 871, 885, 955, 1008, 1010, 1011

BIRCH 3, 339

BLACKSTEM 841

BLIGHT 844

BOLE 464

BORDER 761, 908

BOREAL 1

BORER 817

BOTTOM 409

BOTTOMLAND 375, 408, 411, 446, 451, 458, 465, 466, 467

BRANCH 282, 464, 696, 697, 763, 787, 827, 829

BREEDING 87, 115, 302, 303, 477, 870, 871, 886, 894, 917, 1009

BROAD 441

BROWSING 838

BUD 687, 947

BUNCHER 374, 487, 637, 641, 642

BURNING 496, 497, 533, 867

CAATINGA 45

CALCAREOUS 682

CALLUS 147, 148

CALORIC 81, 156, 411

CALORIFIC 138

CANKER 599, 601, 602, 775, 806, 816, 853, 854, 883

CANOPY 705, 905

CARBOHYDRATE 650, 727

CARBON 1, 58, 603, 323, 720, 721, 778

CAROLINA 368, 369, 395, 397, 491, 492

CASUARINA 51, 83, 84, 85, 106, 108, 120

CELL 815, 1004, 1007

CENTRAL 4, 231, 255, 278, 710, 805, 820, 823, 842, 845, 882, 895, 896, 900

CERCIDIUM 665

CHAR 603, 611

CHEMICAL 116, 137, 195, 197, 202, 203, 204, 270, 288, 289, 291, 303, 319, 412, 493, 573, 574, 575, 578, 580, 581, 583, 594, 654, 719, 723, 928, 932, 946, 951

CHINESE TALLOW TREE see Sapium spp.

CHIPPING 965, 981

CHIPS 238, 857, 962

CHLOROPLAST 155

CHOPPING 330

CHRYSOMELA 698, 771, 772

CHRYSOMELIDAE 771, 772

CLAY 932

CLIMATE 868, 905

CLIMATOLOGICAL 255

CLIMAX 333, 470

CLONE 86, 232, 341, 366, 573, 574, 575, 580, 597, 598, 684, 685, 687, 688, 691, 692, 697, 701, 718, 726, 734, 736, 763, 768, 773, 777, 783, 817, 826, 827, 828, 829, 846, 847, 848, 849, 850, 851, 852, 863, 865, 881, 887, 889, 892, 899, 901, 989, 1001, 1019

COAL 992, 993, 996

COASTAL 99, 194, 357, 363, 365, 381, 383, 391, 410, 412, 458, 461, 463, 468

COEFFICIENTS 979

COFFEETREE 272, 284

COLD 674, 681, 873

COLEOPTERA 771, 772

COMBUSTION 78, 142, 594

COMMERCIAL 595, 825

COMMERCIALIZATION 102, 526

COMPETITION 416, 527, 710, 986

COMPONENTS 356, 1012

COMPOSITION 288, 289, 333, 413, 470, 486, 575, 580

COMPUTER MODEL 313, 498, 509, 617, 637, 696, 707, 786, 809, 969

CONCENTRATIONS 210, 455, 464, 650, 682, 712, 715, 716, 928

CONDUCTANCE 810

CONIFEROUS 161, 190, 423, 719, 750, 840, 869

CONSUMPTION 240, 771

CONTAINER 840

CONTIGUOUS 954

CONVERSION 90, 212, 248, 613, 880

COPLANTED 874

COPPICE 52, 87, 88, 92, 113, 122, 123, 145, 179, 180, 181, 211, 243, 254, 256, 457, 481, 489, 490, 491, 492, 560, 807, 816, 856, 858, 888, 906, 929, 939, 944, 968, 991

COTTONWOOD see Populus spp.

CROWN 552, 696, 780, 787, 827, 881, 1001

CULTIVATION 60, 919, 994

CULTURE 51, 65, 94, 95, 104, 144, 147, 148, 150, 155, 158, 160, 161, 163, 165, 166, 167, 169, 170, 171, 185, 186, 188, 189, 191, 192, 193, 222, 230, 236, 294, 304, 317, 390, 433, 490, 494, 502, 503, 524, 526, 530, 534, 564, 582, 587, 592, 614, 629, 634, 638, 643, 687, 689, 693, 696, 697, 698, 699, 704, 710, 711, 724, 734, 736, 737, 751, 754, 755, 756, 757, 760, 764, 765, 767, 771, 773, 775, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 797, 800, 805, 806, 810, 814, 815, 818, 825, 826, 827, 829, 845, 858, 859, 876, 878, 886, 893, 894, 901, 902, 904, 905, 913, 915, 916, 930, 931, 987, 991, 995, 999, 1009, 1012

CUTICLE 847

CUTTING 267, 718, 748, 763, 861, 862

CUTTINGS 214, 367, 649, 650, 671, 684, 685, 725, 727, 728, 759, 768, 841, 860, 863, 864, 865, 947

CYTOKININ 862

DAMAGE 695, 841, 943

DAWN 799

DENSITY 15, 16, 123, 136, 146, 155, 385, 456, 769, 920, 921

DIAMETER 15, 16, 589, 718, 763, 921, 954

DIFFERENTIATION 171, 186, 187

DIMENSIONAL 45

DISEASE 599, 601, 807, 842, 845

DISLOCATIONS 794, 795

DIURNAL 719, 723

DIURON 692

DORMANT 727, 839, 860

DOTHICHIZA 883

DRAINAGE 899

DROUGHT 659

DRY 325, 326, 327, 376, 377, 378, 386

EARLY 37, 41, 434, 695, 718, 741, 759, 840, 848, 892, 953

ECOLOGY 698, 773

ECONOMICS 65, 242, 274, 275, 276, 280, 311, 400, 504, 522, 525, 527, 530, 577, 595, 609, 616, 626, 637, 655, 876, 977

ECOPHYSIOLOGICAL 313, 707, 809

ECOSYSTEMS 675, 909

ELECTRON 148, 185, 189

ELM see Ulmus spp.

EMBRYOGENESIS 169, 815

EMBRYOS 184

ENSILEMENT 288

ENSILING 289

ENVIRONMENT 86, 98, 99, 105, 233, 309, 553, 556, 655, 685, 726, 778, 804, 821, 850, 956

EPIDEMIOLOGY 599, 896

EROSION 528

ESTABLISHMENT 4, 221, 223, 224, 227, 448, 624, 692, 693, 747, 755, 757, 763, 783, 947, 965

ETHANOL 579, 679

ETHER 2

ETHYLENE 830, 832, 834

ETIOLOGY 599

EUCALYPTUS SPP. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 26, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 40, 41, 52, 53, 59, 63, 64, 66, 82, 86, 87, 88, 89, 90, 91, 92, 93, 102, 103, 112, 113, 118, 122, 123, 125, 126, 130, 131, 136, 144, 145, 324, 325, 326, 327, 372, 376, 377, 378, 385, 386, 414, 433, 473, 484, 831, 832, 833, 834, 921, 922, 923, 924, 925, 953

EXTRACTIVES 139, 143, 329

FALL 455

FAMILIES 485, 942, 943

FEED 288, 289, 290

FEEDING 2, 772

FEEDSTOCK 65, 70, 115, 201, 524, 526, 551, 579

FEEDSTUFF 825

FELLER 374, 487, 637, 641, 642

FENUSA 226, 231

FERTILITY 5, 690

FERTILIZATION 39, 41, 66, 85, 121, 146, 449, 455, 507, 508, 554, 588, 589, 650, 690, 802, 945, 988

FERTILIZER 23, 35, 36, 331, 358, 454, 469, 591, 752, 953

FIBER 202, 433, 542, 757, 794, 795, 819, 914

FIELD 47, 155, 312, 374, 487, 504, 636, 641, 642, 653, 728, 778, 808, 828, 966

FINANCIAL 296, 613, 619, 620, 621, 622, 623, 729, 800

FIR 950, 952

FIREWOOD 216, 277, 281, 907

FIRST 31, 572, 577, 597, 598, 615, 620, 621, 696, 816, 827, 856

FIXATION 232, 664, 670, 676, 677, 720, 986, 991, 993

FIXING 19, 651, 717, 914

FLAKEBOARD 734

FLOOR 946, 950

FLORIDA 46, 49, 51, 53, 56, 60, 79, 82, 88, 89, 96, 100, 102, 104, 109, 112, 113, 116, 117, 120, 122, 123, 124, 126, 130, 131, 132, 133, 135, 137, 138, 140, 145, 484, 637

FLUX 155, 769

FOLIAGE 455, 486, 773, 825

FOLIAR 358, 690, 715, 928, 945

FORMATION 85, 832, 833

FROST 53, 86, 943

FUEL 7, 57, 134, 139, 142, 193, 195, 238, 269, 279, 291, 314, 394, 395, 529, 550, 574, 584, 611, 626, 627, 635, 757, 962, 963, 964, 966, 971

FUELWOOD 6, 43, 140, 209, 239, 240, 265, 266, 274, 287

FUNGAL 684

FUNGICIDAL 806

GASIFICATION 252, 282

GENE 730, 732

GENETICS 42, 47, 67, 68, 69, 71, 72, 73, 74, 75, 76, 82, 88, 89, 91, 92, 93, 94, 111, 115, 118, 122, 123, 126, 128, 129, 144, 297, 299, 300, 308, 318, 320, 352, 353, 354, 356, 367, 413, 430, 435, 438, 444, 473, 474, 485, 518, 738, 740, 777, 833, 868, 872, 954, 983, 1012, 1013, 1014

GENOTYPE 126, 233, 317, 774, 998

GEORGIA 152, 172, 179, 357

GERMPLASM 656

GLEDITSIA SPP. 272, 284, 297, 798

GLYPHOSATE 693, 730, 732, 839

GRAVITY 153, 329, 352, 970

GREENHOUSE 215, 307, 828

GREENWOOD 768, 862, 863

GROWTH 19, 24, 35, 36, 37, 41, 54, 94, 123, 126, 174, 232, 235, 262, 295, 296, 305, 313, 319, 322, 323, 403, 434, 446, 451, 454, 456, 482, 483, 504, 554, 586, 591, 648, 654, 669, 695, 697, 700, 707, 718, 746, 752, 759, 760, 774, 786, 809, 828, 840, 848, 868, 869, 875, 888, 904, 906, 935, 939, 942, 945, 950, 953, 984, 991, 997, 998, 1000, 1016, 1019

GULF 194, 363, 410

HARVEST 22, 457, 481, 520, 786, 961, 973, 995

HARVESTING 28, 273, 332, 422, 437, 450, 487, 494, 509, 510, 556, 557, 638, 640, 642, 643, 647, 888, 958, 961, 967, 974, 975, 977, 978, 980

HAWAII 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 27, 28, 29, 30, 31, 32, 33, 34, 37, 38, 921, 922, 923, 924

HEAT 78, 139, 143, 594, 608, 659

HEATING 611

HEIGHT 589, 746, 760, 869, 935

HEMLOCK 950

HERBICIDE 215, 217, 218, 219, 221, 224, 245, 260, 272, 284, 285, 286, 499, 657, 692, 694, 708, 732, 740, 751, 812, 813, 814, 837, 840

HERBIVORY 1

HONEYLOCUST see Gleditsia spp.

HUMID 105

HYBRIDIZATION 292

HYBRIDS 575, 580, 581, 594, 600, 601, 602, 604, 774, 807, 862, 920, 984, 985, 998, 1000, 1014

HYDROCARBON 60, 61, 62

HYDROPONIC 863

ILLINOIS 205, 218, 223, 632

IMAZAPYR 835

IN VITRO 162, 168, 171, 189, 191, 348, 349, 350, 634, 694, 813

INBREEDING 91, 93

INCUBATION 601, 602

INDUSTRY 702, 782, 819, 963, 964, 966

INFECTION 895, 897

INJURY 817, 898

INOCULATED 602

INOCULATION 600, 677

INOCULUM 83, 84, 85

INSECT 695, 773

INTEGRATION 291, 647, 777, 792, 793, 805, 836, 870, 871, 961, 982, 1008

INTERCEPTION 313, 781, 809, 1019

IOWA 231, 883, 900

IRONWOOD 665, 670

IRRIGATION 588, 589, 591, 610, 653, 657, 660, 764, 799, 801, 887, 891, 913, 939

ISOENZYME 1017, 1018

JUVENILE 207, 355, 766, 785, 857, 906

KANSAS 239, 240, 241, 263, 264, 265, 283, 287

KENTUCKY 272, 284, 673

KRAFT 597, 598, 775, 785, 788, 791, 855, 859, 901

LAKE 201, 729, 800, 876, 911

LAND 46, 201, 346, 596, 609, 657, 663, 672, 675, 680, 955

LARCH 785, 837, 859

LARIX 657, 681, 682, 897, 902, 904

LATEX 62

LEACHING 802

LEAD 972

LEAF/LEAVES 152, 185, 192, 312, 313, 602, 648, 691, 698, 699, 700, 716, 719, 771, 772, 773, 777, 781, 787, 790, 798, 799, 807, 808, 809, 843, 850, 853, 878, 879, 882, 884, 891, 895, 896, 1000, 1003, 1005, 1016, 1019

LEGUME/LEGUMINOUS 21, 30, 658, 659, 667, 673, 678, 688, 925

LEGUMINOSAE 683

LENGTH 180, 501, 565, 566, 761, 849

LEUCAENA 659, 686, 689

LIGHT 185, 313, 630, 649, 809, 851, 875, 905, 1019

LIME 24

LIQUID 186, 529, 864

LIQUIDAMBAR 146, 148, 155, 158, 160, 162, 166, 167, 169, 186, 188, 189, 191, 448, 456, 457, 474, 485, 488

LIRIODENDRON 360

LITTERFALL 910, 949

LOAM 932

LOCUST see Robinia spp.

LOGGING 966, 980, 981

LONGLEAF 171

LOWLAND 475

LUMBER 418, 652

MAINTENANCE 224, 499

MANAGEMENT 99, 182, 193, 227, 264, 400, 419, 421, 423, 427, 432, 474, 544, 572, 573, 577, 605, 606, 622, 623, 624, 652, 655, 678, 709, 750, 803, 805, 806, 836, 952, 968

MANIPULATION 128, 444

MAPLE see Acer

MARSSONIA 853

MATTER 325, 326, 327, 376, 377, 378, 386, 992

MAXIMIZING 124, 565, 566, 610

MEDIA 864

MELALEUCA 54, 78, 79, 119, 137, 138, 142, 143

MELAMINE 508

MELAMPSORA 895, 896, 897

MESQUITE see Prosopis spp.

METHANE 70, 135

METHYL 2, 811, 813

MICHIGAN 293, 296, 299, 300, 308, 311, 315, 316, 317, 321, 333, 334, 335, 339, 340, 470, 471, 692

MICROAUTORADIOGRAPHY 722

MICRONUTRIENT 24, 648

MICROSCOPY 148, 185, 189

MIDWEST 221

MINE 235, 596, 992, 993

MINERAL 766, 946

MINNESOTA 343, 344

MIXED 17, 18, 21, 152, 392, 482, 483, 510, 712, 713, 922, 923, 925, 941, 986, 991

MOISTURE 136, 352, 385, 584, 759

MORPHOLOGY 187, 691, 774, 781, 787, 834, 890, 984, 985, 998

MOUNTAIN 393

MUNICIPAL 596, 607, 608, 610

MUTANT 730

MYCORRHIZAE 338

NEW MEXICO 42, 44

NITROGEN 20, 35, 36, 37, 41, 146, 208, 232, 328, 486, 507, 509, 521, 554, 603, 651, 664, 670, 675, 676, 677, 678, 712, 713, 714, 715, 716, 717, 752, 801, 802, 803, 914, 924, 953, 986, 991, 992, 993

NODULATION 83, 84, 664, 670, 993

NODULES 85

NONSEEDLING 878

NONSTOMATAL 1002

NORTH 49, 53, 294, 331, 332, 333, 334, 339, 368, 369, 395, 397, 449, 469, 470, 471, 491, 492, 530, 656, 695, 710, 767, 805, 820, 823, 835, 837, 840, 842, 845, 869, 882, 895, 896, 906, 1009

NORTHEASTERN 593

NORTHWEST 630, 988, 996, 1012, 1013, 1017, 1018

NURSERY 146, 285, 286, 309, 413, 421, 456, 474, 695, 816

NUTRIENT 1, 41, 172, 325, 326, 327, 332, 334, 369, 371, 376, 377, 378, 383, 386, 391, 450, 451, 452, 455, 458, 460, 461, 462, 463, 464, 465, 466, 467, 468, 471, 475, 490, 491, 510, 557, 594, 648, 682, 745, 765, 766, 944, 945, 949, 953

NUTRITION 347, 521, 773, 989

NYLON 288, 289

OAK 339, 510

OIL 964

OLIVE 222, 700

OLNEYA 665, 670

ORCHARD 90, 93, 227

PACIFIC 630, 996, 1012, 1017, 1018

PALOVERDE 665

PAPER 3, 598, 764, 775, 785, 788, 791, 819, 855, 857, 901

PAPERMAKING 605, 606

PARAQUAT 80, 81

PARASITE 804

PARENTAGE 578, 581, 583

PARKINSONIA 665

PATHOGENS 900

PATTERNS 488, 713, 881, 983, 984, 1001

PEAT 410

PEATLAND 341, 345

PECAN 187

PEST 836, 899

PETROCHEMICALS 141

PETROLEUM 199

PH 648

PHENOLOGY 138, 231, 662

PHOMOPSIS 883

PHOSPHORUS 35, 36, 37, 41, 486, 648, 953

PHOTON 769

PHOTOPERIOD 649

PHOTOSYNTHATE 313, 783, 789, 809, 826

PHOTOSYNTHESIS 155, 312, 554, 777, 781, 808, 810, 826, 828, 1002, 1019

PHOTOSYNTHETIC 691, 705, 769, 777, 821, 822

PHYLLOSTICTA 843

PHYSICAL 204, 205, 361, 362, 363, 412, 573, 581, 804

PHYSIOLOGICAL 295, 320, 521, 691, 774, 779, 784, 985, 998, 999, 1014

PHYTOMASS 941

PICEA SPP. 292, 310, 875

PIEDMONT 152, 172, 362, 446, 458, 459, 460

PINE see Pinus spp.

PINOSYLVIN 2

PINUS SPP. 8, 49, 50, 65, 68, 69, 80, 81, 94, 95, 107, 114, 121, 127, 128, 129, 147, 157, 171, 184, 296, 326, 377, 386, 414, 421, 422, 430, 454, 455, 507, 508, 510, 791, 875, 890, 911, 913, 976

PLAIN 99, 194, 357, 365, 381, 383, 391, 412, 458, 461, 463, 468

PLAINS 255, 259, 280, 363, 410, 522

PLANTING 23, 123, 183, 260, 270, 308, 319, 654, 746, 835, 866, 927, 997

PLANTLETS 155, 171, 189, 814

PLANTS 1, 60, 61, 161, 164, 190, 634, 730, 798, 810, 822, 954

PLATANUS SPP. 146, 152, 153, 174, 180, 207, 351, 352, 353, 354, 355, 356, 366, 367, 413, 479, 480, 481, 485, 486, 521, 552, 554

POD 656, 662, 679

POLYMER 864

POPLAR see Populus

POPULATION 87, 90, 360, 366, 558, 918, 954, 1017, 1018

POPULATIONS 360, 488

POPULUS SPP. 235, 275, 282, 293, 294, 295, 313, 319, 320, 323, 341, 507, 516, 562, 563, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 583, 586, 588, 589, 591, 593, 594, 595, 597, 598, 599, 600, 601, 602, 604, 605, 614, 622, 623, 691, 693, 696, 697, 698, 699, 700, 701, 702, 703, 705, 708, 712, 713, 718, 719, 720, 723, 724, 726, 727, 728, 729, 730, 731, 732, 733, 734, 736, 740, 742, 746, 748, 749, 751, 752, 754, 755, 757, 759, 760, 761, 762, 763, 766, 768, 771, 772, 773, 774, 775, 776, 777, 778, 780, 781, 783, 784, 786, 787, 789, 790, 792, 793, 794, 795, 797, 799, 800, 801, 802, 805, 806, 807, 809, 810, 811, 812, 814, 815, 817, 818, 821, 825, 826, 827, 828, 829, 834, 838, 839, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 857, 858, 860, 861, 862, 863, 864, 865, 868, 875, 876, 877, 878, 879, 881, 882, 883, 884, 886, 887, 888, 889, 891, 892, 894, 895, 896, 898, 899, 900, 901, 905, 906, 907, 910, 913, 919, 920, 929, 939, 941, 944, 947, 984, 986, 987, 989, 990, 991, 995, 997, 998, 999, 1000, 1001, 1001, 1002, 1003, 1004, 1005, 1007, 1009, 1010, 1011, 1012, 1014, 1015, 1016, 1017, 1018, 1019

POPULUSTO 813

POROSITY 157

POSITION 664, 763

POTATO 185

PREEMERGENT 219, 245, 284, 285, 286

PREPLANT 759

PRESSURE 851, 1006

PRICES 419

PRODUCTIVITY 50, 52, 92, 122, 306, 335, 340, 370, 410, 412, 423, 433, 512, 682, 690, 735, 774, 995, 998

PROGENY 121, 136, 114, 236, 429, 499, 651

PROPAGATION 149, 160, 161, 162, 166, 167, 190, 347, 348, 349, 350, 668, 725, 726, 865, 948

PROPAGULES 214

PROSOPIS SPP. 648, 649, 650, 651, 652, 653, 655, 656, 657, 659, 660, 661, 662, 663, 664

PROSOPIS SPP. (continued) 665, 666, 669, 671, 672, 673, 674, 676, 677, 678, 679, 680, 683, 684, 685, 687, 688, 689, 690

PROTECTANTS 271

PROTOPLASTS 878, 879

PROVENANCE 32, 33, 82, 234, 911

PULP 597, 598, 605, 606, 785, 819, 859, 901, 939

PULPING 704

PULPMILL 422

PULPWOOD 296

QUALITY 59, 111, 115, 183, 415, 425, 489, 856, 934, 937

QUANTUM 155

RADIATION 781

RADIOTRACERS 778

RAINFALL 86

RANGELAND 957

RECLAIMED 235

RECLAMATION 345, 996

RECYCLING 607

REDUCTION 664, 670, 677

REFORESTATION 398

REGENERATION 183, 382, 400, 426, 432, 520, 731, 733, 878, 884, 888

REGIMES 920

REPRODUCTION 437, 917, 918

RESIDUE 959, 962, 966, 971, 980, 981

RESIN 80, 81

RESISTANCE 226, 850, 854

RHIZOBIUM 335, 338, 340

RIVER 409

ROBINIA SPP. 152, 154, 208, 215, 217, 245, 272, 284, 338, 714

ROLL 635, 636

ROLLER 330

ROOT 85, 148, 157, 188, 500, 501, 632, 668, 761, 763, 766, 768, 848

ROOTING 235, 367, 649, 650, 671, 684, 685, 738, 768, 863, 864

ROOTSTOCK 180

ROTATION 4, 5, 44, 65, 125, 172, 173, 174, 175, 176, 178, 179, 180, 181, 204, 210, 211, 223, 243, 244, 246, 247, 248, 251, 253, 258, 261, 263, 264, 267, 288, 289, 290, 341, 368, 389, 448, 479, 480, 487, 489, 490, 491, 494, 498, 502, 503, 504, 505, 506, 513, 518, 519, 521, 523, 524, 526, 530, 535, 536, 538, 539, 540, 541, 543, 545, 547, 548, 549, 554, 559, 561, 563, 564, 565, 566, 568, 569, 570, 571, 572, 575, 577, 578, 580, 581, 583, 586, 587, 592, 593, 595, 597, 598, 614, 615, 619, 620, 621, 624, 638, 642, 643, 655, 693, 696, 704, 712, 734, 747, 750, 751, 758, 760, 765, 767, 775, 786, 787, 788, 790, 791, 792, 793, 796, 804, 805, 806, 818, 827, 829, 855, 856, 858, 859, 901, 914, 920, 967, 968, 989, 991, 999, 1009, 1012

RUBBER 830

RUMINAL 288, 289

RUMINANT 290, 825

RUST 895, 896

SAGEBRUSH see Artemisia

SALINITY 673

SALIX SPP. 341, 347, 725, 817, 919

SALMONELLA 730

SALT 830

SAMPLING 392, 393, 465, 480, 770

SAPERDA 898

SAPIUM SPP. 193, 194, 195, 196, 197, 198, 199, 200

SAWLOG 520

SCREENING 43, 52, 135, 226, 260, 303, 341, 663, 672, 674, 676

SEASON 145, 324, 372, 457, 481, 486, 554, 715, 716, 826, 839, 888, 910, 943

SEATTLE 630

SECOND 586, 597, 598, 614

SEED 93, 195, 214, 227, 271, 321, 421

SEEDED 215, 217, 220, 245, 271, 272, 284, 285, 286, 705

SEEDLING 24, 90, 123, 146, 155, 211, 214, 260, 296, 319, 322, 413, 429, 456, 474, 489, 490, 491, 492, 834, 835, 868, 869, 945, 950

SEEDLOT 413

SELECTION 44, 87, 115, 153, 228, 335, 340, 353, 354, 394, 493, 662, 694, 813, 814, 884, 892, 989

SEMIARID 6, 653, 654, 658

SENSITIVITY 63, 64, 593

SEPTORIA 599, 600, 601, 602, 775, 805, 806, 816, 854

SEPTOTINIA 843, 882

SHALLOW 942

SHOOTS 148, 184, 688, 727, 844, 848, 884, 1002

SHRUB 45, 342, 343, 344, 717, 957

SILVICULTURE 4, 96, 97, 98, 128, 129, 394, 424, 425, 498, 551, 706, 796, 926, 938

SIMAZINE 691, 692

SITE 5, 17, 18, 34, 98, 99, 204, 235, 330, 331, 332, 334, 352, 358, 370, 375, 403, 412, 412, 423, 442, 469, 471, 489, 492, 499, 572, 575, 580, 581, 605, 613, 653, 754, 922, 923, 934, 935, 937, 958

SLUDGE 596, 607, 939

SOIL 5, 25, 37, 46, 172, 194, 208, 210, 245, 323, 328, 332, 343, 414, 453, 454, 456, 508, 528, 605, 664, 682, 682, 690, 700, 712, 713, 714, 759, 799, 869, 899, 929, 932, 946, 951

SOLAR 212, 781

SOMACLONAL 811, 814, 819, 824

SOMATIC 815

SOUTH 8, 110, 113, 122, 123, 126, 130, 131, 137, 138, 145, 150, 218, 223, 353, 354, 361, 370, 371, 375, 391, 392, 406, 411, 421, 422, 425, 428, 430, 432, 436, 437, 441, 444, 459, 460, 461, 465, 467, 475, 476, 478, 482, 484, 488, 540, 653, 656, 686, 690, 971

SOUTHEAST 183, 379, 380, 394, 399, 401, 402, 403, 407, 408, 409, 443, 445, 448, 490, 550

SOUTHWEST 6, 43

SPACING 15, 16, 34, 125, 126, 127, 180, 204, 267, 457, 492, 565, 566, 748, 827, 829, 887, 921, 927, 995, 997

SPECIES 6, 23, 27, 31, 42, 43, 45, 46, 52, 100, 105, 110, 116, 135, 144, 156, 203, 218, 219, 223, 224, 243, 264, 288, 289, 297, 300, 301, 317, 350, 357, 359, 361, 362, 363, 394, 411, 442, 466, 491, 611, 629, 659, 663, 668, 669, 677, 704, 750, 874, 897, 914

SPOILS 992, 993, 996

SPOT 602, 843, 853, 882

SPRING 835

SPROUTING 331, 469, 936

SPROUTS 156, 336

SPRUCE see Picea

STAMINATE 187

STAND 49, 50, 224, 326, 333, 358, 359, 365, 377, 393, 399, 401, 402, 411, 426, 432, 434, 458, 470, 482, 665, 927, 928, 946, 949, 951, 958, 961, 969, 986, 992

STEAM 265, 278, 279, 282

STEM 130, 214, 484, 763, 807, 856, 947

STOCK 49, 50, 183, 304, 309, 347, 650, 816

STOCKLENGTH 997

STOMATA 810, 847, 849, 851, 1003, 1004, 1005, 1007

STOOL 748

STRESS 659

STRIPS 241

STRUCTURE 191, 333, 470, 558, 734, 780, 910, 915, 916, 927

STUMP 26, 331, 339, 419, 469

SUBCLONES 698, 699

SUBSTRATE 986

SUBTROPICAL 27

SUGAR 336

SULFOMETURON 811, 813, 835

SUMMER 86

SURFACE 794, 795

SURFICIAL 714

SURVIVAL 219, 319, 654, 718, 746, 840

SWAMP 407, 409, 410

SWEETGUM see Liquidambar spp.

SYCAMORE see Platanus spp.

TALLOW see Sapium spp.

TAMARACK 890, 915, 916

TAMARUGO 673

TEMPERATE 423, 909

TEMPERATURE 649, 861

TEMPORAL 328

TENSION 759, 794, 795, 832, 855

TEXAS 44, 653, 666, 686, 690

TEXTURE 899

THERMOCHEMICAL 248

THERMOCONVERSION 246

THIAMINE 684

THIDIAZURON 634

TILLAGE 692, 749

TIMBER 415, 417, 418, 974, 975

TIME 492, 861

TIP 768, 863

TISSUE 25, 144, 147, 148, 150, 155, 158, 160, 161, 163, 165, 166, 167, 169, 170, 171, 185, 186, 188, 192, 648, 650, 682, 689, 698, 699, 722, 733, 736, 737, 771, 773, 814, 878, 884

TOLERANCE 53, 215, 217, 218, 219, 673, 674, 681, 694, 708, 730, 732, 740, 811, 812, 813, 814

TRAIT 68, 69, 131, 234

TRANSECTS 918

TRANSFORMATION 731, 733, 884

TRANSLOCATION 798

TRANSPLANTING 657

TRITERPENOID 3

TROPICAL 439

TURPENTINE 81

ULMUS SPP. 237, 252

ULTRASTRUCTURE 155

UNDERSTORY 7, 8

UNROOTED 947

UPLAND 361, 371

UREA 508

VACUUM 857

VALUES 80, 138, 143, 156, 207, 303, 423, 574, 578, 583, 889

VAPOR 851

VARIANTS 811, 814

VEGETATIVE 149, 161, 190, 668, 948

VEIN 833

VERTEBRATE 1

VIDEO 500, 501

VIRGINIA 359, 393, 969

VIRUSES 701

VOLUME 361, 362, 363, 880, 1006

WALNUT 322, 874

WARM 105

WASHINGTON 932, 941, 946, 949, 1010, 1011

WASTE 447, 608

WASTEWATER 607, 608, 609, 610

WATER 59, 157, 329, 447, 675, 678, 722, 766, 797, 799, 846, 850, 852, 891, 942, 1003, 1004, 1005, 1007

WEED 29, 218, 270, 319, 654, 751, 755, 839

WEIGHT 336, 339, 361, 362, 363, 393

WEST 359, 393, 932, 938, 941, 946, 949, 950

WET 409

WETLAND 342, 343, 344, 370, 380, 447, 462

WIDTH 761

WILLOW see Salix spp.

WINDBREAKS 237, 241

WISCONSIN 330, 695, 698, 767, 773, 835, 837, 840, 869, 904, 906, 915, 916

WOODFLOW 960

WOODFUELS 662

WOODGRASS 920

WOODLANDS 45

XYLEM 831

YIELD 49, 59, 130, 211, 223, 251, 252, 255, 259, 262, 263, 264, 267, 379, 393, 399, 401, 402, 403, 446, 451, 457, 479, 480, 483, 484, 489, 491, 560, 586, 587, 588, 590, 591, 592, 597, 598, 603, 611, 697, 711, 742, 743, 777, 786, 887, 892, 895, 920, 939

INTERNAL DISTRIBUTION

1. R. S. Carlsmith
2. G. M. Caton
3. J. H. Cushman
4. T. W. Doyle
5-9. A. R. Ehrenshaft
10. J. T. Ensminger
11. M. P. Farrell
12. C. W. Gehrs
13. R. L. Graham
14. P. J. Hansen
15. S. G. Hildebrand
16. D. D. Huff
17. M. A. Huston
18. D. W. Johnson
19. J. W. Johnston
20. S. V. Kaye
21-25. P. A. Layton
26. R. J. Luxmoore
27. L. K. Mann
28. G. H. Marland
29-33. W. A. McNabb
34. M. E. Mitchell
35. R. J. Norby
36. C. J. Oen
37. E. G. O'Neill
38. M. L. Poutsma
39-43. J. W. Ranney
44. D. E. Reichle
45. C. R. Richmond
46. R. B. Shelton
47. D. S. Shriner
48. S. H. Stow
49. T. J. Tschaplinski
50. A. F. Turhollow
51. R. S. Turner
52. R. I. Van Hook
53. H. Van Miegroet
54. W. Van Winkle
55. T. J. Wilbanks
56-60. L. L. Wright
61. Biology Library
62. Central Research Library
63-77. ESD Library
78-79. Laboratory Records Department
80. Laboratory Records, RC
81. ORNL Patent Office
82. ORNL Y-12 Technical Library
83. IR&A Library

EXTERNAL DISTRIBUTION

84. W. C. Ashby, Department of Botany, Southern Illinois University, Carbondale, IL 62901
85. P. C. Badger, Southeastern Regional Biomass Energy Program, National Fertilizer Development Center, Tennessee Valley Authority, Muscle Shoals, AL 35660
86. D. Bancroft, Council of Great Lakes Governors, 122 West Washington Avenue, Suite 801A, Madison, WI 53703
87. B. Barkley, Fast Growing Forests Group (OMNR), P.O. Box 605, Brockville, Ontario K6v 5Y8, Canada
88. J. L. Beasley, Director, USDA Forest Service, P.O. Box 96090, Washington, DC 20012-6090
89. W. E. Bergeson, Natural Resources Research Institute, 3151 Miller Trunk Hwy., University of Minnesota, Duluth, MN 55811
90. P. R. Blankenhorn, School of Forest Resources, Pennsylvania State University, University Park, PA 16802
91. B. Bongarten, School of Forest Resources, University of Georgia, Athens, GA 30602
92. T. W. Bowersox, School of Forest Resources, Pennsylvania State University, University Park, PA 16802
93. S. Bull, Solar Energy Research Institute, 1617 Cole Boulevard, Golden, CO 80401

94. D. P. Burns, Director, Northeastern Forest Experiment Station, 370 Reed Road, Broomall, PA 19008
95. J. Thomas Callahan, Associate Director, Ecosystem Studies Program, Room 336, 1800 G Street, NW, National Science Foundation, Washington, DC 20550
96. M. G. R. Cannell, Institute of Terrestrial Ecology, Edinburgh Res. Sta., Bush Estats, Penicicuik, Midlothian, EH 260QB, Scotland, UK
97. N. S. Christopherson, USDA Forest Service, Forestry Sciences Laboratory, Forest Hill Road, Houghton, MI 49931
98. R. R. Colwell, Director of Maryland Biotechnology Institute, University of Maryland, Rm. 2A, Elkins Building, College Park, MD 20742
99. W. E. Cooper, Department of Zoology, College of Natural Sciences, Michigan State University, East Lansing, MI 48824
100. R. Costello, Biofuels and Municipal Waste Technology Division, CE-341, U.S. Department of Energy, Washington, DC 21585
101. T. B. Crabb, BioEnergy Development Corporation, 888 Kalanianaole Avenue, Hilo, HI 96720
102. D. T. Curtin, Department of Forestry, Fisheries, and Wildlife, Tennessee Valley Authority, Norris, TN 37828
103. R. C. Dahlman, Carbon Dioxide Research Division, Office of Energy Research, U.S. Department of Energy, Washington, DC 20550
104. David H. Dawson, 1835 N. Stevens Street, P.O. Box 1321, Rhinelander, WI 54501
105. J. O. Dawson, University of Illinois, Department of Forestry, 1301 Gregory Drive, Urbana, IL 61801
106. D. S. DeBell, USDA Forest Service, Forestry Sciences Laboratory, 3625 93rd Avenue, SW, Olympia, WA 98502
107. M. E. Demeritt, USDA Forest Service, Northeastern Forest Experiment Station, Box 640, Durham, NH 03824
108. D. I. Dickmann, Dept. of Forestry, Michigan State University, East Lansing, MI 48824-1222
109. R. J. Dinus, Institute of Paper Chemistry, P. O. Box 1039, Appleton, WI 54912
110. D. A. Dolenc, Gas Research Institute, 8600 West Bryn Mawr Ave., Chicago, IL 60631
111. T. Dorrell, Director, Cooperative Forestry Staff, USDA Forest Service, P.O. Box 96090, Washington, DC 20013-6090.
112. J. G. Formy-Duvall, Federal Paper Board Co., Inc., Woodlands, Box 338, Bolton, NC 28423
113. T. H. Ellis, Director, Southern Forest Experiment Station, T-10210 U.S. Postal Service Bldg., 701 Loyola Ave., New Orleans, LA 70113
114. J. Erickson, Forest Products Laboratory, 1 Gifford Pinchot Drive, Madison, WI 53705
115. R. Evers, Fast Growing Forests Group (OMNR), P.O. Box 605, Brockville, Ontario K6v 5Y8, Canada
116. A. S. Fege, USDA Forest Service, P.O. Box 2417, Washington, DC 20013
117. P. Felker, College of Agriculture, Texas A&I University, Kingsville, TX 78363
118-123. J. E. Ferrell, Biofuels and Municipal Waste Technology Division, CE 341, U.S. Department of Energy, Washington, DC 20545
124. G. J. Foley, Director, Environmental Monitoring Systems Laboratory, MD-75, Research Triangle Park, NC 27711
125. P. Fox, Bonneville Power Administration, P.O. Box 3621, Routing EPG, Portland, OR 97208
126. J. Frank, Gas Research Institute, 8600 West Bryn Mawr Ave., Chicago, IL 60631

127. M. Frank, James River of Nevada, Northwest Fiber Supply Division, 906 NW Drake Street, Camas, WA 98607
128. D. J. Frederick, School of Forest Resources, North Carolina State University, Raleigh, NC 27650
129. W. A. Geyer, Department of Forestry, Kansas State University, Manhattan, KS 66506
130. E. Glumac, Dept. of Biology, University of Houston, Houston, TX 70004
131. A. Goetzl, National Forest Products Association, 1619 Massachusetts Avenue, NW, Washington, DC 20036
132. C. R. Goldman, Professor of Limnology, Director of Tahoe Research Group, Division of Environmental Studies, University of California, Davis, CA 95616
133. J. R. Goodin, International Center for Arid and Semiarid Land Studies, P.O. Box 4620, Texas Tech University, Lubbock, TX 79409
134. D. F. Grigal, Department of Soil Science, University of Minnesota, St. Paul, MN 55108
135. M. Gunasekaran, Department of Biology, Fisk University, 1000 17th Avenut North, Nashville, TN 37203
136. R. P. Guries, Department of Forestry, University of Wisconsin, Madison, WI 53706
137. G. Gyllenborg, Western Regional Biomass Energy Program, WAPA, P. O. Box 3402, Golden, CO 80401
138. S. Hale, Energy/Development International, 1015 18th Street, NW, Suite 802, Washington, DC 20038
139. R. B. Hall, Forestry Department, 251 Bessey Hall, Iowa State University, Ames, IA 50011
140. J. W. Hanover, Department of Forestry, Michigan State University, East Lansing, MI 48824
141. E. A. Hansen, USDA Forest Service, Forestry Sciences Laboratory, P.O. Box 898, Rhinelander, WI 54501
142. G. D. Hansen, Union Camp Corp., Woodlands Research, 206 East Second Ave., Franklin, VA 23851
143. C. A. Harrington, USDA Forest Service, Southern Forest Experiment Station, P.O. box 3516, Monticello, AR 71655
144. W. Heckrodt, Kimberly Clark, W-5409 Mielke Road, Nehasha, WI 54952
145. P. E. Heilman, Western Washington Research and Extension Center, Puyallup, WA 98371
146. C. Henry, Lands and Timber Research Manager, Buckeye Cellulose Corporation, Route 3, Box 260, Perry, FL 32347
147. J. W. Huckabee, Manager, Ecological Studies Program, Electric Power Research Institute, 3412 Hillview Avenue, P.O. Box 10412, Palo Alto, CA 94303
148. J. G. Isebrands, USDA Forest Service, Forestry Sciences Laboratory, P.O. Box 898, Rhinelander, WI 54501
149. R. J. Jolley, Land, Research, and Procurement, Scott Paper Co., P.O. Box 2447, Mobile, AL 36552
150. George Y. Jordy, Director, Office of Program Analysis, Office of Energy Research, ER-30, G-226, U.S. Department of Energy, Washington, DC 20545
151. D. F. Karnosky, Department of Forestry, Michigan Technological University, Houshton, MI 49931
152. D. Klass, Institute of Gas Technology, 3424 South State Street, Chicago, IL 60616
153. F. A. Koomanoff, Director, Carbon Dioxide Research Division, Office of Energy Research, Room J-309, ER-12, U.S. Department of Energy, Washington, DC 20545

154. S. L. Krugman, USDA Forest Service, P.O. Box 2417, Room 1205, RPE, Washington, DC 20013
155. T. Ku, Agricultural Experiment Station, Department of Forestry, University of Arkansas, Monticello, AR 71655
156. S. B. Land, Jr., Department of Forestry, P.O. Drawer FR, Mississippi State University, Mississippi State, MS 39762
157. L. E. Lassen, Director, Intermountain Forest and Range Experiment Station, Forest Service Bldg., 324 25th Street, Ogden, UT 84401
158. R. Lea, School of Forest Resources, Dept. of Forestry, North Carolina State University, Raleigh, NC 27650
159. P. Lee, Shell Research Ltd., Sittingbourne Research Centre, Sittingbourne, Kent ME9 8AG, Great Britain
160. Stig Ledin, Swedish University of Agricultural Sciences, Energy Forestry Project, P. O. Box 7072, S-75007, Uppsala, Sweden
161. D. T. Lester, 3430 SE Martins Street, Portland, OR 97202
162. G. E. Likens, Director, New York Botanical Garden, Institute of Ecosystem Studies, The Mary Flagler Cary Arboretum, Box AB, Millbrook, NY 12545
163. R. A. Lindmark, Director, North Central Forest Experiment Station, 1992 Folwell Avenue, St. Paul, MN 55108
164. R. R. Loose, Office of Renewable Technology, Department of Energy, Forrestal Bldg. CE-32, 1000 Independence Avenue, S.W., Washington, DC 20585
165. D. C. Lothner, USDA Forest Service, North Central Forest Experiment Station, P.O. Box 338, 515 West First Street, Duluth, MN 55801
166. K. Luke, Scott Paper Co., P.O. Box 5869, Saraland, AL 36571
167. C. J. Mankin, Director, Oklahoma Geological Survey, The University of Oklehoma, 830 Van Vleet Oval, Room 163, Norman, OK 73019
168. Helen McCammon, Director, Ecological Research Division, Office of Health and Environmental Research, Office of Energy Research, MS-E201, ER-75, Room E-233, Department of Energy, Washington, DC 20545
169. R. McCollough, Weyerhaeuser Company, Technology Center, Tacoma, WA 98477
170. M. V. McConnell, 1023 San Luis Road, Tallahassee, FL 32304-1332
171. B. H. McCown, Department of Horticulture, University of Wisconsin, Madison, WI 53706
172. R. McKenna, Meridian Corp., 5113 Leesburg Pike, Suite 700, Falls Church, VA 22041
173. L. H. McLaren, Energy Technology Branch, U.S. Department of Energy, Oak Ridge Operations, P.O. Box 2001, Oak Ridge, TN 37831-8611
174. J. Mexal, Energy/Development International, New Mexico State University, Dept. of Agronomy & Horticulture, Las Cruces, NM 88003
175. B. Miller, National Wood Energy Association, Fred C. Hart Assoc., Inc., 1110 Vermont Ave., N.W., Suite 410, Washington, DC 20005
176. R. Miller, Mt. Jefferson Farms, P.O. Box 12395, Salem, OR 97309
177. C. P. Mitchell, Department of Forestry, University of Aberdeen, St. Machar Drive, Old Aberdeen, Scotland, AB9 2UU
178. E. A. Nelson, Westvaco, Timberlands Division, Box 458, Wickliffe, KY 42087
179. R. J. Newton, Department of Forest Science, Texas A & M University, College Station, TX 77843-2135
180. R. O. O'Connell, Coalition of Northeastern Governors, 400 North Capitol Street, Washington, DC 20001
181. J. H. Ohman, USDA Forest Service, P.O. Box 2417, Washington, DC 20013

182. William S. Osburn, Jr., Ecological Research Division, Office of Health and Environmental Research, Office of Energy Research, MS-E201, EV-33, Room F-216, Department of Energy, Washington, DC 20545
183. L. D. Ostlie, Northern States Power Company, 414 Nicollet Mall, Minneapolis, MN 55401
184. M. E. Ostry, USDA Forest Service, North Central Forest Experiment Station, 1992 Folwell Ave., St. Paul, MN 55108
185. R. Overton, USDA Forest Service, 1992 Folwell Ave., St. Paul, MN 55108
186. J. Pastor, Natural Resources Research Institute, University of Minnesota, Duluth, MN 55812
187. J. Peterson, New York State Energy Research and Development Authority, Agency Bldg. #2, Empire State Plaza, Albany, NY 12223
188. C. W. Philpot, Director, Pacific Northwest Forest and Range Experiment Station, 319 S.W. Pine Street, P.O. Box 3623, Portland, OR 97232
189. P. E. Pope, Department of Forestry and Natural Resources, Forestry Building, Purdue University, West Lafayette, IN 47907
190. Robert Rabson, Office of Basic Energy Sciences, ER-17, U.S. Department of Energy, Washington, DC 20545
191. M. K. Redenbaugh, Plant Genetics, Inc., 1930 Fifth Street, Davis, CA 95616
192. D. Rice, James River of Nevada, Northwest Fiber Supply Division, 906 NW Drake Street, Camas, WA 98607
193. D. L. Rockwood, School of Forest Resources and Conservation, 118 Newins-Ziegler Hall, University of Florida, Gainesville, FL 32611
194. G. L. Rolfe, Department of Forestry, Illinois Agricultural Experiment Station, University of Illinois, Urbana, IL 61801
195. R. Rousseau, Westvaco Corporation, Timberlands Division, P.O. Box 458, Wickliffe, KY 42087
196. G. F. Schiefelbein, Biomass Program Office, Pacific Northwest Laboratory, P. O. Box 999, Richland, WA 99352
197. L. Sennerby-Forsse. Energy Forestry Project, Swedish University of Agricultural Sciences, P. O. Box 7027, S-75007, Uppsala, Sweden
198. D. Shoup, Amana Society, Inc., Amana, IA 52203
199. B. Stanton, James River of Nevada, Northwest Fiber Supply Division, 906 NW Drake Street, Camas, WA 98607
200. K. Steinbeck, School of Forest Research, University of Georgia, Athens, GA 30602
201. R. J. Stern, Director, Office of Environmental Compliance, MS PE-25, FORRESTAL, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585
202. R. Stettler, College of Forest Resources, University of Washington, Seattle, WA 98195
203. C. H. Strauss, School of Forest Resources, Pennsylvania State University, University Park, PA 16802
204. P. H. Svanoe, Iowa Energy Policy Council, Capitol Complex, Des Moines, IA 50319
205. P. K. Takahashi, Hawaii Natural Energy Institute, 2520 Dole St., Homes Hall 206, Honolulu, HI 96822
206. C. G. Tauer, Department of Forestry, 013 South Ag. Hall, Oklahoma State University, Stillwater, OK 74078
207. B. A. Thielges, Department of Forestry, University of Kentucky, Lexington, KY 40546-0073
208. D. G. Thompson, R. D. 1, Box 670, Monroe, NY 10950

209. J. M. Vasievich, USDA Forest Service, Southeastern Forest Experiment Station, P.O. Box 12254, Research Triangle Park, NC 27709
210. C. Wallace, Biofuels and Municipal Waste Technology Division, U.S. Department of Energy, CE-341, Washington, DC 20585
211. D. K. Walter, Director, Biofuels and Municipal Waste Technology Division, CE 341, U.S. Department of Energy, Washington, DC 20585
212. Robert L. Watters, Ecological Research Division, Office of Health and Environmental Research, Office of Energy Research, MS-E201, ER-75, Room F-226, Department of Energy, Washington, DC 20545
213. A. Weaver, Carver Research Foundation, Tuskegee University, Tuskegee, AL 36088
214. Leonard H. Weinstein, Program Director of Environmental Biology, Cornell University, Boyce Thompson Institute for Plant Research, Ithaca, NY 14853
215. E. H. White, College of Environmental Science and Forestry, State University of New York, Syracuse Campus, Syracuse, NY 13210
216. C. D. Whitesell, USDA Forest Service, Pacific Southwest Forest and Range Experiment Station, 1151 Punchbowl Street, Room 323, Honolulu, HI 96813
217. J. L. Whitmore, USDA Forest Service, Timber Management Research, P. O. Box 96090, Washington, DC 20090-6090
218. Raymond G. Wilhour, Chief, Air Pollution Effects Branch, Corvallis Environmental Research Laboratory, U.S. Environmental Protection Agency, 200 SW 35th Street, Corvallis, OR 97330
219. Frank J. Wobber, Division of Ecological Research, Office of Health and Environmental Research, Office of Energy Research, MS-E201, Department of Energy, Washington, DC 20545
220. M. Gordon Wolman, The Johns Hopkins University, Department of Geography and Environmental Engineering, Baltimore, MD 21218
221. J. Wright, Alcohol Fuels Program, Solar Energy Research Institute, 1617 Cole Blvd., Golden, CO 80401
222. G. Wyckoff, The Institute of Paper Chemistry, P.O. Box 1039, Appleton, Wi 54912
223. J. I. Zerbe, USDA Forest Service, Forest Products Laboratory, P.O. Box 5130, Madison, WI 53705
224. L. Zsuffa, Faculty of Forestry, University of Toronto, Toronto, Ontario, Canada M5S 1A1
225. Office of Assistant Manager for Energy Research and Development, Oak Ridge Operations, P.O. Box 2001, U.S. Department of Energy, Oak Ridge, TN 37831-8600

226-235. Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831