

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

a25076
-A1454

EA last



United States
Department of
Agriculture

Forest Service

Bibliographies and
Literature of
Agriculture No. 10



c3

Rooting Habits of Selected Commercial Tree Species of the Eastern United States— A Bibliography

COOPER'S
ARCHIVE

SEP 23 '93

NAT'L AGRICULTURAL LIBRARY

USDA, National Agricultural Library
NAL Bldg
10301 Baltimore Blvd
Beltsville, MD 20705-2351

Rooting Habits of Selected Commercial Tree Species of the Eastern United States— A Bibliography

Compiled by

Penninah Smith and Leanne Every

Formerly, on Intergovernmental
Personnel Act assignment to the Eastern Region,
from the University of Illinois; and research
technician, Northeastern Forest Experiment
Station, respectively.

U.S. Department of Agriculture

Forest Service

Bibliographies and Literature of Agriculture No. 10

November 1980

Contents

	<i>Page</i>
Introduction	iii
Bibliography	1
Appendix	38
Key	38
Subject index	39

Acknowledgments

We would like to acknowledge Robert Blomquist, regional silviculturist, Eastern Region, Forest Service, U.S. Department of Agriculture, for conceiving and initiating this project; Dr. Irving Holland, department head of the Forestry School at the University of Illinois, for cooperation in the project that furnished office space and supplies and full library privileges; and the Forestry School faculty.

Introduction

A great variety of research has been conducted to study the rooting habits of trees. However, little of this literature has been synthesized to describe the rooting habits of particular tree species or groups of species in ways that would be useful to field foresters. The objective of this bibliography is to facilitate review of literature pertaining to rooting habits of commercially important tree species occurring in the Eastern United States, especially those that occur in the Northeast (Region 9, Forest Service, U.S. Department of Agriculture).

We have attempted to be thorough, but the result is not complete. This list focuses on the years after 1930. The literature on the genus *Pinus* has been searched more thoroughly than the other genera. Aspects of disease and mycorrhizae that do not pertain directly to root character are not emphasized. Horticultural species, for the most part, have been excluded. References to commonly planted exotic species, such as *Pinus sylvestris* L., have been included, especially when the research was conducted in the Eastern United States or the species was judged to have commercial importance there.

The entries are primarily from Biological Abstracts, Forestry Abstracts, and references cited in articles. If a paper has been abstracted in Biological or Forestry Abstracts, the abstract volume and article number are given with "FA" or "BA" at the end of the entry.

The titles of journals and publishing agencies are abbreviated according to the International List of Periodical Title Word Abbreviations (ISO 833–1974 E) of the International Organization for Standardization, with certain exceptions (e.g. the use of USDA for U.S. Dep. Agric.). Journal titles thus appear approximately as they are shown in the annual BIOSIS List of Serials (BioSciences Information Services, Philadelphia), where the full titles, CODEN symbols, countries of origin, and information about mergers, changes of title, and the like may be found.

The bibliography is arranged alphabetically by the author, and the entries are numbered consecutively. A subject index is given in the appendix. To find articles on root grafting of white pine, for example, first find the symbol for root grafting (IIIA–2) in the key to the subject index. Then turn to *Pinus strobus* in the species column of the subject index and find IIIA–2 in the subject columns. The 12 numbers listed under IIIA–2 refer to entries in the bibliography that concern white pine root grafting.

The subjects covered in the bibliography are outlined in the following list, which is the basis for the key to the subject index.

- I. Root growth and development
 - A. Form and anatomy
 - B. Relation to top growth and development
 - C. Genetic variation, within species
 - D. Periodic, seasonal
 - E. Influenced by:
 - 1. Root environment
 - a. Moisture
 - i. Drought
 - ii. Flood
 - b. Temperature
 - c. Soil
 - i. Physical aspects
 - ii. Chemical aspects
 - iii. Microrelief
 - 2. Shoot
 - a. Light
 - b. Hormones
- II. Root functions
 - A. Uptake and upward translocation
 - 1. Water
 - 2. Nutrients
 - 3. Other substances
 - B. Translocation downward
 - 1. Carbohydrate reservation
 - 2. Exudation
 - C. Respiration
 - D. Anchorage
- III. Root interactions, biological
 - A. With herbaceous and woody plants
 - 1. Spatial relations (competition for nutrients and moisture)
 - 2. (Natural) root grafting
 - 3. Soil amelioration
 - a. Exudation
 - b. Root death
 - 4. Allelopathy
 - B. With other than herbaceous and woody plants
 - 1. Symbiotic relations
 - a. Mycorrhizae
 - i. Ecto-
 - ii. Endo-
 - iii. Eclendo-
 - b. Nitrogen fixation
 - i. Leguminous
 - ii. Non-leguminous
 - 2. Pathological relationships
 - a. With undetermined or mechanical agent
 - b. With determined agent
 - i. Insect
 - ii. Nematode
 - iii. Fungus
 - iv. Bacterium
- IV. Root response to nursery and forestry practices

Bibliography

1. Abrazhko, V.I.
1969. The suction power of roots as an indicator of intensity of competition between trees and undergrowth for soil moisture [O sosushchey sile korney kak pokazatele napryazhennosti sorevnovaniya mezhdyy derev'yami i podrostom iz-za pochvennoy vlagi]. Transl., Can. Dep. Sec. State Transl. Bur., Foreign Lang. Div. *from* Bot. Zh. 53(2):254–259 (1968). FA32:339 (Transl. Dep. Fish. For. Can. No. 00FF-61).
2. Adams, W.R., Jr.
1928. Effect of spacing in a jack pine plantation. Vt. Agric. Exp. Stn. Bull. 282.
3. Adams, W.R., Jr.
1934. Studies in tolerance of New England forest trees. XI. The influence of soil temperature on the germination and development of white pine seedlings. Vt. Agric. Exp. Stn. Bull. 379.
4. Adams, W.R., and G.L. Chapman.
1941. Competition influence on the root systems of jack and Norway pines. Vt. Agric. Exp. Stn. Bull. 472. FA4:218.
5. Adams, W.T., J.H. Roberds, and B.J. Zobel.
1973. Intergenotypic interactions among families of loblolly pine. (*Pinus taeda* L.). *Theor. and Appl. Genet.* 43(7):319–322.
6. Addoms, R.M.
1946. Entrance of water into suberized roots of trees. *Plant Physiol.* 21(1):109–111. FA8:897.
7. Addoms, R.M.
1950. Notes on the structure of elongating pine roots. *Am. J. Bot.* 37(3):208–211. BA24:33816.
8. Agnihotri, V.P., and O. Vaartaja.
1967. Root exudates from red pine seedlings and their effects on *Pythium ultimum*. *Can. J. Bot.* 45(7):1031–1040. FA29:4086.
9. Ahlgren, C.E.
1958. Adventitious roots and shoots of wilding white pine at the Quetico-Superior Wilderness Research Center. *Minn. For. Notes* 70. FA20:259.
10. Ahlgren, C.E.
1959. Some effects of fire on forest reproduction in northeastern Minnesota. *J. For.* 57(3):194–200.
11. Ahlgren, C.E.
1972. Some effects of inter- and intraspecific grafting on growth and flowering of some five-needle pines. *Silvae Genet.* 21(3/4):122–126. FA34:1637.
12. Ahlgren, C.E., and H.L. Hansen.
1957. Some effects of temporary flooding on coniferous trees. *J. For.* 55(9):647–650.
13. Aikman, J.M., A.L. McComb, and G.B. Cooper.
1948. Investigation of planting procedures and cultural practices in growing trees on steep, eroded soils for post, woodlot, and wildlife purposes. *Ia. Agric. Exp. Stn. Rep.* 1948:194–195. FA11:1029.
14. Aird, P.L.
1958. The effects of herbaceous vegetation on growth of planted poplar. *Diss. Abstr.* 18(3):739–740. FA19:4166.
15. Albertson, F.W., and J.E. Weaver.
1945. Injury and death or recovery of trees in prairie climate. *Ecol. Monogr.* 15(4):393–433. BA20:9627.
16. Alexander, S.A.
1973. Root depth and percentage infection by *Fomes annosus* in a loblolly pine plantation on two soil hazard types. (Abstr.) *Phytopathology* 63(7):801. FA35:1673.
17. Alexander, S.A., and J.M. Skelly.
1974. A comparison of isolation methods for determining the incidence of *Fomes annosus* in living loblolly pine. *Eur. J. For. Pathol.* 4(1):33–38. FA35:6177.
18. Alexander, S.A., J.M. Skelly, and C.L. Morris.
1975. Edaphic factors associated with the incidence and severity of disease caused by *Fomes annosus* in loblolly pine plantations in Virginia. *Phytopathology* 65(5):585–591. FA37:391.
19. Alexandrés, S.
1977. The inhibiting effect of harmful fertilizing on root formation in poplars in different soil types. *For. Abstr.* 38(5):2131. *From* Dasika Hronika 176/177:26–34, 45 (1973).
20. Allaire, D., B. Bernier, and Y. LaFlamme.
1973. Microelement status of balsam fir in the Southern Laurentians. *Can. J. For. Res.* 3(3):379–386. BA57:54627.
21. Allen, J.C.
1950. Pine planting tests in the Copper Basin. *J. Tenn. Acad. Sci.* 25(3):199–216. FA12:2923.
22. Allen, R.M.
1969a. Contributions of tops and roots to variation in height growth of geographic sources of shortleaf pine. *Silvae Genet.* 18(1/2):38–39. BA51:45991.
23. Allen, R.M.
1969b. Racial variation in physiological characteristics of shortleaf pine roots. *Silvae Genet.* 18(1/2):40–43.
24. Allen, S.E.
1964. Nitrogen and phosphorus nutrition of loblolly pine, as shown by split-root techniques. *Agron. Abstr.* 1964:52.
25. Althen, F.W. von.
1968. Incompatibility of black walnut and red pine. *Bi-mon. Res. Notes* 24(2):19.
26. American Phytopathological Society.
1963. Symposium on root diseases of forest trees, presented at the 54th Annual Meeting of the Am. Phytopathol. Soc. [Corvallis, Oregon, Aug. 1962]. *Phytopathology* 53(10):1120–1136. BA45:44661.
27. Amos, R.E.
1962. Longevity of *Ceratocystis fagacearum* (Bretz) Hunt in the presence of other fungi in roots of deep-girdled oak-wilt trees. (Abstr.) *Phytopathology* 52(2):162. BA38:23845.
28. Amos, R.E., and R.P. True.
1967. Longevity of *Ceratocystis fagacearum* in roots of deep-girdled oak-wilt trees in West Virginia. *Phytopathology* 57(10):1012–1015. BA49:26333.
29. Anderson, C.H., and E.G. Cheyney.
1934. Root development in seedlings in relation to soil texture. *J. For.* 32(1):32–34.
30. Anderson, N.A., and G.W. Anderson.
1963. White pine root rot at the Chittenden nursery. *USDA For. Serv. Res. Note* LS-26. FA25:3734.
31. Anderson N.A., and W.M. Bugbee.
1962. *Cylindrocladium* root rot of conifer seedlings in Minnesota. (Abstr.) *Phytopathology* 52(8):721. BA41:3653.
32. Anderson, N.A., D.W. French, and D.P. Taylor.
1962. *Cylindrocladium* root rot of conifers in Minnesota. *For. Sci.* 8(4):378–382. BA42:12036.
33. Anderson, R.L., and M. Berbee.
1976. Development of ectomycorrhizae on yellow birch from the Eveleth Nursery, Minnesota. *USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep.* S-18-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
34. Anderson, R.L., and D. Mosher.
1976. Abundance of ectomycorrhizae on red pine in Michigan State Nurseries. *USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep.* S-19-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
35. Anderson, R.L., and L.J. Wlazik.
1976a. Comparison of development of ectomycorrhizae on 1–4 red pine seedlings from Toumey Minnesota National Forest Nursery and adjacent land. *USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep.* S-20-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
36. Anderson, R.L., and L.J. Wlazik.
1976b. Ectomycorrhizae on four year-old red pine seedlings from Eveleth Nursery, Minnesota. *USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep.* S-9-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.

37. Anderson, R.L., and L.J. Wlazik.
1976c. Occurrence of ectomycorrhizal fungus on white spruce at Eveleth and Toumey USFS Nurseries. USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep. S-16-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
38. Anderson, R.L., J.E. Borkenhagen, and L.J. Wlazik.
1976a. Comparison of ectomycorrhizae occurrence on pruned and unpruned roots on 3-0 red pine seedlings at Hayward State Nursery, Hayward, Wisconsin, 1976. USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep. S-17-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
39. Anderson, R.L., S.V. Krupa, P.R. Laidly, and E. Stewart.
1976b. Evaluation of ectomycorrhizae on red pine seedlings at Toumey and Eveleth National Forest Nurseries in the Lake States. USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep. S-14-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
40. Anderson, R.L., D. Mosher, and G.R. Ellis.
1976c. Endomycorrhizae development on black walnut seedlings from the Southern Michigan State Nursery. USDA For. Serv. For. Insect and Dis. Manage. Eval. Rep. S-10-76, Northeast. Area, State and Priv. For., Upper Darby, Pa.
41. Andresen, J.W.
1959. A study of pseudo-nanism in *Pinus rigida* Mill. Ecol. Monogr. 29(4):309-332.
42. Andrews, L.K.
1941. Effects of certain soil treatments on the development of loblolly pine nursery stock. J. For. 39(11):918-921. FA3:285.
43. Arend, J.L.
1948. Influences on red-cedar distribution in the Ozarks. USDA For. Serv. Note 58, South. For. Exp. Stn., New Orleans, La.
44. Arend, J.L.
1950. Influence of fire and soil on distribution of eastern red-cedar in the Ozarks. J. For. 48(2):129-130.
45. Armson, K.A.
1970. Soils, roots, and foresters. In Tree growth and forest soils. C.T. Youngberg, and C.B. Davey, eds., 3rd North Am. For. Soils Conf. Proc., N.C. State Univ. Raleigh, [August 1968], p. 513-522.
46. Armson, K.A.
1972. Distribution of conifer seedling roots in a nursery soil. For. Chron. 48(3):141-143. FA34:152.
47. Armson, K.A., and W.S. Millward.
1970. A study of aeration of roots of two-year black spruce and one-year jack pine. Rep. Res. For. Bot. Glendon Hall Fac. For. Univ. Toronto 1969/70:3. FA33(2):2217.
48. Armson, K.A., and S.R. Shea.
1970. Effect of soil texture on physical impedance of root growth. Rep. Res. For. Bot. Glendon Hall Fac. For. Univ. Toronto 1969/70:4. FA33(2):2218.
49. Armson, K.A., and H. Struik.
1968. The effect of oxygen levels in the growth of black spruce and red pine seedlings. Rep. Res. For. Bot. Glendon Hall Fac. For. Univ. Toronto 1967/68:4. FA31(1):338.
50. Armson, K.A., and R. Van Den Driessche.
1959. Natural root grafts in red pine (*Pinus resinosa* Ait.). For. Chron. 35(3):232-241. BA35:11536.
51. Armson, K.A., and J.R.M. Williams.
1960. The root development of red pine (*Pinus resinosa* Ait.) seedlings in relation to various soil conditions. For. Chron. 36(1):14-17. BA35:64597.
52. Armstrong, W.
1968. Oxygen diffusion from the roots of woody species. Physiol. Plant. 21(3):539-543. BA49:123943.
53. Armstrong, W., and D.J. Read.
1972. Some observations on oxygen transport in conifer seedlings. New Phytol. 71:55-62.
54. Arnett, J.D., Jr., and W. Witcher.
1974. Infection sites of *Fusarium solani* on yellow poplar. Plant Dis. Rep. 58(8):754-757. FA36:2117.
55. Artman, J.D.
1974. Greenhouse screening of loblolly pine of known parentage for resistance to *Fomes annosus*. Plant Dis. Rep. 58(5):409-411. FA35:7695.
56. Artman, J.D., and E.L. Sharp.
1971. An inoculation test using *Peniphora gigantea* on stumps of eastern white pine. Plant Dis. Rep. 55(9):834-836. FA33:4672.
57. Ashby, W.C.
1960. Seedling growth and water uptake by *Tilia americana* at several root temperatures. Bot. Gaz. 121(4):228-233. BA36:18456.
58. Ashby, W.C.
1962. Root growth in American basswood. Ecology 43(2):336-339. BA39:24626.
59. Ashby, W.C., and J.N. Cummins.
1968. Root growth and rooting of basswood. Bot. Gaz. 129(4):327-333. BA50:100479.
60. Ashe, W.W.
1915. Loblolly or North Carolina pine. N.C. Geol. and Econ. Surv. Bull. 24.
61. Baker, F.S.
1918. Aspen reproduction in relation to management. J. For. 16:389-398.
62. Baker, F.S.
1925. Aspen in the Central Rocky Mountain Region. USDA Dep. Bull. 1291.
63. Baker, J.B.
1977. Tolerance of planted hardwoods to spring flooding. South. J. Appl. For. 1(3):23-25. BA65:8852.
64. Baker, J.B., and B.G. Blackmon.
1974. Biomass and nitrogen accumulation in a cottonwood plantation. Agron. Abstr. 1974:174.
65. Balatinecz, J.J., D.F. Forward, and R.G.S. Bidwell.
1966. Distribution of photoassimilated C¹⁴O₂ in young jack pine seedlings. Can. J. Bot. 44(3):362-364. FA28:139.
66. Baldwin, H.I.
1954. Needle blight in eastern white pine. Plant Dis. Rep. 38(10):725-727. FA16:3240.
67. Bannan, M.W.
1940. The root systems of Northern Ontario conifers growing in sand. Am. J. Bot. 27(2):108-114. BA14:9933.
68. Bannan, M.W.
1941a. Variability in wood structure in roots of native Ontario conifers. Bull. Torrey Bot. Cl. 68(3):173-194. BA15:13216.
69. Bannan, M.W.
1941b. Vascular rays and adventitious root formation in *Thuja occidentalis* L. Am. J. Bot. 28(6):457-463. BA15:19299.
70. Bannan, M.W.
1941c. Wood structure of *Thuja occidentalis*. Bot. Gaz. 103:295-309.
71. Bannan, M.W.
1942. Notes on the origin of adventitious roots in the native Ontario conifers. Am. J. Bot. 29(8):593-598. BA17:2517.
72. Bard, G.E.
1946. The mineral nutrient content of the foliage of forest trees on three soil types of varying limestone content. Proc. Soil Sci. Soc. Am. 10:419-422.
73. Barham, R.O., D.H. Marx, and J.L. Ruehle.
1974. Infection of ectomycorrhizal and nonmycorrhizal roots of shortleaf pine by nematodes and *Phytophthora cinnamomi*. Phytopathology 64(9):1260-1264. BA59:22142.

74. Barker, K.R., and G.D. Griffin.
1965. The distribution of nematodes in jack and red pine plantations and the parasitism of *Xiphinema americanum* on jack pine. *Nematologica* 11(1):33-34. FA27:2570.
75. Barnard, E.L., and J.R. Jorgensen.
1977. Respiration of field-grown loblolly pine roots as influenced by temperature and root type. *Can. J. Bot.* 55(6):740-743.
76. Barnes, B.V.
1959. Natural variation and clonal development of *Populus tremuloides* and *P. grandidentata* in Northern Lower Michigan. *Diss. Abstr.* 20(5):1511-1512.
77. Barnes, B.V.
1966. The clonal growth habit of American aspens. *Ecology* 47(3):439-447.
78. Barnes, R.L.
1958. Studies on physiology of isolated pine roots and root callus cultures. *Diss. Abstr.* 19(3):417-418. BA33:23431.
79. Barnes, R.L., and A.W. Naylor.
1959a. Effect of various nitrogen sources on growth of isolated roots of *Pinus serotina*. *Physiol. Plant.* 12(1):82-89. BA33:38899.
80. Barnes, R.L., and A.W. Naylor.
1959b. *In vitro* culture of pine roots and the use of *Pinus serotina* roots in metabolic studies. *For. Sci.* 5(2):158-168. BA33:46884.
81. Barnes, R.L., and A.W. Naylor.
1959c. Studies on the ornithine cycle in roots and callus tissues of *Pinus serotina* and *Pinus clausa*. *Bot. Gaz.* 121(2):63-69. BA35:54068.
82. Barney, C.W.
1951. Effects of soil temperature and light intensity on root growth of loblolly pine seedlings. *Plant Physiol.* 26(1):146-163. BA25:25250.
83. Barykina, R.P.
1958. Osobennosti obrazovaniya kornevykh otrpyoskov u beloi akatsii (*Robinia pseudoacacia* L.). [Features of the formation of suckers in *R. pseudoacacia*.] *Byul. Mosk. O-va Ispy. Prir. Otd. Biol.* 63(4):57-71. *Ref. Zhur., Biol.* 1959, No. 66578 (Transl.). BA47:119058, FA22:4324.
84. Basham, J.T.
1966. Heart rot of jack pine in Ontario. I. The occurrence of basidiomycetes and microfungi in defective and normal heartwood of living jack pine. *Can. J. Bot.* 44(3):275-295. FA28:802.
85. Basham, J.T.
1973. Heart rot of black spruce in Ontario. I. Stem rot, hidden rot and management considerations. *Can. J. For. Res.* 3(1):95-104. FA35:876.
86. Baskerville, G.L.
1966. Dry-matter production in immature balsam fir stands: Roots, lesser vegetation, and total stand. *For. Sci.* 12(1): 49-53. FA27:5605.
87. Bassett, J.R.
1962. Soil moisture and loblolly pine growth relations on a perched water table site in Southeast Arkansas. *Diss. Abstr.* 22(7):2136. FA23:4875.
88. Bates, C.G.
1926. Some relations of plant ecology to silvicultural practice. *Ecology* 7(4):469-480.
89. Batra, L.R.
1974. *Armillaria mellea* on flowering dogwood (*Cornus florida*). *Plant Dis. Rep.* 58(8):719-721. FA36:3415.
90. Baxter, D.V.
1937. Development and succession of forest fungi and diseases in forest plantations. *Mich. Univ. Sch. For. Conserv. Circ.* 1.
91. Baxter, P., and D. West.
1977a. The flow of water into fruit trees. I. Resistances to water flow through roots and stems. *Ann. Appl. Biol.* 87 (1):95-101.
92. Baxter, P., and D. West.
1977b. The flow of water into fruit trees. II. Water intake through a cut limb. *Ann. Appl. Biol.* 87(1):103-112.
93. Baxter, S.S.
1958. Subsurface problems of trees and utility structures. *Trees Mag., Ohio* 19(1):7-8. FA20:3199.
94. Beattie, D.
1976. A layman's introduction to mycorrhizae. U.S. Gov. Print. Off. 1976-641-313/5151.
95. Beaufait, W.R.
1955. Soil profile observations relating to drouth damage in black willow stands. *J. For.* 53(7):517.
96. Becking, J.H.
1961. A requirement of molybdenum for the symbiotic nitrogen fixation in alder (*Alnus glutinosa* Gaertn.). *Plant and Soil* 15(3):217-227. FA23:3298.
97. Becking, J.H.
1970. Plant-endophyte symbiosis in non-leguminous plants. *Plant and Soil* 32(3):611-654. FA32:323.
98. Beckman, C.H., and J.E. Kuntz.
1951. Translocation of poisons, dyes, and radioiodine, and its relation to oak wilt. (Abstr.) *Phytopathology* 41(1):2-3. FA12:3388.
99. Beefink, H.H.
1951. Some observations on tamarack or eastern larch (*Larix laricina* DuRoi (Koch)) in Alberta. *For. Chron.* 27(1):38-39.
100. Bega, R.V.
1962. Tree killing by *Fomes annosus* in a genetics arboretum. *Plant Dis. Rep.* 46(2):107-110.
101. Bega, R.V.
1963. *Fomes annosus*. In *Symposium of root diseases of forest trees. Invitational papers presented August 27, 1962, at the 54th Annual Meeting of the American Phytopathological Society at Corvallis, Oregon.* *Phytopathology* 53(10):1120-1123.
102. Beineke, W.F.
1967. Genetic variation in the ability to withstand transplanting shock in loblolly pine (*Pinus taeda* L.). *Diss. Abstr. Int.* 27B(12, part 1):4197. FA29:1897.
103. Bell, D.T.
1975. Germination of *Quercus alba* L. following flood conditions. *Ill. Agric. Exp. Stn. For. Res. Rep.* 75-2.
104. Bell, D.T., and F.L. Johnson.
1974. Flood-caused tree mortality around Illinois reservoirs. *Trans. Ill. State Acad. Sci.* 67(1):28-37.
105. Bellefeuille, R.
1935. La reproduction des peuplements d'épinette noire dans les forêts du Nord-Québec. [The reproduction of the populations of black spruce in the forests of Northern Quebec.]. *For. Chron.* 11(4):323-340. [Engl. summ.]
106. Bendana, F.E.
1964. Effects of nodules on geotropism of roots. *Diss. Abstr.* 24(7):2663-2664. FA25:4652.
107. Bergdahl, D.R., and D.W. French.
1976. Needle droop: an abiotic disease of plantation red pine. *Plant Dis. Rep.* 60(6):472-476. FA38:932.
108. Bergman, F., and B. Haggstrom.
1976. Some important facts considering planting with rooted forest plants. *Transl. by R.A. Hellenius. For. Chron.* 52(6):266-273. *from Saetr. ur Sver. Skogsvardsforbunds Tidskr.* 6 (1973).
109. Berndt, H.W., and R.D. Gibbons.
1958. Root distribution of some native trees and understory plants growing on three sites within ponderosa pine watersheds in Colorado. *USDA For. Serv., Rocky Mtn. For. and Range Exp. Stn., Fort Collins, Colo., Stn. Pap.* 37.
110. Berry, C.R., and D.H. Marx.
1976. Sewage sludge and *Pisolithus tinctorius* ectomycorrhizae: Their effect on growth of pine seedlings. *For. Sci.* 22(3):351-358.
111. Berry, C.R., and D.H. Marx.
1977. Growth of loblolly pine seedlings in strip-mined kaolin spoil as influenced by sewage sludge. *J. Environ. Qual.* 6(4):379-381.

112. Berry, F.H.
1968. Spread of *Fomes annosus* root rot in thinned shortleaf pine plantations. USDA For. Serv. Res. Note NE-87. FA31:6667.
113. Berry, F.H., and T.W. Bretz.
1963. Attempts to transmit the oak-wilt fungus by soil and root inoculations. Plant Dis. Rep. 47(3):164. FA25:3759.
114. Beslow, D.T., E. Hacskeylo, and J.H. Melhuish, Jr.
1970. Effects of environment on beaded root development in red maple. Bull. Torrey Bot. Club 97(5):248-252. BA52:28116.
115. Bey, C.F., and R.E. Phares.
[n.d. Circa 1969]. Seasonal growth pattern for five sources of black walnut. Cent. States For. Tree Improv. Conf. Proc. 6:44-47.
116. Beyer, L.E., and R.J. Hutnik.
1969. Acid and aluminum toxicity as related to strip-mine spoil banks in western Pennsylvania. Pa. State Univ. Res. Briefs 3:69-72.
117. Bibelriether, H.
1967. Root development of some tree species in relation to soil properties [Die Bewurzelung einiger Baumarten in Abhängigkeit von Bodeneigenschaften]. Transl., Can. Dep. Sec. State Transl. Bur., Foreign Lang. Div., from Allg. Forstz. 21/47:808-815 (1966). FA29:292 (Transl. Dep. For. Can. 95).
118. Bilan, M.V.
1960. Root development of loblolly pine seedlings in modified environments. Stephen F. Austin State Coll., Nacogdoches, Tex., Dep. For. Bull. 4. FA22:255.
119. Bilan, M.V.
1962. Effect of planting date on regeneration and development of roots of loblolly pine seedlings. 13th Int. Union For. Res. Organ. Congr. Proc., [Vienna 1961], Part 2(1), Section 22-15. FA24:273.
120. Bilan, M.V.
1965. Initial root growth in loblolly pine. (Abstr.) Bull. Ecol. Soc. Am. 46(3):94. FA27:3558.
121. Bilan, M.V.
1966. Low temperature as a limiting factor of root growth in loblolly pine seedlings. (Abstr.) Bull. Ecol. Soc. Am. 47(3):103. FA29:1945.
122. Bilan, M.V.
1967a. Effect of low temperature on root elongation in loblolly pine seedlings. 14th Int. Union For. Res. Organ. Congr. Proc., [Munich 1967], Part IV, Section 23, p. 74-82. FA29:2004.
123. Bilan, M.V.
1967b. Growth and development of root system in loblolly pine during the first season of growth. J. For. 65(3):224.
124. Bilan, M.V.
1968. Effects of physical soil environment on growth and development of root systems in southern pines. In Forest fertilization, theory and practice. [Papers presented at the Symp. on For. Fert., April 1967, Gainesville, Fla.], Tenn. Val. Auth. Natl. Fert. Dev. Cent., Muscle Shoals, Ala., p. 15-19.
125. Bilan, M.V.
1971. Some aspects of tree root distribution. In Mycorrhizae, E. Hacskeylo, ed., 1st North Am. Conf. on Mycorrhizae, Univ. Ill., Urbana, April 1969. USDA For. Serv. Misc. Publ. 1189, p. 69-80.
126. Bilan, M.V., and S.W. Jan.
1968. Needle moisture content as indicator of cessation of root elongation in loblolly pine seedlings. (Abstr.) Bull. Ecol. Soc. Am. 49(3):109. FA30:2007.
127. Bilan, M.V., and J.J. Stransky.
1966. Pine seedling survival and growth response to soils of the Texas post-oak belt. Stephen F. Austin State Coll., Nacogdoches, Tex., Dep. For. Bull. 12.
128. Biswell, H.H.
1935. Effects of environment upon the root habits of certain deciduous forest trees. Bot. Gaz. 96(4):676-708. BA10:2694.
129. Bjallovich, Ju.P.
1968. [*Taxodium distichum* in Samarkand, and the mystery of its pneumatophores.] Lesoved. Mosk. 1:87-91. FA30:2009. [Engl. summ.]
130. Blakeslee, G.M.
1975. Basidiospore germination and function in ectomycorrhizal synthesis by certain members of the Agaricales. Diss. Abstr. Int. 36B(6):2550-2551. FA37:6015.
131. Blaser, R.E.
1976. Plants and de-icing salts. Am. Nurseryman 144(12):8-9, 48, 50, 52-53.
132. Bloomberg, W.J.
1963. The significance of initial adventitious roots in poplar cuttings and the effect of certain factors on their development. For. Chron. 39(3):279-289.
133. Boerker, R.H.
1916. Ecological investigations upon the germination and early growth of forest trees. Nebr. Univ., Univ. Stud. 16(1-2):1-89.
134. Boisen, A.T., and J.A. Newlin.
1910. The commercial hickories. USDA For. Serv. Bull. 80.
135. Bond, G.
1954. The formation and function of some non-legume root nodules. In 8th Int. Bot. Congr., [Paris 1954], Part 10, Section 21, p. 14. FA16:230.
136. Bond, G.
1956. Evidence for fixation of nitrogen by root nodules of alder (*Alnus*) under field conditions. New Phytol. 55(2):147-153. FA18:3780.
137. Bond, G.
1958. Symbiotic nitrogen fixation by non-legumes. In Nutrition of legumes. E.G. Hallsworth, ed., Univ. Nottingham 5th Easter Schl. Agric. Sci., Butterworths Sci. Publ., London 1958, p. 216.
138. Bond, G.
1967. Fixation of nitrogen by higher plants other than legumes. Annu. Rev. Plant Physiol. 18:107-126.
139. Bond, G.
1976. The results of the IBP survey of root-nodule formation in non-leguminous angiosperms. In Symbiotic nitrogen fixation in plants. P.S. Nutman, ed., Int. Biol. Programme 7, Cambridge Univ. Press, p. 443-474.
140. Bond, G., and E.J. Hewitt.
1962. Cobalt and the fixation of nitrogen by root nodules of *Alnus* and *Casuarina*. Nature (Lond.) 195(4836):94-95. FA24:257.
141. Bond, G., and E.J. Hewitt.
1967. The significance of copper for nitrogen fixation in nodulated *Alnus* and *Casuarina* plants. Plant and Soil 27(3):447-449. FA29:3555.
142. Bond, G. and J.T. MacConnell.
1955. Nitrogen fixation in detached non-legume root nodules. Nature (Lond.) 176(4482):606. FA17:223.
143. Bond, G., and G.D. Scott.
1955. An examination of some symbiotic systems for fixation of nitrogen. Ann. Bot. (N.S.) 19(73):67-77.
144. Bond, G., W.W. Fletcher, and T.P. Ferguson.
1954. The development and function of the root nodules of *Alnus*, *Myrica*, and *Hippophae*. Plant and Soil 5(4):309-323. FA16:2762.
145. Bond, J.J.
1972. Mycorrhizal fungi of oak in North Carolina and their influence on uptake of potassium by oak seedlings. Diss. Abstr. Int. 32B(12):6770. FA35:6726.
146. Bormann, F.H.
1954. Ecological implications of size and weight changes in *Pinus taeda* L. seedlings during the first growing season. (Abstr.) Bull. Ecol. Soc. Am. 35(3):59-60. FA16:1523.

147. Bormann, F.H.
1961a. Intraspecific root grafts and transport. *In* Recent advances in botany, 9th Int. Bot. Congr., [Montreal 1959], 2:40-41. BA37:3466.
148. Bormann, F.H.
1961b. Intraspecific root grafting and the survival of eastern white pine stumps. *For. Sci.* 7(3):247-256. BA37:7344.
149. Bormann, F.H.
1966. The structure, function, and ecological significance of root grafts in *Pinus strobus* L. *Ecol. Monogr.* 36(1):1-26. BA47:50490.
150. Bormann, F.H., and B.F. Graham, Jr.
1959. The occurrence of natural root grafting in eastern white pine, *Pinus strobus* L., and its ecological implications. *Ecology* 40(4):677-691. BA35:9450.
151. Bormann, F.H., and B.F. Graham, Jr.
1960. Translocation of silvicides through root grafts. *J. For.* 58(5):402-403. BA35:48995.
152. Bormann, F.H., and B.F. Graham, Jr.
1961. A study of intraspecific root grafts in white pine, *Pinus strobus* L., by means of radioisotopes and dyes. *In* Recent advances in botany, 9th Int. Bot. Congr., [Montreal 1959], 2:1375-1377.
153. Boullard, B.
1959. A propos des mycorrhizes du *Pinus strobus* L. [Concerning the mycorrhizae of *Pinus strobus* L.] *Bull. Trimest. Soc. Mycol. Fr.* 75(2):194-200. FA21:2853.
154. Boullard, B., and T. Dominik.
1958. Badania porownawcze nad mikoryzami *Pinus strobus* L. z roznych stanowick we Francji i w Polsce. [Investigations on mycorrhizae of *P. strobus* L. at different sites in France and Poland.] *Pr. Inst. badarv. Lesn.* 178, p. 45-84. FA20:4267. [Fr., Russ., and Ger. summ.]
155. Boullard, B., and H.A. Ferchau.
1962. Endotrophic mycorrhizae of plants collected in some Eastern American and Canadian white pine communities. *Phyton* 19(1):65-71. FA24:4747.
156. Bourdeau, P.
1954. Oak seedling ecology determining segregation of species in Piedmont oak-hickory forests. *Ecol. Monogr.* 24(3):297-320.
157. Box, B.H.
1968. A study of root extension and biomass in a six year old pine plantation in Southeast Louisiana. *Diss. Abstr.* 28B(9):3545-3546. FA30:342.
158. Boyce, J.S., Jr.
1959. Root rot in pine plantations. *For. Farmer* 19(3):8,17-18.
159. Boyce, J.S., Jr.
1960. Distribution of *Ceratocystis fagacearum* in roots of wilt-infected oaks in North Carolina. *Phytopathology* 50 (10):775-776. BA36:15509.
160. Boyce, J.S., Jr.
1962a. *Fomes annosus* in white pine in North Carolina. *J. For.* 60(8):553-557. FA24:2287.
161. Boyce, J.S., Jr.
1962b. Greenhouse inoculations of coniferous seedlings with *Fomes annosus*. (Abstr.) *Phytopathology* 52(1):4. FA23:5420.
162. Boyce, J.S., Jr.
1966. Sporulation by *Peniophora gigantea* with reference to control of Annosus root rot. [*Fomes annosus*] *For. Sci.* 12(1):2-7. FA27:6204.
163. Boyer, W.D., R.M. Romancier, and C.W. Ralston.
1971. Root respiration rates of four tree species grown in the field. *For. Sci.* 17(4):492-493. BA54:16554.
164. Braun, E.L.
1936. Notes on root behavior of certain trees and shrubs of the Illinoian till plain of Southwestern Ohio. *Ohio J. Sci.* 36(3):141-146. BA11:5412.
165. Braun, H.J.
1969. Root germs in young and older stems of *Populus*. *Transl. Dep. Fish. For. Can. OOFF-69. Transl. from Z. Bot., Stuttgart*, 1963, 51(5):441-451. FA26:1744.
166. Braun, H.J., and J. Lulev.
1969. [Infection of intact, finger-thick spruce roots by *Fomes annosus*. I. The structure of the surface periderm, and first infection results.] *Forstwiss. Centralbl.* 88(6):327-338. FA32:2718. [In Ger. with Engl. summ.]
167. Braun, H.J., and J. Lulev.
1970. [Infection of intact, finger-thick spruce roots by *Fomes annosus*. II. Infection paths and the spread of the fungus immediately after infection.] *Forstwiss. Centralbl.* 89(5):269-275. FA32:2719. [In. Ger. with Engl. summ.]
168. Brender, E.V.
1955. Drought damage to pines. *For. Farmer* 14(10):7,15. FA17:513.
169. Bretz, T.W.
1951. Oak wilt. *J. For.* 49(3):169-171.
170. Brewer, C.W., and N.E. Linnartz.
1976. Loblolly pine root distribution influenced by physical properties of soil. *Agron. Abstr.* 1976:182.
171. Briggs, A.H.
1939. Report of planting experiment to determine the effect of root exposure on deciduous planting stock. *J. For.* 37(12):939-943. BA15:13410.
172. Brix, H.
1960. Determination of viability of loblolly pine seedlings after wilting. *Bot. Gaz.* 121(4):220-223. FA23:4874.
173. Broadfoot, W.M.
1973. Water table depth and growth of young cottonwood. *USDA For. Serv. Res. Note* SO-167. FA35:7447.
174. Broadfoot, W.M., and H.L. Williston.
1973. Flooding effects on southern forests. *J. For.* 71(9):584-587.
175. Brooks, M.G.
1951. Effect of black walnut trees and their products on other vegetation. *W. Va. Agric. Exp. Stn. Bull.* 347.
176. Brown, A.B.
1935. Cambial activity, root habit and sucker shoot development in two species of poplar. *New Phytol.* 34(3):163-179. BA10:16893.
177. Brown, A.H.F., A. Carlisle, and E.J. White.
1966. Some aspects of the nutrition of Scots pine on peat. *In* Physiology in forestry. *Rep. Soc. Forest. G. B. 6th Discuss. Meet., [Edinburgh, Scotland 7-9 January 1966]*, p. 78-87.
178. Brown, C.L., and P.P. Kormanik.
1967. Suppressed buds on lateral roots of *Liquidambar styraciflua*. *Bot. Gaz.* 128(3/4):208-211. BA49:52908.
179. Brown, James Harold.
1968. Patterns of variation in root systems of Scotch pine provenances. *Diss. Abstr.* 28B(9):3546-3547.
180. Brown, J.H.
1969. Variations in roots of greenhouse grown seedlings of different Scotch pine provenances. *Silvae Genet.* 18(4):111-117. BA51:57739.
181. Brown, J.H., and F.C. Cech.
1972. Top and root characteristics of greenhouse grown seedlings of different black cherry provenances. *Silvae Genet.* 21(3/4):130-133. BA56:8145.
182. Brown, James Henry, Jr.
1965. A study of root distribution in two hardwood stands in the Duke Forest. *Ph.D. thesis, Duke Univ., Durham, N.C. (Diss. Abstr.* 26(2):593.)
183. Brown, J.H., Jr., and T.G. Bourn.
1973. Patterns of soil moisture depletion in a mixed oak stand. *For. Sci.* 19(1):23-30. FA35:80.
184. Brown, J.H., Jr., and F.W. Woods.
1968. Root extension of trees in surface soils of the North Carolina Piedmont. *Bot. Gaz.* 129(2):126-132. BA50:50059.

185. Brown, W.G.E., and D.S. Lacate.
1961. Rooting habits of white and red pine. Can. For. Res. Branch Tech. Note 108. FA23:1708.
186. Bryan, W.C., and P.P. Kormanik.
1977. Mycorrhizae benefit survival and growth of sweetgum seedlings in the nursery. South. J. Appl. For. 1(1):21-23.
187. Bryan, W.C., and J.L. Ruehle.
1976. Growth stimulation of sweetgum seedlings induced by the endomycorrhizal fungus *Glomus mosseae*. Tree Plant. Notes 27(2):9,14.
188. Bryan, W.C., and B. Zak.
1961. Synthetic culture of mycorrhizae of southern pines. For. Sci. 7(2):123-129. FA23:1703.
189. Bryan, W.C., and B. Zak.
1962. Additional synthesis of mycorrhizae on shortleaf and loblolly pines. For. Sci. 8(4):384. FA24:3365.
190. Buckman, R.E., and L.H. Blankenship.
1965. Repeated spring prescribed burning reduces abundance and vigor of aspen root suckering. J. For. 63(1):23-25. BA46:40688.
191. Buell, M.F., and H.F. Buell.
1959. Aspen invasion of prairie. Bull. Torrey Bot. Club 86(4):264-265.
192. Bugbee, W.M.
1962. Host range and bioassay of field soil for *Cylindrocladium scoparium*. (Abstr.) Phytopathology 52(8):726. BA41:3666.
193. Buijtenen, J.P. van.
1966. Testing loblolly pines for drought resistance. Tex. For. Serv. Tech. Rep. 13.
194. Buijtenen, J.P. van, M.V. Bilan, and R.H. Zimmerman.
1976. Morpho-physiological characteristics related to drought resistance in *Pinus taeda*. In Tree physiology and yield improvement. M.G.R. Cannell, and F.T. Last, eds., Academic Press, N.Y., p. 349-359.
195. Bunger, M.T., and H.J. Thomson.
1938. Root development as a factor in the success or failure of windbreak trees in the southern high plains. J. For. 36(8):790-803. BA14:9291.
196. Burger, H.
1930. Bodenveränderung und wurzelbildung. Schweiz. Z. Forstwes. 2:67-71.
197. Burns, G.P.
1914. Studies in tolerance of New England forest trees. I. Development of white pine seedlings in nursery beds. Vt. Agric. Exp. Stn. Bull. 178, p. 125-144.
198. Burns, G.P.
1937. Studies in tolerance of New England forest trees. XIII. The effect of root development on height and diameter growth. Vt. Agric. Exp. Stn. Bull. 422.
199. Burton, J.D.
1971. Prolonged flooding inhibits growth of loblolly pine seedlings. USDA For. Serv. Res. Note SO-124.
200. Busgen, M., and E. Munch.
1929. The structure and life of forest trees. 3rd ed., Transl. from Ger. by T. Thomson. John Wiley and Sons, Inc., N.Y.
201. Bushey, D.J.
1937. Root extension of shade trees. Natl. Shade Tree Conf. Proc. 13:22-30.
202. Bushey, D.J.
1946. Regeneration of the root systems of pin oak (*Quercus palustris*) and American elm (*Ulmus americana*) following transplanting in the fall and spring. Natl. Shade Tree Conf. Proc. 22:46-56. BA21:20594.
203. Cabrera, H., and F.W. Woods.
1975. Effects of root deformation upon early growth of loblolly pine (*Pinus taeda* L.) Tenn. Farm and Home Sci. Progr. Rep. 93, p. 28-30. FA37:276.
204. Calderone, R.A., and R.P. True.
1967. Pathogenicity and physiology of *Pythium vexans*. (Abstr.) Phytopathology 57(8):806. FA30:2491.
205. Campana, R.J.
1953. *Corticium galactinum* and white pine needle blight. (Abstr.) Phytopathology 43(9): 468. FA15:1620.
206. Campana, R.J.
1954. *Corticium galactinum* does not cause white pine needle blight. Plant Dis. Rep. 38(4):297-303. FA15:1620.
207. Campbell, W.A.
1967. *Phytophthora* spp.: *Phytophthora* spp., particularly *P. cactorum* (Lebert and Cohn) Schroet., *P. cinnamomi* Rands, and *P. lateralis* Tucker and Milbrath. In Important forest insects and diseases of mutual concern to Canada, the United States, and Mexico. A.G. Davidson, and R.M. Prentice, eds., Can. For. Serv. Publ. 1180, p. 57-60.
208. Campbell, W.A., and J.H. Miller.
1952. Windthrow of root-rotted oak shade trees. Plant Dis. Rep. 36(12):490. BA28:6934.
209. Canada Department of Agriculture.
1953. Deterioration of birch. Can. Dep. Agric. Entomol. Br., Annu. Rep. For. Insect and Dis. Surv. 1953, p. 81. FA16:739.
210. Cannon, W.A.
1949. A tentative classification of root systems. Ecology 30(4):542-548.
211. Cannon, W.A.
1954. A note on the grouping of lateral roots. Ecology 35(2): 293-295. FA15:3350.
212. Capps, S.R.
1931. Glaciation in Alaska. U.S. Geol. Surv. Prof. Pap. 170-A.
213. Carleton, L.C.
1963. Salt tolerances of *Pinus thunbergii*, *P. radiata*, *P. resinosa* and *P. taeda*. Diss. Abstr. 23(9):3090-3091. FA25:272.
214. Carlson, L.W.
1976. Root initiation of lodgepole pine and white spruce seedlings grown under varying light conditions. Bi-mon. Res. Notes 32(4):21-22.
215. Carlson, L.W.
1977. The effect of defoliation on conifer seedling root initiation. Bi-mon. Res. Notes 33(1):1.
216. Carlson, L.W., and F. Endean.
1976. The effect of rooting volume and container configuration on the early growth of white spruce (*Picea glauca*) seedlings. Can. J. For. Res. 6(2): 221-224.
217. Carlson, L.W., and L.D. Nairn.
1977. Root deformities in some container-grown jack pine in south-eastern Manitoba. For. Chron. 53(3):147-149.
218. Carlson, M.C.
1950. Nodal adventitious roots in willow stems of different ages. Am. J. Bot. 37(7):555-561. BA25:8855.
219. Carlson, W.C.
1974. Root initiation induced by root pruning in northern red oak. In Forestry research review—1974, Ohio Agric. Res. and Devel. Cent., Wooster, p. 14-16.
220. Carpenter, I.W., and A.T. Guard.
1954. Anatomy and morphology of the seedling roots of four species of the genus *Quercus*. J. For. 52(4):269-274. FA15:3252.
221. Carrodus, B.B.
1967. Absorption of nitrogen by mycorrhizal roots of beech. II. Ammonium and nitrate as sources of nitrogen. New Phytol. 66(1):1-4. BA48:51595.
222. Carter, J.C.
1941. Preliminary investigation of oak diseases in Illinois. III. Nat. Hist. Surv. Bull. 21:195-230.
223. Chadwick, L.C.
1936. Ohio shade tree fertilization experiments. Natl. Shade Tree Conf. Proc. 12:55-66.

224. Chadwick, L.C.
1939. The distribution of roots of Moline elms in relationship to fertilizer application. Natl. Shade Tree Conf. Proc. 15:38-51.
225. Chadwick, L.C., D. Bushey, and G. Pletcher.
1937. Root distribution studies. Proc. Am. Soc. Hort. Sci. 35:734-738. BA12:8741.
226. Chandler, R.F., Jr.
1941. The amount and mineral nutrient content of freshly fallen leaf litter in the hardwood forests of central New York. J. Am. Soc. Agron. 33(10): 859-871. FA3:284.
227. Chapman, A.G.
1935. The effects of black locust on associated species with special reference to forest trees. Ecol. Monogr. 5:37-60.
228. Cheyney, E.G.
1928. The root system of the hazel. J. For. 26(8):1046-1047. BA4:22320.
229. Cheyney, E.G.
1929. A study of the roots in a square yard of jack pine forest. J. For. 27(5):546-549. BA5:2041.
230. Cheyney, E.G.
1932. The roots of a jack pine tree. J. For. 30(8):929-932.
231. Childs, T.W.
1937. Variability of *Polyporus schweinitzii* in culture. Phytopathology 27(1):29-50.
232. Chouinard, L.
1959. Sur l'existence d'un centre quiescent au niveau de l'apex radicaire juvénile de *Pinus banksiana* Lamb. [On the existence of a quiescent center in the root apical meristem of *P. banksiana*.] Laval Univ. For. Res. Found. Contr. 4, p. 27-31.
233. Christensen, C.M.
1938. Root rot of pines caused by *Armillaria mellea*. (Abstr.) Phytopathology 28(1):5.
234. Chung, H.H., and P.J. Kramer.
1975. Absorption of water and ³²P through suberized and unsuberized roots of loblolly pine. Can. J. For. Res. 5(2): 229-235. BA60:48892.
235. Clark, F.B.
1969. Factors affecting the production of fibrous roots on black walnut seedlings. Diss. Abstr. 29B(7):2252. FA30:5595.
236. Clark, F.B., and C.K. Losche.
1969. Importance of the A horizon in hardwood seedling establishment. J. For. 67(7):504-505. BA51:11139.
237. Clark, J.
1961. Birch dieback. In recent advances in botany, 9th Int. Bot. Congr., [Montreal 1959], 2:1551-1555.
238. Clements, F.E., J.E. Weaver, and H.C. Hanson.
1929. Plant competition: An analysis of community functions. Carnegie Inst. Wash. Publ. 398.
239. Cleveland, T.E., H.E. Garrett, and H.G. Hedrick.
1976a. Characterization of associative soil fungi with mycorrhizae on loblolly pine and white oak seedlings. (Abstr.) Proc. La. Acad. Sci. 39:109.
240. Cleveland, T.E., H.E. Garrett, and H.G. Hedrick.
1976b. Effects of SO₂ and O₃ on colony growth of *Pisolithus tinctorius*—a mycorrhizal isolate on loblolly pine and white oak seedlings. (Abstr.) Proc. La. Acad. Sci. 39:108.
241. Cleveland, T.E., H.E. Garrett, and H.G. Hedrick.
1976c. Effects of SO₂ and O₃ on colony growth of selected associative soil fungi with root surface mycorrhizae on loblolly pine and white oak seedlings. (Abstr.) Proc. La. Acad. Sci. 39:108-109.
242. Cleveland, T.E., H.E. Garrett, and H.G. Hedrick.
1976d. Effects of SO₂ and O₃ on sporulation of selected associative soil fungi with mycorrhizae on loblolly pine and white oak seedlings. (Abstr.) Proc. La. Acad. Sci. 39:109.
243. Cobb, F.W., Jr., and W.W. Wilcox.
1967. Comparison of susceptibility of *Abies concolor* and *Pinus ponderosa* wood to decay by *Fomes annosus*. Phytopathology 57(12):1312-1314. FA29:4106.
244. Coile, T.S.
1937. Distribution of forest tree roots in North Carolina Piedmont Soils. J. For. 35(3):247-257.
245. Coile, T.S.
1940. Soil changes associated with loblolly pine succession on abandoned agricultural land of the Piedmont Plateau. Duke Univ. Sch. For. Bull. 5.
246. Coleman, E.
1945. Strange root formation in weeping willow (*Salix babylonica*). Victorian Nat. 62(7):121. BA20:11082.
247. Commonwealth Bureau of Horticultural and Plantation Crops.
1965. Bibliography on the ion-exchange capacity of roots. Com-momr. Bur. Hort. Plant Crops, East Malling, Eng. FA27:137.
248. Connola, D.P., and E.C. Wixson.
1963a. Effects of soil and other environmental conditions on white pine weevil attack in New York. J. For. 61(6): 447-448. FA25:1012.
249. Connola, D.P., and E.C. Wixson.
1963b. White pine weevil attack in relation to soils and other environmental factors in New York. Bull. N.Y. State Museum and Sci. Serv. 389, Albany.
250. Conway, V.M.
1940. Aeration and plant growth in wet soils. Bot. Rev. 6(4):149-163.
251. Cook, D.B.
1961. Shoestring fungus and planted larch on cutover land. J. For. 59(11):824-826. FA23:3828.
252. Cook, D.B., and D.S. Welch.
1957. Backflash damage to residual stands incident to chemipeeling. J. For. 55(4):265-267. FA18:4109.
253. Cooper, W.S.
1911. Reproduction by layering among conifers. Bot. Gaz. 52(5):369-379.
254. Copeland, O.L., Jr.
1952. Root mortality of shortleaf and loblolly pine in relation to soils and littleleaf disease. J. For. 50(1): 21-25. FA13:3191.
255. Copeland, O.L., Jr., and R.G. McAlpine.
1962. Soil characteristics associated with spot die-out in loblolly pine plantations. For. Sci. 8(1):12-15. FA23:5631.
256. Cordell, C.E.
1973. *Cylindrocladium* root rot of black walnut and yellow-poplar nursery seedlings. In Southeast. U.S. Abstr. Pap., 2nd Int. Congr. Plant Pathol. 0689, Minneapolis. FA36:3407.
257. Cordell, C.E., and D.H. Marx.
1977. Mycorrhizae + tree seedlings = increased southern timber production. South. Lumberman, June 1, 1977.
258. Cordell, C.E., and S.J. Rowan.
1975. *Cylindrocladium scoparium* infection in a natural sweetgum stand. Plant Dis. Rep. 59(10):775-776. FA37:2988.
259. Cordell, C.E., W.J. Stambaugh, C.E. Affeltranger, and J.L. Knighten.
1970. Rhododendron and mountain laurel, new hosts of *Fomes annosus* in western North Carolina. Plant Dis. Rep. 54(7):560. FA32:2726.
260. Corovic, M., and L. Stjepanovic.
1958. Rastenje korena i korenskih dlakakod biljaka *Pinus nigra* L. i *Robinia pseudoacacia* L. na razlicitim temperaturama pod loge. [The growth of roots and root-hairs of *P. nigra* and *R. pseudoacacia* at different substratum temperatures.] Sumarstve 11(5/6):305-314. FA20:1551.

261. Corte, A.
1969. Recherche sull 'influenza dell' infezione micorrizica sullo sviluppo vegetativo, sulla vigoria e sullo stato sanitario di tre specie di pino. I. Risultati preliminari sul comportamento delle piantine in vivaio e nel primo anno di coltura in campo. [The influence of infection with mycorrhizae on the growth, vigour and health of three pine species. I. Preliminary results, on the behavior of plants in the nursery and during the first year in the field.] Arch. Bot. e Biogeogr. Ital. Modena 45(1/2):1-28. [Engl. summ.] FA31:4376.
262. Coultas, C.L.
1973. Response of pine seedlings to manipulations of the spodic horizon. Proc. Soil and Crop Sci. Soc. Fla. 32:121-125. FA38:3251.
263. Coutts, M.P., and W. Armstrong.
1976. Role of oxygen transport in the tolerance of trees to waterlogging. In Tree physiology and yield improvement. M.G.R. Cannell, and F.T. Last, eds., Academic Press, N.Y. p. 361-385.
264. Cox, R.S.
1951. A preliminary report on etiological and control studies of damping-off and root-rot in the conifer seedbed in Delaware. Plant Dis. Rep. 35(8):374-378. FA13:2070.
265. Cox, R.S.
1953. Etiology and control of a serious complex of diseases of conifer seedlings. (Abstr.) Phytopathology 43(9):469. FA15:1292.
266. Cox, R.S.
1954. *Cylindrocladium scoparium* on conifer seedlings. Univ. Del. Agric. Exp. Stn. (Tech.) Bull. 301.
267. Cox, T.L.
1972. Relationships of metabolic activity and mineral content to surface phenomena of four diameter classes of *Liriodendron* roots. Agron. Abstr. 1972:138.
268. Cox, T.L.
1973. Production, mortality and nutrient cycling in root systems of *Liriodendron* seedlings. Diss. Abstr. Int. 33B(11):5245-5246. FA36:2483.
269. Cox, T.L.
1975. Seasonal respiration rates of yellow-poplar roots by diameter classes. For. Sci. 21(2):185-188. BA60:48914.
270. Coyne, J.F.
1968. Simulated Nantucket pine tip moth attacks reduce root development of shortleaf pine seedlings. J. Econ. Entomol. 61(1):319-320. BA49:69827.
271. Crandall, B.S.
1938. A root and collar disease of pine seedlings caused by *Sphaeropsis ellisii*. Phytopathology 28(3):227-229.
272. Crandall, B.S., G.F. Gravatt, and M.M. Ryan.
1945. Root disease of *Castanea* species and some coniferous and broadleaf nursery stocks, caused by *Phytophthora cinnamomi*. Phytopathology 35(3):162-180. FA7:99.
273. Crawford, R.M.M., and M.A. Baines.
1977. Tolerance of anoxia and the metabolism of ethanol in tree roots. New Phytol. 79:519-526.
274. Crossley, D.I.
1940. The effect of a compact subsoil horizon on root penetration. J. For. 38(10):794-796. FA2:293.
275. Cummings, W.H.
1942. Exposure of roots of shortleaf pine stock. J. For. 40(6):490-492.
276. Curtis, J.D.
1944. Northern white-cedar on upland soils in Maine. J. For. 42(10):756-759.
277. Cuthbert, R.A., W.N. Cannon, Jr., and J.W. Peacock.
1975. Relative importance of root grafts and bark beetles to the spread of Dutch elm disease. USDA For. Serv. Res. Note NE-206. FA37:3003.
278. Daft, M.J., and E. Hacskeylo.
1977. Growth of endomycorrhizal and nonmycorrhizal red maple seedlings in sand and anthracite spoil. For. Sci. 23(2):207-216.
279. Daft, M.J., E. Hacskeylo, and T.H. Nicolson.
1975. Arbuscular mycorrhizae in plants colonizing coal spoils in Scotland and Pennsylvania. In Endomycorrhizas. F.E. Sander, B. Mosse, and P.B. Tinker, eds., Academic Press, London, p. 561-580. FA37:6013.
280. Dale, J., A.L. McComb, and W.E. Loomis.
1955. Chlorosis, mycorrhizae and the growth of pines on a high-lime soil. For. Sci. 1(2):148-157. FA17:218.
281. Daly, G.T.
1966. Nitrogen fixation by nodulated *Alnus rugosa* NS. Can. J. Bot. 44(12):1607-1621.
282. Dandeno, J.B.
1909. Mutual interaction of plant roots. Mich. Acad. Sci. Annu. Rep. 11:24-25.
283. Danielson, R.M., and C.B. Davey.
1969. Microbial recolonization of a fumigated nursery soil. For. Sci. 15(4):368-380. FA31:4367.
284. Davey, C.B., and W.A. Bland.
1970. Nutrient accumulation patterns of loblolly pine (*Pinus taeda* L.) seedlings in nursery seedbeds. Agron. Abstr. 1970:158.
285. Davidson, D.W.
1963. Living stumps of *Tsuga canadensis* (L.) Carr. (hemlock) in northern New Jersey. Bull. Torrey Bot. Club 90(3):204-207. FA25:291.
286. Davidson, D.W., and R.M. Davis
1964. Further observations on living stumps of *Tsuga canadensis* (L.) Carr. (hemlock) in northern New Jersey. Bull. Torrey Bot. Club 91(3):233-234. FA26:1903.
287. Davidson, H.
1970. The effect of root system and depth of planting on the survival and growth of Scots pine when planted in a highway right-of-way. Tree Plant. Notes 21(2):26-27.
288. Davidson, R.W., and R.F. Patton.
1961. *Paxillus atroamentosus* causes brown root rot in dead jack pine in plantations in Wisconsin. Plant Dis. Rep. 45(11): 836-838. FA24:2294.
289. Davies, G.
1973. Response of loblolly pine (*Pinus taeda* L.) seedlings from two seed sources to favorable and unfavorable moisture regimes. M.S. Thesis, Stephen F. Austin State Univ., Nacogdoches, Tex.
290. Davis, D.E.
1959. Some effects of calcium deficiency on the anatomy of *Pinus taeda*. Am. J. Bot. 36(3):276-282.
291. Davis, E.F.
1928. The toxic principle of *Juglans nigra* as identified with synthetic juglone, and its toxic effects on tomato and alfalfa plants. (Abstr.) Am. J. Bot. 15(10, suppl.):620.
292. Davis, J.B., and R.L. Barnes.
1973. Effects of soil-applied fluoride and lead on growth of loblolly pine and red maple. Environ. Pollut. 5(1):35-44. FA36:4805.
293. Davis, S.H.
1942. *Sclerotium bataticola* a cause of damping-off in seedling conifers. Science 95:70. FA4:55.
294. Dawson, J.O.
1978. Nitrogen fixation, photosynthesis and early growth of *Alnus glutinosa*. Ph.D. Thesis, Ia. State Univ., Ames.
295. Day, M.W.
1941. The root system of red pine saplings. J. For. 39(5):468-472. BA15:24271.
296. Day, M.W.
1944. The root system of aspen. Am. Midl. Nat. 32(2):502-509. BA19:2203.

297. Day, M.W.
1945. A comparison of the root systems of jack pine and tamarack. *J. For.* 43(1):41-42. BA19:17332.
298. Day, M.W., and F.H. Vogel.
1944. Silviculture and utilization of balsam poplar. *J. For.* 42(7):512-514.
299. Day, R.J., and G.R. MacGillivray.
1975. Root regeneration of fall-lifted white spruce nursery stock in relation to soil moisture content. *For. Chron.* 51(5):196-199. FA37:4395.
300. Day, R.J., J.P. Stupendick, and J.M. Butler.
1976. Root periodicity and root regeneration potential are keys to successful plantation establishment. *In Ont. Minist. of Nat. Resour.—Great Lakes For. Res. Cent., Plant. Establ. Symp.* FA39:396.
301. Day, W.R.
1950. The drought-crack of conifers. *In 25th Imperial For. Inst. Rep., Oxford, 1948-9*, p. 12-13. FA11:3245.
302. Dean, G.W.
1927. Rate of autumnal root growth in white pine. Unpubl. ms., Yale Univ. Sch. For.
303. DeByle, N.V.
1962. Tracing and evaluating functional root connections among stems within aspen clones. *Diss. Abstr.* 23(1):9-10. FA24:1871.
304. DeByle, N.V.
1964. Detection of functional intraclonal aspen root connections by tracers and excavation. *For. Sci.* 10(4):386-396. BA46:26946.
305. DeByle, N.V., and I.C.M. Place.
1959. Rooting habits of oak and pine on Plainfield sand in Central Wisconsin. *Univ. Wis. For. Res. Notes* 44.
306. DeGruchy, J.H.B.
1956. Water fluctuations as a factor in the life of six of the higher plants of Central Oklahoma. *Proc. Okla. Acad. Sci.* 37:45-46.
307. DeMent, J.A., and E.L. Stone.
1968. Influence of soil and site on red pine plantations in New York. II. Soil type and physical properties. *Cornell Univ. Agric. Exp. Stn. Bull.* 1020, Ithaca, N.Y.
308. Denne, M.P.
1972. A comparison of root- and shoot-wood development in conifer seedlings. *Ann. Bot. (N.S.)* 36(146):579-587. BA54:68795.
309. DenUyl, D.
1961. Some observations on bald cypress in Indiana. *Ecology* 42(4):841-843. FA23:3306.
310. Denyer, W.B.G.
1960. Cultural studies of *Flammula alnicola* (Fr.) Kummer and *Flammula conissans* (Fr.) Gillet. *Can. J. Bot.* 38(6):909-920.
311. Denyer, W.B.G., and C.G. Riley.
1964. Dieback and mortality of tamarack caused by high water. *For. Chron.* 40(3):334-338. FA26:2316.
312. Detwiler, S.B.
1916. The bald cypress (*Taxodium distichum*): Identification and characteristics. *Am. For.* 22(274):577-581.
313. Dhillon, P.S., W.R. Byrnes, and C. Merritt.
1967. Simazine and phosphorus interactions in red pine seedlings. *Weeds* 15(4):339-343. FA30:760.
314. Dickson, R.E., T.C. Broyer, and C.M. Johnson.
1972. Nutrient uptake by tupelo gum and bald cypress from saturated or unsaturated soil. *Plant and Soil* 37(2):297-308. BA55:30917.
315. Dickson, R.E., J.F. Hosner, and N.W. Hosley.
1965. The effects of four water regimes upon the growth of four bottomland tree species. *For. Sci.* 11(3):299-305.
316. Diebold, C.H.
1933. Root distribution and penetration of soil layers. *J. For.* 31(4):481-482.
317. Dimpleby, G.W.
1953. Natural regeneration of pine and birch on the heather moors of North-east Yorkshire. *Forestry* 26:41-52.
318. Dirr, M.A.
1974. Tolerance of honeylocust seedlings to soil-applied salt. *Hort-Science* 9(1):53-54. FA36:4023.
319. Dirr, M.A.
1976. Selection of trees for tolerance to salt injury. *J. Arboric.* 2(11):209-216.
320. DiSanzo, C.P., and R.A. Rohde.
1969. *Xiphinema americanum* associated with maple decline in Massachusetts. *Phytopathology* 59(3):279-284.
321. Dittmer, H.J.
1949. Root hair variations in plant species. *Am. J. Bot.* 36(2):152-154.
322. Doak, K.D.
1934a. Cortical parasitism of conifer-seedling roots in pure culture by mycorrhizal and non-mycorrhizal fungi. (Abstr.) *Phytopathology* 24:6-7.
323. Doak, K.D.
1934b. Fungi that produce ectotrophic mycorrhizae of conifers. (Abstr.) *Phytopathology* 24:7.
324. Doak, K.D.
1934c. Mycorrhizae and their relation to shade trees. *Natl. Shade Tree Conf. Proc.* 10:99-105. BA11:203.
325. Doak, K.D.
1955a. Pine root reaction in sterile culture to mycorrhizal and other fungi. *Am. Midl. Nat.* 54(2):443-451. FA18:2596.
326. Doak, K.D.
1955b. Mineral nutrition and mycorrhizal association of bur oak. *Lloydia* 18(3):101-108.
327. Dochinger, L.S.
1967. *Leptographium* root decline of eastern white pine. (Abstr.) *Phytopathology* 57(8):809. FA30:2544.
328. Dosser, R.C., and R.R. Hicks, Jr.
1975. Ortet and season of collection significantly affect rooting of river birch stem cuttings. *Tree Plant. Notes* 26(2):11-12.
329. Drake, C.R., J.E. Kuntz, and A.J. Riker.
1957. Chemical control of the oak wilt. *Univ. Wis. For. Res. Note* 35. FA19:3170.
330. Dreisinger, B.R., D.V. Baxter, and S.H. Spurr.
1956. Decline of red pine on heavy loam soils. *Mich. For.* 14. FA18:702.
331. Drobnov, P.P., and L.S. Savel'eva.
1973. [Morphological changes in the stem and roots of *Robinia pseudoacacia* in shelterbelts choked with an accumulation of dust.] *Byul. VNII agrolesomelior* 12(66):37-39. [In Russ. with Engl. summ.] FA36:282.
332. Dullaart, J.
1970. The auxin content of root nodules and roots of *Alnus glutinosa* (L.) Vill. *J. Exp. Bot.* 21(69):975-984. FA32:3942.
333. Dumbroff, E.B., and D.C.W. Brown.
1976. Cytokinin and inhibitor activity in roots and stems of sugar maple seedlings through the dormant season. *Can. J. Bot.* 54(3/4):191-197. BA62:4781.
334. Dumbroff, E.B., and D.P. Webb.
1978. Physiological characteristics of sugar maple and implications for successful planting. *For. Chron.* 54(2): 92-95.
335. Duncan, W.H.
1935. Root systems of woody plants of old fields of Indiana. *Ecology* 16(4):554-567. BA10:20371.
336. Duncan, W.H.
1941. A study of root development in three soil types in the Duke Forest. *Ecol. Monogr.* 11(2):141-164. BA15:21213.
337. Dunning, D.
1946. Roots of forest trees. A selected list of references. *USDA For. Serv. Res. Note* 52, Pac. Southwest For. and Range Exp. Stn. FA9:775.

338. Dykeman, W.R., and A.S. deSousa.
1966. Natural mechanisms of copper tolerance in a copper swamp forest. *Can. J. Bot.* 44:871-878.
339. Edmonds, A.S., J.M. Wilson, and J.L. Harley.
1976. Factors affecting potassium uptake and loss by beech mycorrhiza. *New Phytol.* 76(2):307-315. BA62:13866.
340. Egger, A.
1975. [*Otiorrhynchus ovatus*, a serious pest of nurseries and young plantations.] *Allg. Forstztg.* 85(1):7-11. [In Ger.] FA35:5375.
341. Eghbaltalab, M., G. Gay, and G. Bruchet.
1975. [Antagonism between 15 species of basidiomycetes and three pathogenic fungi of tree roots.] *Bull. Mens. Soc. Linn. de Lyon.* 44(7):203-208. [In Fr.] FA37:5915.
342. Einspahr, D.W.
1971. Growth and nutrient uptake of aspen hybrids using sand culture techniques. *Silvae Genet.* 20(4):132-137. BA54:25658.
343. Eis, S.
1970. Root-growth relationships of juvenile white spruce, alpine fir, and lodgepole pine on three soils in the interior of British Columbia. *Can. For. Serv. Publ.* 1276. FA32:5633.
344. Eis, S.
1977. Root forms in habitats with heavy shrub competition. *Bi-mon. Res. Notes* 33(4):27-29.
345. Elder, W.C., and J.E. Webster.
1959. Food reserves in post oak stumps and roots. *Okla. Agric. Exp. Stn. Tech. Bull.* T-80. BA35:30202.
346. Eliason, E.J.
1928. Comparative virulence of certain strains of *Pythium* in direct inoculation of conifers. *Phytopathology* 18:361-367.
347. Eliason, E.J.
1938. Buckwheat as a factor in the root rot of conifers. (Abstr.) *Phytopathology* 28:7.
348. Eliasson, L.
1961. The influence of growth substances on the formation of shoots from aspen roots. *Physiol. Plant.* 14(1):150-156. BA36:45925.
349. Emerson, F.W.
1921. Subterranean organs of bog plants. *Bot. Gaz.* 72-359-374.
350. Enescu, V.
1960. Influenta provenientei (saminta, lastari, drajoni) si a virstei asupra sistemului de inradacinare al salcimului. [The influence of origin (seed, coppice shoots, root suckers) and age, on the root system of *Robinia pseudoacacia*.] *Rev. Padurilor* 75(7):396-399. FA22:4323.
351. Engler, A.
1903. Untersuchungen über das Wurzelwachstum der Holzarten. *Mitt. Schwiez. Centralanst. Forstl. Versuchswes.* 7:247-272.
352. Enright, L.J.
1959. Growth response of rooted cuttings of pine and spruce. *J. For.* 57(7):509-510. BA34:8585.
353. Ewan, H.E., and R.J. Finnegan.
1967. Pine root-collar weevil *Hylobius radialis* Buch. In Important forest insects and diseases of mutual concern to Canada, the United States, and Mexico. A.G. Davidson, and R.M. Prentice, eds., *Can. For. Serv. Publ.* 1180, p. 111-114.
354. Fabricius, L.
1905. Untersuchungen über den Stärke- und Fettgehalt der Fichte auf der oberbayerischen Hochebene. *Naturw. Zeit. Land-u. Forstw.* 3:137-176.
355. Farmer, R.E., Jr.
1962a. Aspen root sucker formation and apical dominance. *For. Sci.* 8(4):403-410. BA42:11643.
356. Farmer, R.E., Jr.
1962b. Depth and diameter of the parent roots of aspen root suckers. *Mich. For.* 23. FA24:1869.
357. Farmer, R.E., Jr.
1962c. Some physiological aspects of root sucker initiation and early growth in *Populus tremuloides* and *P. grandidentata*. *Diss. Abstr.* 23(1):10. FA24:1870.
358. Farmer, R.E., Jr.
1970. Variation and inheritance of eastern cottonwood growth and wood properties under two soil moisture regimes. *Silvae Genet.* 19(1):5-8. FA31:5950.
359. Farmer, R.E., Jr.
1975. Dormancy and root regeneration of northern red oak. *Can. J. For. Res.* 5(2):176-185. BA60:48873.
360. Farrar, J.L.
1953. Distribution of radiophosphorus in red pine seedlings. *Can. For. Branch Silv. Leaflet.* 78. FA15:3242.
361. Farrar, J.L., and G.D. Huntly.
1969. The effect of root pruning on root extension growth of *Pinus banksiana* and *Picea glauca* seedlings. *Rep. Res. For. Bot. Glendon Hall Fac. For. Univ. Toronto* 1968/69:5-6. FA31:6287.
362. Farrell, E.P., and A.L. Leaf.
1974. Effects of fertilization and irrigation on root numbers in a red pine plantation. *Can. J. For. Res.* 4(3):366-371. BA59:1960.
363. Fassi, B., and A. Fontana.
1966. Ricerche sulle micorrizze ectotrofiche del pino strobo in vivaio. II. Micorrizze di *Thelephora terrestris* Ehrh. ex Fries, di *Laccaria laccata* (Scop.) Berk. et Br. e di *Hebeloma mesophaeum* Pers. ex Fries. [Researches on ectotrophic mycorrhizae of *Pinus strobus* in nurseries. II. Mycorrhizae of *T. terrestris*, of *L. laccata*, and of *H. mesophaeum*.] *Allionia* 12:47-53. [Engl. summ.] FA29:1988.
364. Fassi, B., and A. Fontana.
1969. Sintesi micorrizica tra *Pinus strobus* e *Tuber maculatum*. II. Sviluppo dei semenzali trapiantati e produzione di ascocarpi. [Mycorrhizal synthesis between *Pinus strobus* and *Tuber maculatum*. II. Development of transplanted seedlings and production of ascocarps.] *Allionia* 15:115-120. [Engl. summ.] FA32:2205.
365. Fassi, B., and M. Palenzona.
1969. Sintesi micorrizica tra *Pinus strobus*, *Pseudotsuga douglasii* ed *Endogene lactiflua*. [Mycorrhizal associations of *Endogene lactiflua* with *Pinus strobus* and *Pseudotsuga menziesii*.] *Allionia* 15:105-114. [Engl. summ.] FA32:2204.
366. Fassi, B., and E. de Vecchi.
1962. Ricerche sulle micorrizze ectotrofiche de pino strobo in vivaio. I. Descrizione di alcune forme piu diffuse in Piemonte. [Researches in ectotrophic mycorrhizae of *Pinus strobus* in nurseries. I. Description of some of the most common forms in Piedmont.] *Allionia* 8:133-152. [Engl. summ.] FA24:4748.
367. Fassi, B., G. Bressy, and T.M.C. Diallo.
1969a. The effect of substrate and fungicides on damping-off of *Pinus strobus* and on root development. *Phytopathol. Mediterr., Bologna* 8(1):28-40. [In Fr. with Fr., Ital., and Engl. summ.] FA31:2754.
368. Fassi, B., C. Diallo, and M. Palenzona.
1969b. Root rot of *Pinus strobus* caused by *Phytophthora cactorum*. *Ann. Phytopathol. Paris* 1(Spec No.):187-192. [In Ital. with Fr. summ.] FA31:4773.
369. Fassi, B., A. Fontana, and J.M. Trappe.
1969c. Ectomycorrhizae formed by *Endogene lactiflua* with species of *Pinus* and *Pseudotsuga*. *Mycologia* 61:412-413. FA31:2179.
370. Faulkner, M.E., and D.C. Malcolm.
1972. Soil physical factors affecting root morphology and stability of Scots pine on upland heaths. *Forestry* 45(1):23-36. BA54:60261.
371. Fayle, D.C.F.
1964. Layering habit of sugar maple. *For. Chron.* 40(1): 116-121.
372. Fayle, D.C.F.
1965. Rooting habit of sugar maple and yellow birch. *Can. Dep. For. Publ.* 1120. BA47:94198.

373. Fayle, D.C.F.
1966. Root sucker origin on bitternut hickory. Bi-mon. Res. Notes 22(4):2.
374. Fayle, D.C.F.
1968a. Patterns of radial growth in tree roots. Diss. Abstr. 28B(10):4017. FA30:1342.
375. Fayle, D.C.F.
1968b. Radial growth in tree roots: Distribution, timing, anatomy. Univ. Toronto Fac. For. Tech. Rep. 9. BA50:116891.
376. Fayle, D.C.F.
1975a. Archy and diameter of primary xylem in horizontal and vertical roots of red pine. Can. J. For. Res. 5(1):122-129. BA60:9592.
377. Fayle, D.C.F.
1975b. Distribution of radial growth during the development of red pine root systems. Can. J. For. Res. 5(4):608-625.
378. Fayle, D.C.F.
1975c. Extension and longitudinal growth during the development of red pine root systems. Can. J. For. Res. 5(1):109-121. FA36:6137.
379. Fayle, D.C.F.
1976. Stem sway affects ring width and compression wood formation in exposed root bases. For. Sci. 22(2):193-194.
380. Fayle, D.C.F.
1978. Poor vertical root development may contribute to suppression in a red pine plantation. For. Chron. 54(1):99-103.
381. Fayle, D.C.F., and G. Pierpoint.
1975. Evolvement of root and shoot systems of red pine on soils of different moisture availability. In Forest soils and forest land management. B. Bernier and C.H. Winget, eds., 4th North Am. For. Soils Conf. Proc., Laval Univ., 1973, Press l'Univ. Laval, Quebec, p. 11-25.
382. Fegel, A.C.
1941. Comparative anatomy and varying physical properties of trunk, branch and root wood in certain northeastern trees. Bull. N.Y. State Coll. For. Syracuse Univ., Tech. Publ. 55.
383. Fenton, R.H.
1955. Windthrow a hazard in Virginia pine strip cuttings. USDA For. Serv. Res. Note 53, Northeast. For. Exp. Stn.
384. Fenton, R.H.
1965. Root grafts and translocation of 2, 4, 5-T in young sweetgum stands. J. For. 63(1):16-18. BA46:40689.
385. Fessenden, R.J., R.O. Waito, and R.C. Gregory.
1973. Copper toxicity of jack pine seedlings. Agron. Abstr. 1973:138.
386. Feucht, J.R.
1962. Root initiation and development in air-layered pine and spruce. Diss. Abstr. 23(1):15-16. BA41:3626.
387. Fisher, P.L.
1941. Germination reduction and radicle decay of conifers caused by certain fungi. J. Agric. Res. 62:87-95.
388. Fisher, R.F., Jr.
1969. Increased availability of nitrogen and phosphorus in the root zone of conifers. Diss. Abstr. 29B(11):3993. FA31:2167.
389. Fisher, R.F., Jr., and E.L. Stone.
1968. Soil and plant moisture relations of red pine growing on a shallow soil. Proc. Soil Sci. Soc. Am. 32(5):725-728.
390. Fisher, R.F., Jr., and E.L. Stone.
1969. Increased availability of nitrogen and phosphorus in the root zone of conifers. Proc. Soil Sci. Soc. Am. 33(6):955-961. BA51:63443.
391. Foil, R.R.
1965. The effects of compaction on soil characteristics and seedling growth. Diss. Abstr. 26(6):2955. FA27:5223.
392. Foil, R.R., and C.W. Ralston.
1967. The establishment and growth of loblolly pine seedlings on compacted soils. Proc. Soil Sci. Soc. Am. 31(4):565-568.
393. Fontana, A., and M., Palenzona.
1969. Sintesi micorrizica di *Tuber albidum* in coltura pura, con *Pinus strobus* e pioppo Euroamericano. [Mycorrhizal synthesis of *T. albidum* in pure culture, on *P. strobus* and Euroamerican poplar.] Allionia 15:99-104. [Engl. summ.] FA32:2206.
394. Forbes, R.D.
1925. The roots of trees. Am. For. 31:201-204,234,236.
395. Fortin, J.A.
1970. Interaction entre Basidiomycetes mycorrhizateurs et racines de pine en presence d'acide indol-3yl-acetique. [The interaction between mycorrhiza-forming Basidiomycetes and pine roots in the presence of IAA.] Physiol. Plant. 23(2):365-371. FA31:6072.
396. Foster, N.W., and I.K. Morrison.
1976. Distribution and cycling of nutrients in a natural *Pinus banksiana* ecosystem. Ecology 57(1):110-120.
397. Fowler, R.F.
1970. The white grub in Upper Michigan and northern Wisconsin 1-2 year old red pine plantations: Population-damage correlation, high-grub-hazard area identification and chemical application techniques. Diss. Abstr. Int. 31B(3):989. FA33:1160.
398. Fowler, R.F., and L.F. Wilson.
1971. White grub populations, *Phyllophaga* spp., in relation to damaged red pine seedlings in Michigan and Wisconsin plantations (Coleoptera: Scarabaeidae). Mich. Entomol. 4(1):23-28. FA34:3000.
399. Fowler, R.F., and L.F. Wilson.
1974. Injury to aldrin-treated and untreated red pine by white grubs (Coleoptera: Scarabaeidae) and other agents during first five years after planting. Great Lakes Entomol. 7(3):81-88. FA37:6903.
400. Fraser, A.I.
1962. The soil and roots as factors in tree stability. Forestry 35(2):117-127. FA24:3804.
401. Fraser, A.I.
1966. Current Forestry Commission root investigations. In Physiology in forestry. Soc. For. G.B. 6th Discuss. Meet. Rep., [Edinburgh, 7-9 January 1966], p. 89-93. BA47:104249.
402. Fraser, D.A., and D. McGuire.
1969. Total growth of a black spruce (*Picea mariana*) tree at Chalk River, Ontario, Canada. Can. J. Bot. 47(1):73-84. BA50:77996.
403. Freeman, F.W.
1963. Factors affecting the differential tolerance of tree species to herbicides, primarily simazine. Diss. Abstr. 24(2):456-457. FA25:2322.
404. Froelich, R.C., E.G. Kuhlman, C.S. Hodges, M.J. Weiss, and J.D. Nichols.
1977. *Fomes annosus* root rot in the South: Guidelines for prevention. USDA For. Serv., August 1977, South. For. Exp. Stn., Southeast. For. Exp. Stn., and Southeast. Area, State and Priv. For.
405. Föelich, H.J., and W. Dietze.
1970. Untersuchungen über Wurzelentwicklung an Pflanzen der Gattung *Populus*, Sektionen Aigeiros, Leuce and Tacamahaca. [Studies on the root development on plants of the genus *Populus*, sections Aigeiros, Leuce and Tacamahaca.] Silvae Genet. 19(4):131-142. [Engl. summ.] BA52:118666.
406. Frothingham, E.H.
1914. White pine under forest management. USDA Bull. 13.
407. Frothingham, E.H.
1915. The eastern hemlock. (*Tsuga canadensis* (Linn.) Carr.). USDA Bull. 152.
408. Fuller, G.D.
1913. Reproduction by layering in the black spruce. Bot. Gaz. 55:452-457.

409. Funk, D.T.
1971. Pot size, pot shape and soil mix all influence black walnut seedling growth. *Plant Propagator* 17(1):10-14.
410. Gabriel, W.J.
1975. Allelopathic effects of black walnut on white birches. *J. For.* 73(4):234-237. FA37:168.
411. Gager, C.S.
1929. Aeration of tree roots—theory. *Natl. Shade Tree Conf. Proc.* 5:26-27. BA6:6585.
412. Gaiser, R.N.
1947. The growth of loblolly and pond pine seedlings under differing conditions of soil flooding. Unpubl. ms., Dep. Bot., Duke Univ., Durham, N.C.
413. Gaiser, R.N.
1952. Root channels and roots in forest soils. *Proc. Soil Sci. Soc. Am.* 16(1):62-65. BA26:35837.
414. Gaiser, R.N., and J.R. Campbell.
1951. The concentration of roots in the white oak forests of southeastern Ohio. *USDA For. Serv. Tech. Pap.* 120, Cent. States For. Exp. Stn. FA13:1038.
415. Gant, R.E., and E.E.C. Clebsch.
1975. The allelopathic influences of *Sassafras albidum* in old-field succession in Tennessee. *Ecology* 56(3):604-615. FA37:170.
416. Gardner, F.E.
1929. The relationship between tree age and the rooting of cuttings. *Proc. Am. Soc. Hort. Sci.* 26:101-104.
417. Garin, G.I.
1942. Distribution of roots of certain tree species in two Connecticut soils. *Conn. Agric. Exp. Stn. Bull.* 454.
418. Garrett, H.E.
1975. Root initiation and development in sycamore seedlings and cuttings. *Tree Plant. Notes* 26(3):19-20. FA37:5551.
419. Garrett, H.E.
1977. First-year, root-shoot growth observations of eastern cottonwood seedlings and cuttings. *Tree Plant. Notes* 28(1):27-28.
420. Gary, H.L.
1963. Root distribution of five-stamen tamarisk, seepwillow and arrowweed. *For. Sci.* 9(3):311-314. FA25:1905.
421. Gates, F.C.
1938. Layering in black spruce (*Picea mariana* (Mill.) BSP.). *Am. Midl. Nat.* 19:589-594.
422. Gevorkiantz, S.R., P.O. Rudolf, and P.J. Zehngraff.
1943. A tree classification for aspen, jack pine, and second-growth red pine. *J. For.* 41(4):268-274.
423. Gier, L.J.
1945. Development of adventitious roots inside the trunks of trees. *Trans. Kans. Acad. Sci.* 48:198. BA20:5693.
424. Glifford, G.F.
1966. Aspen root studies on three sites in northern Utah. *Am. Midl. Nat.* 75(1):132-141. BA47:55568.
425. Gifford, G.F.
1967. The influence of growth media, temperatures, and light intensities on aspen root and top growth. *USDA For. Serv. Res. Note* INT-67.
426. Gill, C.J.
1970. The flooding tolerance of woody species—a review. *For. Abstr. Leading Art. Ser. For. Bur., Oxford* 44.
427. Gill, C.J.
1975. The ecological significance of adventitious rooting as a response to flooding in woody species, with special reference to *Alnus glutinosa* (L.) Gaertn. *Flora* 164(1):85-97. FA37:3836.
428. Gillespie, W.H., and R.E. Adams.
1962. An awl nematode, *Dolichodoros silvestris* n. sp., from West Virginia. *Nematologica* 8(2):93-98. FA25:1626.
429. Gillgren, I.
1974. [Root tangling, deformation and strangulation.] *Skogen* 61(1):18-21. [In. Swed.] FA35:5015.
430. Gilmore, A.R.
1957. Physical and chemical characteristics of loblolly pine seedlings associated with drought resistance. 4th South. Conf. For. Tree Improv. Proc., Athens, Ga., [8-9 January 1957], p. 34-39.
431. Gilmore, A.R.
1961. The carbohydrate reserves of loblolly pine (*Pinus taeda* L.) roots in relation to early survival of outplanted seedlings. *Diss. Abstr.* 21(12):3576. BA37:15545.
432. Gilmore, A.R.
1964. Food reserves of transplanted loblolly pine seedlings and root growth. *Tree Plant. Notes* 66, p. 15-16. FA26:2102.
433. Gilmore, A.R.
1965. The apparent source of a root growth stimulus in loblolly pine seedlings. *Ill. Agric. Exp. Stn. For. Note* 112. FA27:161.
434. Gilmore, A.R.
1966. Survival of transplanted yellow-poplar seedlings and root food reserves. *Trans. Ill. State Acad. Sci.* 59(4):405-406. BA48:46144.
435. Ginns, J.H., and W.H. Gillespie.
1962. *Fomes* root rot found in five thinned native white pine stands in West Virginia. *Plant Dis. Rep.* 46(10):734. BA42:15527.
436. Girouard, R.M.
1967. Anatomy of adventitious root formation in stem cuttings. *Proc. Plant Propag. Soc.* 17:289-302. FA30:3892.
437. Glock, W.S.
1955. Tree growth. II. Growth rings and climate. *Bot. Rev.* 21(1/3):73-188.
438. Goff, E.S.
1897. A study of the roots of certain perennial plants. *Wis. Agric. Exp. Stn. Annu. Rep.* 14:286-298.
439. Goff, E.S.
1898. The resumption of root growth in spring. *Wis. Agric. Exp. Stn. Annu. Rep.* 14:220-228.
440. Good, R.E., and N.F. Good.
1975. Growth characteristics of two populations of *Pinus rigida* Mill. from the pine barrens of New Jersey. *Ecology* 56(5):1215-1220.
441. Good, R.E., and N.F. Good.
1976. Growth analysis of pitch pine seedlings under three temperature regimes. *For. Sci.* 22(4):445-448.
442. Gosselin, R.
1941. Notes sur le *Polyporus circinatus* Fr. *Ann. Ass. Canad.-franc. Sci.* 7:57. FA3:339.
443. Goyer, R.A., and D.M. Benjamin.
1972. Influence of soil fertility on infestation of jack pine plantations by the pine root weevil. *For. Sci.* 18(2):139-147. BA55:30630.
444. Graham, B.F., Jr.
1959. Root-grafts in eastern white pine, *Pinus strobus* L.: Their occurrence and ecological implications. *Diss. Abstr.* 20(2):466-467. BA35:5369.
445. Graham, B.F., Jr.
1960. Transfer of dye through natural root grafts of *Pinus strobus* L. *Ecology* 41(1):56-64. BA36:8595.
446. Graham, B.F., Jr., and F.H. Bormann.
1966. Natural root grafts. *Bot. Rev.* 32(3):255-292. BA48:66913.
447. Graham, B.F., Jr., and A.L. Rebeck.
1958. The effect of drainage on the establishment and growth of pond pine (*Pinus serotina*). *Ecology* 39(1):33-36. FA20:1798.
448. Graham, S.A.
1958. Problems caused by insects in Lake States forest plantations. *Proc. 10th Int. Congr. Entomol., [Montreal 1956]*, 4:261-272. FA20:3508.
449. Graham, S.A., R.P. Harrison, Jr., and C.E. Westell, Jr.
1963. *Aspens: Phoenix trees of the Great Lakes Region*. Univ. Mich. Press, Ann Arbor.

450. Grand, L.F., and W.W. Ward.
1969. An antibiotic detected in conifer foliage and its relation to *Cenococcum graniforme* mycorrhizae. *For. Sci.* 15(3):286-288. FA31:2180.
451. Grano, C.X.
1953. Wind-firmness of shortleaf and loblolly pines. *South. Lumberman* 187(2345):116.
452. Graves, A.H.
1915. Root rot of coniferous seedlings. *Phytopathology* 5:213-217.
453. Graves, A.H.
1929. The comparative resistance of root and shoot of the American chestnut to the chestnut bark disease. *Nat. Shade Tree Conf. Proc.* 5:56-57.
454. Green, R.J., Jr., and R.G. Pratt.
1970. Root rot of black walnut seedlings caused by *Phytophthora citricola*. *Plant Dis. Rep.* 54(7):583-585. FA32:2708.
455. Green, W.E.
1947. Effect of water impoundment on tree mortality and growth. *J. For.* 45(2):118-120.
456. Greenidge, K.N.H.
1953. Further studies of birch dieback in Nova Scotia. *Can. J. Bot.* 31(5):548-559.
457. Creig, B.J.W.
1962. *Fomes annosus* (Fr.) Cke. and other root-rotting fungi in conifers on ex-hardwood sites. *Forestry* 35(2):164-182. BA42:19557.
458. Gries, G.A.
1943. Juglone—the active agent in walnut toxicity. *North. Nut. Grow. Assoc. Rep.* 34:52-55. BA19:17443.
459. Griffin, G.D.
1963. Pathological and ecological relationships between *Xiphinema americanum* Cobb and commercial spruce. *Diss. Abstr.* 23(12, part 1):4492-4493. FA25:1040.
460. Griffith, B.G., E.W. Hartwell, and T.E. Shaw.
1930. The evolution of soils as affected by the old field white pine-mixed hardwood succession in central New England. *Harv. For. Bull.* 15.
461. Grisyuk, N.M.
1973. Nektorye osobennosti stroeniya kornevykh sistem derev'ev i kustarnikov semeistva bobovykh. [Some characteristics of the structure of the root system of trees and shrubs of the pea family.] *Byull. Gl. Bot. Sada.* 87:12-20. [In Russ.] BA58:24061.
462. Grossenbacher, J.G.
1915. The periodicity and distribution of radial growth in trees and their relation to the development of 'annual rings'. *Trans. Wis. Acad. Sci., Arts, and Lett.* 18:1-77.
463. Gruschow, G.F.
1959. Observations on root systems of planted loblolly pine (*Pinus taeda*). *J. For.* 57(12):894-896. BA35:19773.
464. Gurskii, A.V.
1928/1929. Kornyevihye sistemykh *Fraxinus excelsior* L., *Fraxinus pennsylvanica* Marsch. i *Acer negundo* L. [The root systems of *F. excelsior*, *F. pennsylvanica* and *A. negundo* on the black soil of Kuban.] *Tr. Prikl. Bot., Ghyenetikye i Syelyeksii* 21(3):145-183. [Engl. summ.] BA5:11696.
465. Gurskii, G.F.
1939. [Root systems of trees in steppe and desert soils.] *Dokl. vsesoyuzn. Akad. s.-kh. Nauk* 1939(5/6):45-49. [In Russ.] FA3:112-113.
466. Guttay, A.J.R.
1976. Impact of deicing salts upon the endomycorrhizae of roadside sugar maples. *J. Soil Sci. Soc. Am.* 40(6):952-954. FA39:146.
467. Gysi, C., C.H. Winget, and B. Bernier.
1975. Interactions of P, Mn, and Cu in nutrient uptake by sugar maple. *Can. J. For. Res.* 5(1):105-108. BA60:11002.
468. Haas, A.R.C., and H.S. Reed.
1926. The absorption of ions by citrus and walnut seedlings. *Hilgardia* 2(4):67-106.
469. Habeck, J.R.
1958. White cedar ecotypes in Wisconsin. *Ecology* 39(3):457-463. FA20:150.
470. HacsKaylo, E.
1951. A study of the roots of *Pinus virginiana* in relation to certain Hymenomycetes suspected of being mycorrhizal. *J. Wash. Acad. Sci.* 41(12):399-400.
471. HacsKaylo, E.
1959. The role of mycorrhizae in the mineral nutrition of trees. *Duke Univ. Sch. For. Bull.* 15, Durham, N.C. p. 111-115.
472. HacsKaylo, E.
1962. Research on mycorrhizae in the United States. 13th Int. Union For. Res. Organ. Congr. Proc., [Vienna 1961], Part 2(1), Section 24-6.
473. HacsKaylo, E.
1965. *Thelephora terrestris* and mycorrhizae of Virginia pine. *For. Sci.* 11(4):401-404. FA27:5553.
474. HacsKaylo, E., and G. Bruchet.
1972. Hebelomas as mycorrhizal fungi. *Bull. Torrey. Bot. Club* 99(1):17-20. FA34:147.
475. HacsKaylo, E., and J.G. Palmer.
1955. Hymenomycetous species forming mycorrhizae with *Pinus virginiana*. *Mycologia* 47(1):145-147.
476. HacsKaylo, E., and A.G. Snow, Jr.
1959. Relation of soil nutrients and light to prevalence of mycorrhizae on pine seedlings. *USDA For. Serv. Stn. Pap.* 125, Northeast. For. Exp. Sta.
477. HacsKaylo, E., J.G. Palmer, and J.A. Vozzo.
1965. Effect of temperature on growth and respiration of ectotrophic mycorrhizal fungi. *Mycologia* 57(5):748-756. FA27:5548.
478. Hadi, S.
1974. Epidemiology and control of *Cylindrocladium* stem canker and root rot of conifers in nurseries. *Diss. Abstr. Int.* 35B(4):1473-1474. FA37:3867.
479. Haines, B., and G.R. Best.
1976. The influence of an endomycorrhizal symbiosis on nitrogen movement through soil columns under regimes of artificial through-fall and artificial acid rain. *In First Int. Symp. on Acid Precipitation and the For. Ecosystem Proc.*, USDA For. Serv. Gen. Tech. Rep. NE-23, p. 951-961.
480. Hall, J.P., P. Singh, and H.O. Schooley.
1971. Survival and growth of some exotic firs in Newfoundland. *For. Chron.* 47(5):279-281.
481. Hall, T.F., W.T. Penfound, and A.D. Hess.
1946. Water level relationships of plants in the Tennessee Valley with particular reference to malaria control. *J. Tenn. Acad. Sci.* 21(1):18-59.
482. Hall, T.F., and G.E. Smith.
1955. Effects of flooding on woody plants, West Sandy Dewatering Project, Kentucky Reservoir. *J. For.* 53(4):281-285.
483. Hallmen, U.
1975. Translocation and complex formation of root-applied 2, 4-D and picloram in susceptible and tolerant species. *Physiol. Plant.* 34(3):266-272. FA38:2301.
484. Hamilton, L.S.
1955. Silvicultural characteristics of American beech. *USDA For. Serv. Northeast. Tech. Comm. on the Util. of Beech, Beech Util. Series* 13.
485. Hanes, R.E., L.W. Zelazny, and R.E. Blaser.
1970. Effects of deicing salts on water quality and biota; literature review and recommended research. *Natl. Coop. Highw. Res. Program Rep.* 91, Highw. Res. Bd., Natl. Res. Council.

486. Hannah, P.R.
1972. Yellow birch root occupancy related to stump and breast height diameters. Vt. Agric. Exp. Stn. Bull. 669. FA34:4461.
487. Hansbrough, T., and J.P. Hollis.
1957. The effect of soil fumigation for the control of parasitic nematodes on the growth and yield of loblolly pine seedlings. Plant Dis. Rep. 41(12):1021-1025. FA19:2929.
488. Hansbrough, T.
1959. The effect of soil fumigation on the growth and yield of loblolly pine seedlings in the nursery. Tree Plant. Notes 37, p. 13-16. FA21:1715.
489. Hansen, T.S., W.H. Kenety, G.H. Wiggin, and E.C. Stakman.
1923. A study of the damping-off disease of coniferous seedlings. Minn. Agric. Exp. Stn. Tech. Bull. 15.
490. Harley, J.L.
1940. A study of the root system of the beech in woodland soils with especial reference to mycorrhizal infection. J. Ecol. 28(1):107-118. BA14:8074.
491. Harley, J.L., and J.K. Brierley.
1954. The uptake of phosphate by excised mycorrhizal roots of the beech. VI. Active transport of phosphorus from the fungal sheath into the host tissue. New Phytol. 53(2):240-252. BA29:17235.
492. Harley, J.L., C.C. McCready, and J.K. Brierley.
1958. The uptake of phosphate by excised mycorrhizal roots of the beech. VIII. Translocation of phosphorus in mycorrhizal roots. New Phytol. 57(3):353-362. BA33:27482.
493. Hart, J.H.
1965. Root rot of oak associated with *Cylindrocarpon radicum*. Phytopathology 55(10):1154-1155. BA47:24316.
494. Hartig, T.
1863. Ueber die Zeit des Zuwachses der Bäume. Bot. Zeit. 21:288-289.
495. Hartmann, F.
1962. Root types as site indicator. Can. Dep. For., Ottawa, Transl. by D.C.F. Fayle from Der Waldboden: Humus-, Boden-, und Wurzeltypen als Standortsanzeiger. Osterreichisches Prod. -Zentrum, Vienna 1951, p. 123-152. FA24:3371.
496. Hatch, A.B.
1936. The role of mycorrhizae in afforestation. J. For. 34(1):22-29.
497. Hatch, A.B.
1937. The physical basis of mycotrophy in *Pinus*. Black Rock For. Bull. 6.
498. Hatch, A.B., and K.D. Doak.
1933. Mycorrhizal and other features of the root systems of *Pinus*. J. Arnold Arbor. 14(1):85-99. BA8:1837.
499. Hatch, A.B., and C.T. Hatch.
1933. Some hymenomycetes forming mycorrhizae with *Pinus strobus* L. J. Arnold Arbor. 14:324-334.
500. Hatchell, G.E.
1970. Soil compaction and loosening treatments affect loblolly pine growth in pots. USDA For. Serv. Res. Pap. SE-72. BA52:77851.
501. Hathaway, R.L., and D. Penny.
1975. Root strength in some *Populus* and *Salix* clones. N.Z. J. Bot. 13(3):333-344. FA37:4989. BA61:36990.
502. Havis, J.R.
1976. Root hardiness of woody ornamentals. Hort. Sci. 11(4):385-386. BA63:8271.
503. Hawboldt, L.S., and A.J. Skolko.
1948. Investigation of yellow birch dieback in Nova Scotia in 1947. J. For. 46(9):659-671.
504. Hay, R.L.
1969. Effects of planting deformation on growth of loblolly pine seedlings: A study of root deformation. Diss. Abstr. Int. 30B(6):2485. FA32:5942.
505. Hay, R.L., and F.W. Woods.
1968. Distribution of available carbohydrates in planted loblolly pine root systems. For. Sci. 14(3):301-303. BA50:4874.
506. Hay, R.L.
1974. Root deformation correlated with sapling size for loblolly pine. J. For. 72(3):143-145. FA35:7553.
507. Hay, R.L.
1974. Shape of root systems influences survival and growth of loblolly seedlings. Tree Plant. Notes 25(3):1-2.
508. Hay, R.L.
1975. Distribution of carbohydrates in deformed seedling root systems. For. Sci. 21(3):263-267. BA61:25435.
509. Hayes, F.A., and J.H. Stoeckeler.
1935. Possibilities of shelterbelt planting in the Plains region. Section 12—Soil and forest relationships of the shelterbelt zone. USDA For. Serv. Spec. Rep. Lake States For. Exp. Stn., p. 111-153.
510. Heinsdorf, D., and D. Schulzke.
1969. [Distribution of fine roots of young Scots pine and red oaks in a humus-poor sandy soil after deep ploughing and mineral fertilization.] Arch. Forstw. 18(7):731-745. [In Ger. with Russ. and Eng. summ.] FA31:2385.
511. Heinicke, A.J.
1932. The effect of submerging the roots of apple trees at different seasons of the year. Proc. Am. Soc. Hort. Sci. 29:205-207. BA8:11811.
512. Henderson, G.S.
1969. The influence of mycorrhizae on nutrient uptake and growth of conifer seedlings. Diss. Abstr. 29B(11):3993.
513. Hendrix, F.F., Jr., and W.A. Campbell.
1968. Pythiaceus fungi isolated from southern forest nursery soils and their pathogenicity to pine seedlings. For. Sci. 14(3):292-297.
514. Hendrix, F.F., Jr., and W.M. Powell.
1968. Nematode and *Pythium* species associated with feeder root necrosis of pecan trees in Georgia. Plant Dis. Rep. 52(4):334-335. BA49:86278.
515. Hendrix, F.F., Jr., E.G. Kuhlman, C.S. Hodges, Jr., and E.W. Ross.
1964. *Fomes annosus*, a serious threat to regeneration of pine. USDA For. Serv. Res. Note SE-24. FA26:827.
516. Heninger, R.L., and D.P. White.
1974. Tree seedling growth at different soil temperatures. For. Sci. 20(4):363-367. BA60:2056. FA36:5489.
517. Henry, B.W.
1953. A root rot of southern pine nursery seedlings and its control by soil fumigation. Phytopathology 43(2):81-88. FA14:3314.
518. Hepting, G.H.
1971. Diseases of forest and shade trees of the United States. USDA Agric. Handb. 386.
519. Hepting, G.H., and A.A. Downs.
1944. Root and butt rot in planted white pine at Biltmore, North Carolina. J. For. 42(2):119-123.
520. Herrera, S.
1968. Pudricion radicular en plantulas de pino insignie (*Pinus radiata* D. Don), pino oregon (*Pseudotsuga menziesii*) y nogal negro (*Juglans nigra*). [Root rot in seedlings of *P. radiata*, *P. menziesii* and *J. nigra*.] Agric. Tec. (Santiago) 28(1):43-45. [Engl. summ.] BA50:50100.
521. Hewitt, E.J.
1966. A physiological approach to the study of forest tree nutrition. In Physiology in forestry. Soc. For. G.B. 6th Discuss. Meet. Rep., [Edinburgh, 7-9 January 1966], p. 49-59.
522. Hicks, R.R., Jr.
1972. The aspen rooting test: A new bioassay. For. Sci. 18(1):21-22.
523. Hicks, R.R., Jr., and W.T. Gladstone.
1971. Some anatomical aspects of rooting quaking aspen. 11th South. Conf. For. Tree Improv. Proc. p. 265-274. FA34:4400.
524. Hilf, H.H.
1927. Wurzelstudien an Waldbäumen. Die Wirzelausbreitung und ihre waldbauliche Bedeutung. [Root systems of forest trees and their silvicultural significance.] M. and H. Schaper, Hanover. BA3:9052.

525. Hilton, R.J., and H. Khatamian.
1973. Diurnal variation in elongation rates of roots of woody plants. *Can. J. Plant Sci.* 53(3):699-700. FA35:3483.
526. Himelick, E.B.
1959. Experimental control studies on the oak wilt disease. Ph.D. thesis, Univ. Ill., Urbana.
527. Himelick, E.B.
1959. Experimental control studies on the oak wilt disease. *Diss. Abstr.* 20(5):1554-1555. FA21:3365.
528. Himelick, E.B., and D. Neely.
1962. Root grafting of city-planted American elms. *Plant Dis. Rep.* 46(2):86-87. BA40:8155.
529. Himelick, E.B., and D. Neely.
1962. Frequency of root grafting between city-planted American elms. *Arborist's News* 27(4):29-31. BA41:20333.
530. Himes, W.E., and J.M. Skelly.
1972. An association of the black turpentine beetle, *Dendroctonus terebrans*, and *Fomes annosus* in loblolly pine. (Abstr.) *Phytopathology* 62(6):670. FA34:1132.
531. Hock, W.K., and W.L. Klarman.
1966. Increased disease resistance of Virginia pine seedlings caused by morphological changes in maturing root tissue. (Abstr.) *Phytopathology* 56(6):584. FA28:779.
532. Hocking, D., and D.L. Mitchell.
1975. The influences of rooting volume-seedling escapement and substratum density on greenhouse growth of lodgepole pine (*Pinus contorta*), white spruce (*Picea glauca*), and Douglas fir (*Pseudotsuga menziesii*) grown in extruded peat cylinders. *Can. J. For. Res.* 5(3):440-451.
533. Hodges, C.S., Jr.
1962. Black root rot of pine seedlings. *Phytopathology* 52(3):210-219. FA23:5401.
534. Hodges, C.S., Jr.
1963. Black root rot of pine. In *Symposium on root diseases of forest trees*, Corvallis, Oregon 1962. *Phytopathology* 53(10):1132-1134. BA45:57445.
535. Hodges, C.S., Jr.
1964. The effect of competition by *Peniophora gigantea* on the growth of *Fomes annosus* in stumps and roots. (Abstr.) *Phytopathology* 54(6):623. FA26:844.
536. Hodges, C.S., Jr.
1969. Relative susceptibility of loblolly, longleaf, and slash pine roots to infection by *Fomes annosus*. (Abstr.) *Phytopathology* 59(8):1031. FA31:2786.
537. Hodges, C.S., and E. Jorgensen.
1967. *Fomes annosus* root rot *Fomes annosus* (Fr.) Cke. In *Important forest insects and diseases of mutual concern to Canada, the United States, and Mexico*. A.G. Davidson and R.M. Prentice, eds., *Can. For. Serv. Publ.* 1180, p. 49-52.
538. Hodges, C.S., and E.G. Kuhlman.
1974. Spread of *Fomes annosus* in roots of redcedar and loblolly pine. *Plant Dis. Rep.* 58(3):282-284. FA35:7001.
539. Hodges, C.S., and L.C. May.
1972. A root disease of pine, araucaria and eucalyptus in Brazil caused by a new species of *Cylindrocladium*. *Phytopathology* 62(8):898-901. FA34:1726.
540. Hoffmann, G.
1964. [The effectiveness and host specificity of the nodule bacteria of *Robinia pseudoacacia*.] *Arch. Forstw.* 13(6):563-576. [In Ger. with Russ. and Engl. summ.] FA26:294.
541. Hoffmann, G.
1966. The influence of soil heating on root growth of black locust (*Robinia pseudoacacia* L.). *Pap. 4th World For. Congr.*, [Madrid].
542. Hoffmann, G.
1968. [The effect of soil heating on the growth of roots and shoots of *Robinia pseudoacacia*.] *Arch. Forstw.* 17(4):431-435. [In Ger. with Russ. and Engl. summ.] FA30:297.
543. Hoffmann, G.
1972. [The growth rhythms of roots and shoot axis in forest trees.] *Flora* 161(3):303-319. [In Ger. with Engl. summ.]
544. Holch, A.E.
1931. Development of roots and shoots of certain deciduous tree seedlings in different forest sites. *Ecology* 12(2):259-298. BA8:16267.
545. Hollett, B.P., and M.T. Jackson.
1976. Quantitative aspects of the association of *Cenococcum graniforme* with *Fagus grandifolia* in Indiana. *For. Sci.* 22(2):127-130. FA38:1208.
546. Holm, T.
1909. *Nyssa sylvatica* Marsh. *Am. Midl. Nat.* 1:128-137.
547. Holm, T.
1921. Morphological study of *Carya alba* and *Juglans nigra*. *Bot. Gaz.* 72:375-388.
548. Holm, T.
1931. The seedling of *Hamamelis virginiana* L. *Rhodora* 33(388):81-92.
549. Hong, S.G.
1975. Test of hypothesis that cytokinin will stimulate potassium ion transport in roots of honeylocust (*Gleditsia triacanthos* L.). *Diss. Abstr. Int.* 35B(7):3536. FA37:3478.
550. Hong, S.G., and S.K. Hyun.
1970. Anatomical investigation on root formation in hypocotyl cuttings of pines. *Res. Rep. Inst. For. Genet. Korea* 8, p. 15-22. FA33:2472.
551. Hook, D.D.
1969. Growth and development of swamp tupelo (*Nyssa sylvatica* var. *biflora* (Walt.) Sarg.) under different root environments. *Diss. Abstr.* 29B(12, part 1):4549. FA31:2139.
552. Hook, D.D.
1974. Root (botany). *McGraw-Hill Yearb. of Sci. and Technol.* McGraw-Hill, New York.
553. Hook, D.D., and C.L. Brown.
1973. Root adaptations and relative flood tolerance of five hardwood species. *For. Sci.* 19(3):225-229. BA57:43014.
554. Hook, D.D., C.L. Brown, and P.P. Kormanik.
1970a. Lenticel and water root development of swamp tupelo under various flooding conditions. *Bot. Gaz.* 131(3):217-224.
555. Hook, D.D., P.P. Kormanik, and C.L. Brown.
1970b. Early development of sweetgum root sprouts in coastal South Carolina. *USDA For. Serv. Res. Pap.* SE-62.
556. Hook, D.D., O.G. Langdon, J. Stubbs, and C.L. Brown.
1970c. Effect of water regimes on the survival, growth, and morphology of tupelo seedlings. *For. Sci.* 16(3):304-311.
557. Hook, D.D., C.L. Brown, and P.P. Kormanik.
1971. Inductive flood tolerance in swamp tupelo (*Nyssa sylvatica* var. *biflora* (Walt.) Sarg.). *J. Exp. Bot.* 22(70):78-89.
558. Hook, D.D., C.L. Brown, and R.H. Wetmore.
1972. Aeration in trees. *Bot. Gaz.* 133(4):443-454.
559. Hopkins, H.T., Jr., and R.L. Donahue.
1939. Forest tree root development as related to soil morphology. *Proc. Soil Sci. Soc. Am.* 4:353. BA15:6161.
560. Hord, H.H.V., and M.J. Hildebrand.
1956. *Armillaria mellea* in relation to regeneration of red pine, white pine, and white spruce. *Bi-mon. Progr. Rep. Div. For. Biol., Dep. Agric. Can.* 12(1):2. FA17:4088.
561. Horsley, S.B.
1971. Root tip injury and development of the paper birch root system. *For. Sci.* 17(3):341-348. BA53:16386.
562. Horsley, S.B., and B.F. Wilson.
1971. Development of the woody portion of the root system of *Betula papyrifera*. *AM. J. Bot.* 58(2):141-147. BA52:51455.
563. Horton, K.W., and E.J. Hopkins.
1965. Influence of fire on aspen suckering. *Can. For. Serv. Publ.* 1095. FA27:330.

564. Horton, K.W., and J.C. Lees.
1961. Black spruce in the foothills of Alberta. Can. For. Res. Branch Tech. Note. 110.
565. Hosner, J.F.
1959. Survival, root and shoot growth of six bottomland tree species following flooding. J. For. 57(12):927-928. BA35:19774.
566. Hosner, J.F., and S.G. Boyce.
1962. Tolerance to water saturated soil of various bottomland hardwoods. For. Sci. 8(2):180-186.
567. Hosner, J.F., and D.L. Graney.
1970. The relative growth of three forest tree species on soils associated with different successional stages in Virginia. Am. Midl. Nat. 84(2):418-427. FA32:3994.
568. Hosner, J.F., and A.L. Leaf.
1962. The effect of soil saturation upon the dry weight, ash content, and nutrient absorption of various bottomland tree seedlings. Proc. Soil Sci. Soc. Am. 26(4):401-404. FA24:1768.
569. Hosner, J.F., A.L. Leaf, R. Dickson, and J.B. Hart, Jr.
1964. Effects of varying soil moisture upon the nutrient uptake of four bottomland tree species. Agron. Abstr. 1964:53.
570. Hough, A.F.
1951. Tree roots. Pa. For. 36(346):22-26.
571. Hough, A.F., and R.D. Forbes.
1943. The ecology and silvics of forests in the high plateaus of Pennsylvania. Ecol. Monogr. 13:299-320.
572. Houston, D.R., and H.G. Eno.
1969. The use of soil fumigants to control spread of *Fomes annosus*. USDA For. Serv. Res. Pap. NE-123.
573. Howe, V.K.
1973. Site changes and root damage. Proc. 49th Int. Shade Tree Conf., p. 25-28.
574. Howell, F.C., and W.J. Stambaugh.
1972. Rates of pathogenic and saprophytic development of *Fomes annosus* in roots of dominant and suppressed eastern redcedar. Plant Dis. Rep. 56(11):987-990. BA55:51255.
575. Hoyle, M.C.
1965. Addition of phosphorus to subsoil promotes root development of yellow birch. USDA For. Serv. Res. Note NE-42. FA28:289.
576. Hoyle, M.C.
1970. Growth and nutrition of yellow birch as affected by the nutrient status of a podzol soil. In Tree growth and forest soils. C.T. Youngberg, and C.B. Davey, eds., 3rd North Am. For. Soils Conf. Proc., N.C. State Univ., Raleigh, [August 1968], Oreg. State Univ. Press, Corvallis. p. 221-233.
577. Hoyle, M.C.
1971. Effects of the chemical environment on yellow birch root development and top growth. Plant and Soil 35(3):623-633. BA54:39320.
578. Huberman, M.A.
1940. Normal growth and development of southern pine seedlings in the nursery. Ecology 21(3):323-334.
579. Hudak, J., and P. Singh.
1970. Incidence of *Armillaria* root rot in balsam fir infested by balsam woolly aphid. Can. Plant Dis. Surv. 50(3):99-101.
580. Hunt, F.M.
1951. Effects of flooded soil in growth of pine seedlings. Plant Physiol. 26(2):363-368.
581. Hunt, T.N., and M.H. Farrier.
1974. Oviposition and feeding preference of pales weevil (Coleoptera: Curculionidae) for five types of loblolly pine bark. Ann. Entomol. Soc. Am. 67(3):407-408. FA36:1025.
582. Huntly, J.H., J.D. Cafley, and E. Jorgensen.
1961. *Armillaria* root rot in Ontario. For. Chron. 37(3):228-232. BA37:24623.
583. Husch, B.
1959. Height growth of white pine in relation to selected environmental factors on four sites in southeastern New Hampshire. N.H. Agric. Exp. Stn. Tech. Bull. 100. FA21:2842.
584. Hutchinson, M.T., and J.P. Reed.
1959. The pine cystoid nematode in New Jersey. Plant Dis. Rep. 43(7):801-802. FA23:956.
585. Hutnik, R.J.
1954. Effect of seedbed condition on paper birch reproduction. J. For. 52(7):493-495.
586. Hutnik, R.J.
1964. Functionality of root grafts between scarlet oak trees. (Abstr.) Bull. Ecol. Soc. Am. 45(4):150-151. FA26:3449.
587. Ibberson, J.E.
1949. A preliminary report on the diseased condition of red pine in southeastern Pennsylvania. Pa. For. and Waters 1(6):124-125, 141. FA11:2268.
588. Ike, A.F., and E.L. Stone.
1956. Soil nitrogen accumulation and availability under black locust stands in New York. Agron. Abstr. 1956:50.
589. Ike, A.F., and E.L. Stone.
1958. Soil nitrogen accumulation under black locust. Proc. Soil Sci. Soc. Am. 22(4):346-349.
590. Illick, J.S., and E.F. Brouse.
1926. The *Ailanthus* tree in Pennsylvania. Pa. Dep. For. and Waters Bull. 38.
591. International Symposium: Ecology and Physiology of Root Growth. 1974. [Potsdam, 1971] Akademie-Verlag, Berlin. FA35:7455.
592. Iverson, T.H., and K. Siegel.
1976. The geotropic curvature in roots of Norway spruce (*Picea abies*) containing anthocyanins. Physiol. Plant. 37(4):283-287. BA63:29165.
593. Iyer, J.G., and S.A. Wilde.
1974. Micronutrients in tree nursery soils: Their behavior, and importance, and an appraisal of their deficiencies. Soil Sci. 118(4):267-269. BA59:14296.
594. Jackson, L.W.R.
1938. *Cylindrocladium* associated with diseases of tree seedlings. Plant Dis. Rep. 22:84-85.
595. Jackson, L.W.R.
1945. Root defects and fungi associated with the little-leaf disease of southern pines. Phytopathology 35(2):91-105.
596. Jackson, L.W.R.
1970. Nematode parasitic on shortleaf pine roots. Plant Dis. Rep. 54(6):465-466. FA32:1204.
597. Jackson, L.W.R., and G.H. Hepting.
1964. Rough bark formation and food reserves in pine roots. For. Sci. 10(2):174-179. BA45:84175.
598. Jagels, R.
1963. Gelatinous fibers in the roots of quaking aspen. For. Sci. 9(4):440-443. BA45:52872.
599. Janouch, K.L.
1927. Effect of spacing and root pruning on the development of transplants. J. For. 25(1):62-67.
600. Jeffrey, W.W.
1959. White spruce rooting modifications on the fluvial deposits of the lower Peace River. For. Chron. 35(4):304-311. FA21:2857.
601. Jensen, C.A.
1907. Some mutual effects of tree-roots and grasses on soils. Science (N.S.) 25:871-874.
602. Johansson, M., and O. Theander.
1974. Changes in sapwood of roots of Norway spruce, attacked by *Fomes annosus*. Part I. Physiol. Plant. 30(3):218-225. BA58:27755.

603. Johnson, A.W., T.J. Ratcliffe, and G.C. Freeman.
1970. Control of *Meloidogyne incognita* on dogwood seedlings by chemical dips. *Plant Dis. Rep.* 54(11):952-955. FA32:6548.
604. Johnson, J.R., and J.R. Havis.
1977. Photoperiod and temperature effects on root cold acclimation. *J. Am. Soc. Hort. Sci.* 102(3):306-308. FA39:169.
605. Johnson, R.L., and R.M. Krinard.
1976. Hardwood regeneration after seed tree cutting. *USDA For. Serv. Res. Pap.* SO-123.
606. Johnston, H.R., and C.B. Eaton.
1939. White grubs in forest nurseries of the Carolinas. *USDA Bur. Entomol. and Plant Quar.* E-486. FA2:41.
607. Johnston, W.F.
1970. Planting black spruce on brushy lowland successful if done in unshaded sphagnum. *Tree Plant. Notes* 21(3):20-22. FA32:733.
608. Jones, E.W.
1968. A note on the dimensions of shoots and roots of planting stock. *Forestry* 41(2):199-206. BA50:66842.
609. Jones, J.R.
1974. Aspen sucker growing from an Engelmann spruce stump. *USDA For. Serv. Res. Note* RM-264. FA36:6145.
610. Jones, K.L.
1967. Observations on root tips and associated microorganisms in soil. *Pap. Mich. Acad. Sci.* 52:43-54. FA30:340.
611. Jones, L.R., and W.J. Morse.
1903. The shrubby cinquefoil as a weed. *Vt. Agric. Exp. Stn. Annu. Rep.* 16:173-190.
612. Jones, T.W.
1961. First report of pine mortality caused by *Fomes annosus* root rot in Ohio. *Plant Dis. Rep.* 45(12):980. BA38:11588.
613. Jones, T.W., and A.D. Partridge.
1961. The importance of root grafts in oak wilt spread in Missouri. *Plant Dis. Rep.* 45(7):506-507. BA37:3626.
614. Jordan, M.J.
1975. Effects of zinc smelter emissions and fire on a chestnut-oak woodland. *Ecology* 56(1):78-91. FA36:7027.
615. Jorgensen, E.
1959. *Fomes annosus* root rot. In *Recent advances in botany*. *Proc. 9th Int. Bot. Congr.* [Montreal 1959] 2:40-41. BA36:82414.
616. Jorgensen, E.
1961. On the spread of *Fomes annosus* (Fr.) Cke. *Can. J. Bot.* 39(6):1437-1445. FA23:3834.
617. Jorgensen, J.R.
1968. Root growth of direct-seeded southern pine seedlings. *USDA For. Serv. Res. Note* SO-79.
618. Kahn, M.S.
1969. Fungal associates of *Juglans nigra* L. *Diss. Abstr.* 29B(12, part 1):4471.
619. Kalela, E.K.
1950. Männiköiden ja kuusiköiden juurisuiteista I. [On the horizontal roots in pine and spruce stand I.] *Acta For. Fenn.* 57(2):1-79. [Engl. summ.] BA26:9774.
620. Kalisz, S.P., and J.H. Brown, Jr.
1976. Starch content of oak roots on campsites. *Sci. Biol. J.* 2(4):160-165. BA63:11170.
621. Katzman, G.B.
1971. White spruce in northern New York root by layering. *Tree Plant. Notes* 22(4):15-16.
622. Katznelson, H., J.W. Rouatt, and E.A. Peterson.
1962. The rhizosphere effect of mycorrhizal and non-mycorrhizal roots of yellow birch seedlings. *Can. J. Bot.* 40(3):377-382. BA39:7722.
623. Kaufman, C.M.
1945. Root growth of jack pine on several sites in the Cloquet Forest, Minnesota. *Ecology* 26(1):10-23. BA19:7950.
624. Kaufmann, M.R.
1968. Water relations of pine seedlings in relation to root and shoot growth. *Plant Physiol.* 43(2):281-288. FA30:305.
625. Kearby, W.H.
1966. The bionomics of the pine root weevil *Hylobius rhizophagus* Millers and the weevil complex associated with plantation deterioration. *Diss. Abstr.* 26(9):4978-4979. FA28:989.
626. Kearby, W.H., and D.M. Benjamin.
1969. Life history and damage of the pine root tip weevil, *Hylobius rhizophagus*, in Wisconsin. *Ann. Entomol. Soc. Am.* 62(4):838-843. BA51:17021.
627. Keller, T.
1967. Beitrag zur Kenntnis der Wurzelatmung von Koniferenjungpflanzen. [Contribution to the knowledge of root respiration of young conifers.] 14th Int. Union For. Res. Organ. Congr. Proc., [Munich 1967], Part IV, Section 23, p. 329-340. [Engl. and Fr. summ.] FA29:1846.
628. Kelley, A.P.
1937. The form and occurrence of mycorrhizae in the genus *Populus*. *Landenberg Rev.* 1937:54-56. FA1:76.
629. Kelley, A.P.
1941. The variations in form of mycorrhizal short roots of *Pinus virginiana* Mill. associated with certain soil series. *Landenberg Lab., Landenberg, Pa.* FA3:20.
630. Kelley, A.P.
1943. Note on the mycorrhizae of *Pinus virginiana* Mill. *Landenberg Lab., Landenberg, Pa.* FA5:11.
631. Kelley, A.P.
1950. Mycotrophy in plants. *Chron. Bot. Co., Waltham, Mass.*
632. Kelley, A.P.
1960. The root endings of beech, maple, and dogwood as found in the eastern U.S.A. *Folia for. polon. (Lesn.)* 4, p. 45-88. FA23:237.
633. Kelman, A., and G.V. Gooding, Jr.
1965. A root and stem rot of yellow-poplar caused by *Cylindrocladium scoparium*. *Plant Dis. Rep.* 49(9):797-801. BA47:24326.
634. Kelman, A., G.V. Gooding, Jr., and G.K. Slocum.
1959. *Cylindrocladium* root rot of yellow-poplar (*Liriodendron tulipifera* L.). *J. Elisha Mitchell Sci. Soc.* 75(2):66-67. BA36:66068.
635. Kennedy, G.E.
1937. Root growth on white oak acorns. *USDA For. Serv. R-9 Bull.* 10(3):7.
636. Keresztesi, B.
1955. Néhány adat az akác gyökérrendszeréről. [Some data on the root system of *Robinia pseudoacacia*.] *Erdő* 4(3):113-121. FA17:2558.
637. Kessler, K.J.
1966. Growth and development of mycorrhizae of sugar maple (*Acer saccharum* Marsh.). *Can. J. Bot.* 44(10):1413-1425.
638. Khashes, Ts. M.
1975. Determining the viability of root systems of seedlings. *Inst. Pap. Chem., Appleton, Wis.* [Engl. transl.] FA37:3740.
639. Khatamian, H.
1971. Seasonal and diurnal root growth patterns of certain woody plants. M.S. thesis, Univ. Guelph, Ontario, Canada.
640. Khatamian, H., and R.J. Hilton.
1971. Development of ectomycorrhiza on red pine roots. *Can. J. For. Res.* 1(4):269-272. BA53:68898.
641. Kienholz, R.
1934. Leader, needle, cambial, and root growth of certain conifers and their inter-relations. *Bot. Gaz.* 96(1):73-92. BA9:10142.
642. Kinden, D.A.
1975. An ultrastructural study of vesicular-arbuscular mycorrhizae on yellow-poplar. *Diss. Abstr. Int.* 35B(9):4310. FA36:7534.

643. Kirby, C.S., and H.G. McPhee.
1963. Some field observations on the cicada, *Okanagana rimosa* (Say). Bi-mon Progr. Rep., For. Entomol. Pathol. Branch, Dep. For. Can. 19(5):1. FA25:2431.
644. Kirby, H.W., and L.F. Grand.
1975. Susceptibility of *Pinus strobus* and *Lupinus* spp. to *Phytophthora cinnamomi*. Phytopathology 65(6):693–695. FA37:1698.
645. Kitteredge, J., and S.R. Gevorkiantz.
1929. Forest possibilities of aspen lands in the Lake States. Minn. Agric. Exp. Stn. Tech. Bull. 60.
646. Kochenderfer, J.N.
1973. Root distribution under some forest types native to West Virginia. Ecology 54(2):445–448. BA56:48300.
647. Koenigs, J.W.
1960. *Fomes annosus*: A bibliography with subject index. USDA For. Serv. Occ. Pap. 181. South. For. Exp. Stn. FA23:761.
648. Koenigs, J.W.
1971. Borax: Its toxicity to *Fomes annosus* in wood and its diffusion, persistence, and concentration in treated stumps of southern pines. Phytopathology 61(3):269–274. FA32:6269.
649. Kolesnikov, V.A.
1930. The root system of fruit tree seedlings. J. Pomol. and Hort. Sci. 8(3):197–203. BA6:25384.
650. Korać, M.
1970. Competition and root systems coalescence in nest seeding of some forest tree species with a special account of beech treatment. Silvae Genet. 19(2/3):99–101. FA32:345.
651. Kormanik, P.P., and C.L. Brown.
1967. Root buds and the development of root suckers in sweetgum. For. Sci. 13(4):338–345. BA49:27685.
652. Korstian, C.F.
1927. Factors controlling germination and early survival in oaks. Yale Univ. Sch. For. Bull. 19, p. 7–115. BA2:18493.
653. Korstian, C.F., and T.S. Coile.
1938. Plant competition in forest stands. Duke Univ. Sch. For. Bull. 3, Durham, N.C.
654. Köstler, J.N.
1962. Untersuchungen zur Wurzelbildung. [Investigations on root formation.] Allg. Forst Z. 28:413–417.
655. Kovaleva, A.N.
1972. Kornevaya sistema drevesnykh i kustarnikovykh rastenii. Ukazatel' otechestvennoi i inostrannoi literatury. Chast' I 1900–1965. [The root system of trees and shrubs. A bibliography of Russian and foreign literature. Part I 1900–1965.] Moscow, USSR, MGU. FA34:5644.
656. Kozłowski, T.T.
1949. Light and water in relation to growth and competition of Piedmont forest tree species. Ecol. Monogr. 19(3):207–231.
657. Kozłowski, T.T.
1968. Growth and development of *Pinus resinosa* seedlings under controlled temperatures. Adv. Front. Plant Sci. 19:17–27. FA30:5345.
658. Kozłowski, T.T., and J.H. Cooley.
1960. Natural root grafting in forest trees. Univ. Wis. For. Res. Notes 56. FA22:254.
659. Kozłowski, T.T., and J.H. Cooley.
1961. Natural root grafting in northern Wisconsin. J. For. 59(2):105–107. BA36:38773.
660. Kozłowski, T.T., and W.L. Scholtes.
1948. Growth of roots and root hairs of pine and hardwood seedlings in the Piedmont. J. For. 46(10):750–754. BA23:19598.
661. Kozłowski, T.T., and C.H. Winget.
1961. Patterns of water uptake in forest trees. Univ. Wis. For. Res. Notes 72.
662. Kozłowski, T.T., and C.H. Winget.
1964a. Contributions of various plant parts to growth of pine shoots. Univ. Wis. For. Res. Notes 113.
663. Kozłowski, T.T., and C.H. Winget.
1964b. The role of reserves in leaves, branches, stems, and roots on shoot growth of red pine. Am. J. Bot. 51(5):522–529. BA45:88632.
664. Kramer, P.J.
1933. The intake of water through dead root systems and its relation to the problem of absorption by transpiring plants. Am. J. Bot. 20:481–492.
665. Kramer, P.J.
1942. Species differences with respect to water absorption at low soil temperatures. Am. J. Bot. 29:828–832. FA5:90.
666. Kramer, P.J.
1946. Absorption of water through suberized roots of trees. Plant Physiol. 21(1):37–41. FA8:896.
667. Kramer, P.J.
1951a. Causes of injury to plants resulting from flooding of the soil. Plant Physiol. 26(4):722–736.
668. Kramer, P.J.
1951b. Effects of respiration inhibitors on accumulation of radioactive phosphorus by roots of loblolly pine. Plant Physiol. 26(1):30–36. FA13:1853.
669. Kramer, P.J., and H.C. Bullock.
1966. Seasonal variations in the proportions of suberized and unsuberized roots of trees in relation to the absorption of water. Am. J. Bot. 53(2):200–204. FA28:316.
670. Kramer, P.J., and R.H. Hodgson.
1954. Differences between mycorrhizal and non-mycorrhizal roots of loblolly pine. Proc. 8th Int. Bot. Congr., [Paris 1954], Part 5, Section 13, p. 133–134. FA16:222.
671. Kramer, P.J., and H.H. Wiebe.
1952. Longitudinal gradients of P^{32} absorption in roots. Plant Physiol. 27(4):661–674. BA27:7686.
672. Kramer, P.J., and K.M. Wilbur.
1949. Absorption of radioactive phosphorus by mycorrhizal roots of pine. Science 110(2844):8–9.
673. Kramer, P.J., W.S. Riley, and T.T. Bannister.
1952. Gas exchange of cypress knees. Ecology 33(1):117–121.
674. Krebill, R.G.
1962. Etiology of a jack and red pine plantation decline characterized by root weevil injury and fungal deterioration. Diss. Abstr. 23(6):1861. FA24:4010.
675. Krebill, R.G., and R.F. Patton.
1962. Wounds in jack pine (*P. banksiana*) roots as entry points for a succession of fungi. (Abstr.) Phytopathology 52(8):739. BA41:24683.
676. Krebill, R.G., K.R. Barker, and R.F. Patton.
1967. Plant-parasitic nematodes of jack and red pine stands in Wisconsin. Nematologica 13(1):33–42. FA28:6070.
677. Kriebel, H.B.
1963. Selection for drought resistance in sugar maple. World Consult. on For. Genet. and Tree Improv., Section 3, FAO, Stockholm, Sweden.
678. Krupa, S., and J.E. Nylund.
1972. Studies on ectomycorrhizae of pine. III. Growth inhibition of two root pathogenic fungi by volatile organic constituents of ectomycorrhizal root systems of *Pinus sylvestris* L. Eur. J. For. Pathol. 2(2):88–94. BA54:68650.
679. Krupa, S., J. Andersson, and D.H. Marx.
1973. Studies on ectomycorrhizae of pine. IV. Volatile organic compounds in mycorrhizal and nonmycorrhizal root systems of *Pinus echinata* Mill. Eur. J. For. Pathol. 3(4):194–200. FA36:694.
680. Krywolap, G.N., L.F. Grand, and L.E. Casida, Jr.
1964. The natural occurrence of an antibiotic in the mycorrhizal fungus *Cenococcum graniforme*. Can. J. Microbiol. 10(3):323–328. FA26:299.

681. Kuhlman, E.G.
1969a. Variation in susceptibility of some forest tree seedlings to infection by *Fomes annosus*. (Abstr.) *Phytopathology* 59(8):1036. FA31:2785.
682. Kuhlman, E.G.
1969b. Inoculation of loblolly pine seedlings with *Fomes annosus* in the greenhouse. *Can. J. Bot.* 47(12):2079–2082. FA31:6653.
683. Kuhlman, E.G.
1969c. Number of conidia necessary for stump root infection by *Fomes annosus*. *Phytopathology* 59(8):1168–1169. FA31:2783.
684. Kuhlman, E.G.
1970a. Decomposition of loblolly pine bark and soil- and root-inhabiting fungi. *Can. J. Bot.* 48(10):1787–1793. BA52:16343.
685. Kuhlman, E.G.
1970b. Seedling inoculations with *Fomes annosus* show variation in virulence and in host susceptibility. *Phytopathology* 60(12):1743–1746. FA32:6249.
686. Kuhlman, E.G.
1972. Susceptibility of loblolly and slash pine progeny to *Fomes annosus*. USDA For. Serv. Res. Note SE-176. FA34:5240.
687. Kuhlman, E.G.
1973. Rate of infection of loblolly pine roots on high- and low-hazard sites by *Fomes annosus*. (Abstr.) *Phytopathology* 63(4):444. FA35:223.
688. Kuhlman, E.G., C.S. Hodges, Jr., and R.C. Froelich.
1976. Minimizing losses to *Fomes annosus* in the southern United States. USDA For. Serv. Res. Pap. SE-151.
689. Kuntz, J.E.
1961. Oak wilt: Its development, spread, and control. *In* Recent advances in botany, 9th Int. Bot. Congr. [Montreal 1959] 2:1544–1548.
690. Kuntz, J.E., and A.J. Riker.
1950a. Oak wilt in Wisconsin. *Wis. Conserv. Bull.* 15(6): 20–23. FA12:3389.
691. Kuntz, J.E., and A.J. Riker.
1950b. Root grafts as a possible means for local transmission of oak wilt. (Abstr.) *Phytopathology* 40(1):16–17. FA11:3293.
692. Kuntz, J.E., and A.J. Riker.
1950c. The translocation of poisons between oak trees through natural root grafts. 7th Annu. North Cent. Weed Control Conf. Res. Rep., Milwaukee, Wis., p. 242. FA13:1208.
693. Kuntz, J.E., and A.J. Riker.
1956. The use of radioactive isotopes to ascertain the role of root grafting in the translocation of water, nutrients, and disease-inducing organisms among forest trees. *Int. Conf. Peaceful Uses Atomic Energy Proc.* [Geneva 1955] 12:144–148. FA18:1283.
694. Kurz, H., and K. Wagner.
1952. The role of adventitious roots in survival of cypress. (Abstr.) *J. Tenn. Acad. Sci.* 27(3):201. FA14:3168.
695. Lachance, D.
1974. Développement de *Odontia bicolor* chez le sapin baumier infecté artificiellement. [Development of *O. bicolor* in artificially infected balsam fir.] *Can. J. For. Res.* 4(3):327–334. [Engl. summ.]
696. Lachance, D.
1975. Inoculations of balsam fir with *Odontia bicolor*: Early establishment and associated microorganisms. *Can. J. For. Res.* 5(1):130–138. FA36:6381.
697. Lachance, D.
1976. Étude de carie dans une plantation d'épinettes blanches fertilisées. [Study of decay in a fertilized white spruce plantation.] *Rapp. d'Inf. Cent. Rech. For. des Laurentides.* LAU-X-18.
698. Ladefoged, K.
1948. Analysis of the root sap of the birch. *Plant and Soil* 1(2):127–134. BA23:19647.
699. LaFond, A.
1950. The rate of respiration of jack pine root tips as influenced by extracts from different types of humus. *Proc. Soil Sci. Soc. Am.* 15:357–359. BA26:2105.
700. (Laing, E.V.)
1932. Studies on tree roots. (G. B.) *For. Comm. Bull.* 13. BA8:19453.
701. Lampky, J.R., and J.E. Peterson.
1963. *Pisolithus tinctorius* associated with pines in Missouri. *Mycologia* 55(5):675–678. FA25:4572.
702. Lane, C.L., and A.T. Shearin.
1972. Aldrin affects nematodes and mycorrhizal growth on loblolly pine seedlings. *For. Sci.* 18(4):319–320. FA34:5305.
703. Lane, R.D., and A.L. McComb.
1953. Effects of grass competition upon the establishment of hardwood plantations in Iowa. *Ia. Agric. Exp. Stn. Res. Bull.* 399, p. 433–459. FA15:1175.
704. Larsen, J.A.
1935. Natural spreading of planted black locust in southeastern Ohio. *J. For.* 33(4):616–619.
705. Larson, M.M.
1970. Root regeneration and early growth of red oak seedlings: Influence of soil temperature. *For. Sci.* 16(4): 442–446. BA52:36841.
706. Larson, M.M.
1974. Effects of temperature on early growth of oak seedlings. *In* Forestry research review—1974. *Agric. Res. and Dev. Cent., Wooster, Ohio.* p. 6–9. FA36:3212.
707. Larson, M.M.
1974. Effects of soil moisture on early growth of oak seedlings. *In* Forestry research review—1974. *Agric. Res. and Dev. Cent., Wooster, Ohio,* p. 10–13. FA36:4524.
708. Larson, M.M., and I. Palashev.
1973. Effects of osmotic water stress and gibberellic acid on initial growth of oak seedlings. *Can. J. For. Res.* 3(1):75–82. BA56:48890.
709. Larson, M.M., and F.W. Whitmore.
1970. Moisture stress affects root regeneration and early growth of red oak seedlings. *For. Sci.* 16(4):495–498. BA52:36845.
710. La Rue, C.D.
1934. Root grafting in trees. *Am. J. Bot.* 21(3):121–126. BA8:20838.
711. Laycock, W.A.
1967. Distribution of roots and rhizomes in different soil types in the pine barrens of New Jersey. *U.S. Geol. Surv. Prof. Pap.* 563–C. FA29:2099.
712. Leaf, A.L.
1957. Diagnosis of deficiencies of available potassium calcium, and magnesium in forested soils. *Diss. Abstr.* 17(9):1859. FA19:1472.
713. Leaf, A.L., and D.H. Bickelhaupt.
1975. Possible mutual prediction between black cherry and sugar maple foliar analysis data. *Proc. Soil Sci. Soc. Am.* 39(5):983–985. BA61:31319.
714. Leaf, A.L., and S.A. Wilde.
1957. Decomposition products of sloughed root tissues promote release of available nutrients. *Univ. Wis. For. Res. Note* 40. FA19:2634. (see next entry)
715. Leaf, A.L., and S.A. Wilde.
1959. Decomposition products of sloughed root tissues promote release of available nutrients. *Univ. Wis. For. Res. Note* 49. FA21:1330.
716. Leaf, A.L., R.E. Leonard, and J.V. Berglund.
1971. Root distribution of a plantation-grown red pine in an outwash soil. *Ecology* 52(1):153–158. BA52:77849.

717. Leaphart, C.D.
1960. A root stain disease of eastern white pine. *Plant Dis. Rep.* 44(9):704–706. BA36:42591.
718. Leaphart, C.D.
1963. *Armillaria* root rot. USDA For. Serv. For. Pest Leaflet. 78.
719. LeBarron, R.K.
1944. Influence of controllable environmental conditions on regeneration of jack pine and black spruce. *J. Agric. Res.* 68(3):97–119.
720. LeBarron, R.K.
1945. Adjustment of black spruce root systems to increasing depth of peat. *Ecology* 26(3):309–311. BA19:18067.
721. Leclercq, W.L.
1960. Dennenmoorder en *Prunus serotina*. [*Fomes annosus* and *P. serotina*.] *Ned. Bosb. Tijdschr.* 32(2):74–75.
722. Ledig, F.T., and T.O. Perry.
1966. Physiological genetics of the shoot-root ratio. *Proc. Soc. Am. For.* 1965, p. 39–43. FA28:342.
723. Ledig, F.T., F.H. Bormann, and K.F. Wenger.
1970. The distribution of dry matter growth between shoot and roots in loblolly pine. *Bot. Gaz.* 131(4):349–359. BA52:89184.
724. Ledig, F.T., A.P. Drew, and J.G. Clark.
1976. Maintenance and constructive respiration, photosynthesis, and net assimilation rate in seedlings of pitch pine (*Pinus rigida* Mill.). *Ann. Bot.* 40(166):289–300. BA62:63012.
725. Lee, C.I., B.C. Moser, and C.E. Hess.
1974. Root regeneration of transplanted pin and scarlet oak. *New Horiz. Hort. Res. Inst., Washington, D.C.*, p. 10–13.
726. Leiser, A.T.
1968. A mucilaginous root sheath in Ericaceae. *Am. J. Bot.* 55(3):391–398.
727. Lemon, P.C.
1945. Wood as a substratum for perennial plants in the Southeast. *Am. Midl. Nat.* 34(3):744–749. BA20:19423.
728. Levisohn, I.
1952. Forking in pine roots. *Nature* 169(4304):715. FA13:3681.
729. Levisohn, I.
1954. Aberrant root infections of pine and spruce seedlings. *New Phytol.* 53:284–290.
730. Lewis, F.J., E.S. Dowding, and E.H. Moss.
1928. The vegetation of Alberta. II. The swamp, moor, and bog forest vegetation of central Alberta. *J. Ecol.* 16(1):19–70.
731. Leyton, L., and L.Z. Rousseau.
1958. Root growth of tree seedlings in relation to aeration. *In* The physiology of forest trees. A symposium. K.V. Thimann, ed. Maria Moors Cabot Found. for Bot. Res. Int. Symp. For. Tree Physiol., Harvard Univ. Cambridge, Mass. Ronald Press Co., New York. p. 467–475. BA33:19470.
732. Lightle, P.C.
1960. *Fomes annosus* root rot of loblolly pine. *Plant Dis. Rep.* 44(6):423. BA36:8859.
733. Liming, F.G., and J.P. Johnston.
1944. Reproduction in oak-hickory forest stands of the Missouri Ozarks. *J. For.* 42(3):175–180.
734. Limstrom, G.A., R.F. Finn, and G.H. Deitschman.
1955. Planting stock grades for yellow poplar. *J. For.* 53(1):28–32. BA30:11328.
735. Ling-lee, M., G.A. Chilvers, and A.E. Ashford.
1975. Polyphosphate granules in three different kinds of tree mycorrhiza. *New Phytol.* 75(3):551–554. FA37:3603.
736. Lister, G.R.
1968. Observations on the growth and physiology of *Pinus strobus* L. seedlings grown under various conditions of soil moisture and nitrogen and phosphorus nutrition. (Parts I and II). *Diss. Abstr.* 29B(4):1277. FA30:3677.
737. Lister, G.R., V. Slankis, G. Krotkov, and C.D. Nelson.
1968. The growth and physiology of *Pinus strobus* L. seedlings as affected by various nutritional levels of nitrogen and phosphorus. *Ann. Bot. (N.S.)* 32(125):33–43. BA49:112933.
738. Little, S.
1973. Survival, growth of loblolly, pitch, shortleaf pines established by different methods in New Jersey. *Tree Plant. Notes* 24(4):1–5. FA35:6848.
739. Little, S., and H.A. Somes.
1964. Root systems of direct-seeded and variously planted loblolly, shortleaf, and pitch pines. *USDA For. Serv. Res. Pap. NE-26.* BA46:63682.
740. Loach, K., and C.H.A. Little.
1973. Production, storage and use of photosynthate during shoot elongation in balsam fir (*Abies balsamea*). *Can. J. Bot.* 51(6):1161–1168. FA35:2165.
741. Lodewich, J.E.
1928. Seasonal activity of the cambium in some northeastern trees. *Bull. N.Y. State Coll. For., Tech. Publ.* 23.
742. Loftus, N.S.
1971. Yellow-poplar root development on Hartsells subsoils. *USDA For. Serv. Res. Note SO-131.* FA33:4038.
743. Logan, K.T.
1965. Growth of tree seedlings as affected by light intensity. I. White birch, yellow birch, sugar maple and silver maple. *Can. Dep. For. Publ.* 1121.
744. Logan, K.T.
1966. Growth of tree seedlings as affected by light intensity. II. Red pine, white pine, jack pine and eastern larch. *Can. Dep. For. Publ.* 1160.
745. Logan, K.T.
1966. Growth of tree seedlings as affected by light intensity. III. Basswood and white elm. *Can. Dep. For. Publ.* 1176.
746. Logan, K.T.
1969. Growth of tree seedlings as affected by light intensity. IV. Black spruce, white spruce, balsam fir, and eastern white cedar. *Can. Dep. Environ. For. Serv. Publ.* 1256.
747. Logan, K.T.
1973. Growth of tree seedlings as affected by light intensity. V. White ash, beech, eastern hemlock, and general conclusions. *Can. Dep. Environ. For. Serv. Publ.* 1323.
748. Lohman, M.L.
1926. Occurrence of mycorrhiza in Iowa forest plants. *Ia. Univ. Stud. in Nat. Hist.* 11(10):33–58.
749. Lorio, P.L., Jr., and J.D. Hodges.
1968. Microsite effects on oleoresin exudation pressure of large loblolly pines. *Ecology* 49(6):1207–1210. FA30:5201.
750. Lorio, P.L., Jr., and J.D. Hodges.
1971. Microrelief, soil water regime, and loblolly pine growth on a wet, mounded site. *Proc. Soil Sci. Soc. Am.* 35(5):795–800. BA53:31362.
751. Lorio, P.L., Jr., V.K. Howe, and C.N. Martin.
1972. Loblolly pine rooting varies with microrelief on wet sites. *Ecology* 53(6):1134–1140. BA55:59708.
752. Lortie, M.
1966. Observations sur l'enracinement du bouleau à papier à la suite d'études sur le dépérissement. [Observations on the rooting habit of white birch following studies on its decline.] *Nat. Can.* 93(3):199–206. [Engl. summ.] BA48:9655.
753. Love, H.S., Jr.
1972. The detection and nature of functional underground connections between members of certain woody species of the Oklahoma Cross Timbers. *Diss. Abstr. Int.* 33B(2):600. FA35:6728.

754. Luckoff, H.A.
1955. Two hitherto unrecorded fungal diseases attacking pines and eucalyptus in South Africa. *J. S. Afr. For. Assoc.* 26, p. 47-61. FA18:578.
755. Luncz, G.
1931. Recent research work on the root systems of forest trees. *Int. Rev. Agric.* 22:239T-243T.
756. Lunt, H.A.
1934. Distribution of soil moisture under isolated forest trees. *J. Agric. Res.* 49(8):695-703. BA10:1645.
757. Lutz, H.J.
1930. Effect of cattle grazing on vegetation of a virgin forest in northwestern Pennsylvania. *J. Agric. Res.* 41(7):561-570.
758. Lutz, H.J.
1939. Layering in eastern white pine. *Bot. Gaz.* 101:505-507. FA2:32.
759. Lutz, H.J.
1956. Ecological effects of forest fires in the interior of Alaska. *USDA Tech. Bull.* 1133.
760. Lutz, H.J., J.B. Ely, Jr., and S. Little, Jr.
1937. The influence of soil profile horizons on root distribution of white pine (*Pinus strobus* L.). *Yale Univ. Sch. For. Bull.* 44.
761. Lyarskaya, R.P.
1959. Nekotorye osobennosti estestvennogo vegetativnogo razmnozheniya uksusnogo dereva (*Rhus typhina* L.) kornevymi otrpryskami. [Certain specific features of the natural vegetative reproduction of *R. typhina* by means of root suckers.] *Nauch Dok. Vyssh. Shk. Biol. Nauk.* 1:117-123. BA40:16411.
762. Lyford, W.H., and B.F. Wilson.
1964. Development of the root system of *Acer rubrum* L. *Harvard For. Pap.* 10. BA47:9504.
763. Lyford, W.H., and B.F. Wilson.
1966. Controlled growth of forest tree roots: Technique and application. *Harvard For. Pap.* 16. BA48:71969.
764. Lyle, E.S., Jr., and F. Adams.
1971. Effect of available soil calcium on taproot elongation of loblolly pine (*Pinus taeda* L.) seedlings. *Proc. Soil Sci. Soc. Am.* 35(5):800-805. BA53:31363.
765. Lyon, C.J.
1949. Secondary growth of white pine in bog and upland. *Ecology* 30(4):549-552. BA24:3286.
766. Lyr, H., and G. Hoffmann.
1967. Growth rates and growth periodicity of tree roots. *Int. Rev. For. Res.* 2:181-236. FA29:3567.
767. MacAloney, H.J.
1944. Relation of root condition, weather, and insects to the management of jack pine. *J. For.* 42(2):124-129.
768. McAlpine, R.G.
1959. Flooding kills yellow-poplar. *For. Farmer* 19(3):9, 13-14.
769. McAlpine, R.G.
1961. Yellow-poplar seedlings intolerant to flooding. *J. For.* 59(8):566-568.
770. McAlpine, R.G., and L.W.R. Jackson.
1959. Effect of age on rooting of loblolly pine air-layers. *J. For.* 57(8):565-566. BA34:14315.
771. McArdle, R.E.
1932. The relation of mycorrhizae to conifer seedlings. *J. Agric. Res.* 44(4):287-316.
772. McClurkin, I.T., and D.C. McClurkin.
1967. Cytochemical demonstration of a sodium-activated and a potassium-activated adenosine triphosphatase in loblolly pine seedling root tips. *Plant Physiol.* 42(8):1103-1110. FA29:1986.
773. McColl, J.G.
1973. Soil moisture influence on growth, transpiration, and nutrient uptake of pine seedlings. *For. Sci.* 19(4):281-288. FA35:5813.
774. McComb, A.L.
1938. The relation between mycorrhizae and the development and nutrient absorption of pine seedlings in a prairie nursery. *J. For.* 36(11):1148-1153. FA1:16.
775. McComb, A.L.
1943. Mycorrhizae and phosphorus nutrition of pine seedlings in a prairie soil nursery. *la. Agric. Exp. Stn. Res. Bull.* 314, p. 582-612. BA17:19568.
776. McComb, A.L., and J.E. Griffith.
1946. Growth stimulation and phosphorus absorption of mycorrhizal and nonmycorrhizal northern white pine and Douglas fir seedlings in relation to fertilizer treatment. *Plant Physiol.* 21:11-17.
777. MacConnell, J.T.
1959. The oxygen factor in the development and function of the root nodules of alder. *Ann. Bot. (N.S.)* 23(90):261-268. BA35:11174.
778. McDermott, R.E.
1954. Effects of saturated soil on seedling growth of some bottom-land hardwood species. *Ecology* 35(1):36-41.
779. McDougall, W.B.
1914. On the mycorrhizas of forest trees. *Am. J. Bot.* 1(2):51-74.
780. McDougall, W.B.
1916. The growth of forest tree roots. *Am. J. Bot.* 3(7):384-392.
781. McDougall, W.B.
1921a. A preliminary key to some forest tree roots. *Trans. Ill. Acad. Sci.* 14:87-91.
782. McDougall, W.B.
1921b. Thick-walled root hairs of *Gleditsia* and related genera. *Am. J. Bot.* 8(3):171-175.
783. McDougall, W.B.
1922. Mycorrhizas of coniferous trees. *J. For.* 20(3):255-260.
784. McEwen, J.K.
1966. An effect of sphagnum on the growth of black spruce. *For. Chron.* 42(2):175-183. FA28:275.
785. McGauley, B., and M. Hubbes.
1976. Relative susceptibility of selected pure and hybrid pines to *Fomes annosus* (Fr.) Cke. *Eur. J. For. Pathol.* 6(3):167-176. FA38:1437.
786. McKenzie, J.S., C.J. Weiser, and P.H. Li.
1974. Changes in water relations of *Cornus stolonifera* during cold acclimation. *J. Am. Soc. Hort. Sci.* 99(3):223-228. FA36:3214.
787. McLaughlin, S.B., N.T. Edwards, and J.J. Beauchamp.
1977. Spatial and temporal patterns in transport and respiratory allocation of [¹⁴C] sucrose by white oak (*Quercus alba*) roots. *Can. J. Bot.* 55(23):2971-2980.
788. McLintock, T.F.
1954. Factors affecting wind damage in selectively cut stands of spruce-fir in Maine and northern New Hampshire. *USDA For. Serv. Stn. Pap.* 70. Northeast. For. Exp. Stn.
789. McQuilkin, W.E.
1935. Root development of pitch pine, with some comparative observations on shortleaf pine. *J. Agric. Res.* 51(11):983-1016. BA10:6818.
790. McVean, D.N.
1956. Ecology of *Alnus glutinosa* (L.) Gaertn. III. Seedling establishment. *J. Ecol.* 44(1):195-218. FA17:3703.
791. McVean, D.N.
1956. Ecology of *Alnus glutinosa* (L.) Gaertn. IV. Root system. *J. Ecol.* 44(1):219-225. FA17:3704.
792. Mai, W.F., H.W. Crittenden, and W.R. Jenkins.
1960. Distribution of stylet-bearing nematodes in the northeastern United States. *N.J. Agric. Exp. Stn. Bull.* 795.
793. Maini, J.S.
1968. Silvics and ecology of *Populus* in Canada. *In* Growth and utilization of poplars in Canada. J.S. Maini and J.H. Cayford, eds., *Can. Dep. For. Publ.* 1205, p. 20-69.

794. Maini, J.S., and K.W. Horton.
1966. Vegetative propagation of *Populus* spp. I. Influence of temperature on formation and initial growth of aspen suckers. *Can. J. Bot.* 44(9):1183–1189. BA48:4151.
795. Maisenhelder, L.C.
1957. Propagation of some Delta hardwoods by rooting. 4th South. Cong. For. Tree Improv. Proc., Athens, Ga., [8–9 January 1957], p. 55–58.
796. Maki, T.E., and H. Marshall.
1945. Effects of soaking with indolebutyric acid on root development and survival of tree seedlings. *Bot. Gaz.* 107(2):268–276. BA20:9036.
797. Malek, R.B., and J.D. Smolik.
1975. Effect of *Xiphinema americanum* on growth of shelterbelt trees. *Plant Dis. Rep.* 59(2):144–148. FA36:5808.
798. Mann, W.F., Jr.
1950. Competition for light, water, and nutrients. USDA For. Serv. South. For. Notes 69. South. For. Exp. Stn., p. 3.
799. Manolova, Y., and I. Palashev.
1974. [The water-retaining capacity of the roots of several forest tree species.] *Gorskostop. Nauka* 11(2): 14–19. [In Bulg. with Russ. and Engl. summ.] FA36:129.
800. Marshall, R.P.
1948. A white root rot which merits study as possible cause of white pine blight. *Scientific Tree Topics* 1(9): 66–68. Bartlett Tree Res. Lab., Stamford, Conn. FA10:2242.
801. Martin, J.L.
1965. Living stumps aid insect control. *Can. For. Ind.* 85(7):40–43.
802. Marx, D.H.
1966. The role of ectotrophic mycorrhizal fungi in the resistance of pine roots to infection by *Phytophthora cinnamomi* Rands. *Diss. Abstr.* 27B(6):1692. FA28:5873.
803. Marx, D.H.
1969a. The influence of ectotrophic mycorrhizal fungi in the resistance of pine roots to pathogenic infections. I. Antagonism of mycorrhizal fungi to root pathogenic fungi and soil bacteria. *Phytopathology* 59(2):153–163. FA30:5389.
804. Marx, D.H.
1969b. The influence of ectotrophic mycorrhizal fungi on the resistance of pine roots to pathogenic infections. II. Production, identification, and biological activity of antibiotics produced by *Leucopaxillus cerealis* var. *piceina*. *Phytopathology* 59(4):411–417.
805. Marx, D.H.
1970. The influence of ectotrophic mycorrhizal fungi on the resistance of pine roots to pathogenic infections. V. Resistance of mycorrhizae to infection by vegetative mycelium of *Phytophthora cinnamomi*. *Phytopathology* 60(10):1472–1473.
806. Marx, D.H.
1973. Growth of ectomycorrhizal and nonmycorrhizal shortleaf pine seedlings in soil with *Phytophthora cinnamomi*. *Phytopathology* 63(1):18–23.
807. Marx, D.H.
1975. Mycorrhizae and establishment of trees on strip-mined land. *Ohio J. Sci.* 75(6):288–297. FA37:5550.
808. Marx, D.H.
1976. Synthesis of ectomycorrhizae on loblolly pine seedlings with basidiospores of *Pisolithus tinctorius*. *For. Sci.* 22(1):13–20.
809. Marx, D.H.
1977a. Manipulation of selected mycorrhizal fungi to increase forest biomass. TAPPI, For. Biol./Wood Chem. Conf., Madison, Wis.
810. Marx, D.H.
1977b. Tree host range and world distribution of the ectomycorrhizal fungus *Pisolithus tinctorius*. *Can. J. Microbiol.* 23(3):217–223.
811. Marx, D.H., and W.C. Bryan.
1969. Effect of soil bacteria on the mode of infection of pine roots by *Phytophthora cinnamomi*. *Phytopathology* 59(5):614–619. FA31:895.
812. Marx, D.H., and W.C. Bryan.
1970. Pure culture synthesis of ectomycorrhizae by *Thelephora terrestris* and *Pisolithus tinctorius* on different conifer hosts. *Can. J. Bot.* 48:639–643. FA32:332.
813. Marx, D.H., and W.C. Bryan.
1971. Influence of ectomycorrhizae on survival and growth of aseptic seedlings of loblolly pine at high temperature. *For. Sci.* 17(1):37–41. BA52:83967.
814. Marx, D.H., and W.C. Bryan.
1975a. Growth and ectomycorrhizal development of loblolly pine seedlings in fumigated soil infested with the fungal symbiont *Pisolithus tinctorius*. *For. Sci.* 21(3):245–254. BA61:25436.
815. Marx, D.H., and W.C. Bryan.
1975b. The significance of mycorrhizae to forest trees. In *Forest soils and forest land management*. B. Bernier and C.H. Winget, eds., p. 107–117. 4th North Am. For. Soils Conf. Proc., Laval Univ., 1973. Press l'Univ. Laval, Québec. FA37:2174.
816. Marx, D.H., and C.B. Davey.
1967. Ectotrophic mycorrhizae as deterrents to pathogenic root infections. *Nature* 213(5081):1139. BA49:31620.
817. Marx, D.H., and C.B. Davey.
1969a. The influence of ectotrophic mycorrhizal fungi on the resistance of pine roots to pathogenic infection. III. Resistance of aseptically formed mycorrhizae to infection by *Phytophthora cinnamomi*. *Phytopathology* 59(5):549–558. BA51:98534.
818. Marx, D.H., and C.B. Davey.
1969b. The influence of ectotrophic mycorrhizal fungi on the resistance of pine roots to pathogenic infections. IV. Resistance of naturally occurring mycorrhizae to infections by *Phytophthora cinnamomi*. *Phytopathology* 59(5):559–565. BA51:98533.
819. Marx, D.H., W.C. Bryan, and C.B. Davey.
1970a. Influence of temperature on aseptic synthesis of ectomycorrhizae by *Thelephora terrestris* and *Pisolithus tinctorius* on loblolly pine. *For. Sci.* 16(4):424–431.
820. Marx, D.H., W.C. Bryan, and L.F. Grand.
1970b. Colonization, isolation, and cultural descriptions of *Thelephora terrestris* and other ectomycorrhizal fungi of shortleaf pine seedlings grown in fumigated soil. *Can. J. Bot.* 48(2):207–211.
821. Marx, D.H., W.C. Bryan, and C.E. Cordell.
1976. Growth and ectomycorrhizal development of pine seedlings in nursery soils infested with the fungal symbiont *Pisolithus tinctorius*. *For. Sci.* 22(1):91–100.
822. Marx, D.H., W.C. Bryan, and C.E. Cordell.
1977. Survival and growth of pine seedlings with *Pisolithus* ectomycorrhizae after two years on reforestation sites in North Carolina and Florida. *For. Sci.* 23(3):363–373.
823. Marx, D.H., A.B. Hatch, and J.F. Mendicino.
1977. High soil fertility decreases sucrose content and susceptibility of loblolly pine roots to ectomycorrhizal infection by *Pisolithus tinctorius*. *Can. J. Bot.* 55(12):1569–1574. BA64:50025.
824. Massey, A.B.
1925. Antagonism of the walnuts (*Juglans nigra* L. and *J. cinerea* L.) in certain plant associations. *Phytopathology* 15:773–784.
825. Mattoon, W.R.
1915. The southern cypress. *USDA Bull.* 272.
826. Medve, R.J.
1969. Development and morphology of the beaded rootlets, mycorrhizae, and associated root fan structures of red maple (*Acer rubrum* L.). *Diss. Abstr. Int.* 30B(1):82–83. FA32:2208.
827. Medve, R.J.
1970. Beaded rootlets and associated root fan structures of *Acer rubrum* L. *Pa. Acad. Sci.* 44:122–126.
328. Medve, R.J.
1970. Influence of genotype and soil on root fan structures of *Acer rubrum*. *Can. J. Bot.* 48(1):147–152. BA51:63045.

829. Medve, R.J.
1970. The relationship of beaded rootlets and mycorrhizae of red maple (*Acer rubrum* L.). *Am. Midl. Nat.* 83(2):631-634. FA32:2207.
830. Medve, R.J.
1971. Beaded rootlets in *Acer*. *Pa. Acad. Sci.* 45:98-100.
831. Medve, R.J., F.M. Hoffman, and T.W. Gaither.
1977. The effects of mycorrhizal-forming amendments on the revegetation of bituminous stripmine spoils. *Bull. Torrey Bot. Club* 104(3):218-225.
832. Melin, E., H. Nilsson, and E. Hacskeylo.
1958. Translocation of cations to seedlings of *Pinus virginiana* through mycorrhizal mycelium. *Bot. Gaz.* 119 (4):243-246.
833. Menge, J.A., L.F. Grand, and L.W. Haines.
1977. The effect of fertilization on growth and mycorrhizae numbers in 11-year-old loblolly pine plantations. *For. Sci.* 23(1):37-44.
834. Mergen, F.
1954. Mechanical aspects of wind-breakage and windfirmness. *J. For.* 52(2):119-125.
835. Mergen, F., and J. Worrall.
1965. Effect of environment and seed source on mineral content of jack pine seedlings. *For. Sci.* 11(4):393-400. FA27:5391.
836. Merrit, C.
1959. Studies on the root growth of red pine (*Pinus resinosa* Ait.). Ph.D. thesis, Univ. Mich., Ann Arbor.
837. Merrit, C.
1968. Effect of environment and heredity on the root-growth pattern of red pine. *Ecology* 49(1):34-40. BA49:86074.
838. Merz, R.W., and S.G. Boyce.
1956. Age of oak 'seedlings'. *J. For.* 54(11):774-775. BA31:25786.
839. Meserve, A.W.
1937. Effect of changing grades around trees and suggested treatment. *Natl. Shade Tree Conf. Proc.* 13:36-51.
840. Meyer-Brenken.
1954. Wurzelbildung der roteiche. [Root development of *Quercus borealis*.] *Forest-u. Holzw.* 9(22):464-465. FA17:1339.
841. Migunova, E.S.
1976. [Root systems of woody species on saline soils in the southern Ukrainian SSR.] *Lesovedenie* 6:27-36. [In Russ. with Russ. and Engl. summ.] BA64:13694.
842. Mikola, P.
1952. Effect of forest humus on parasitic fungi causing damping-off disease of coniferous seedlings. *Phytopathology* 42(4):202-203. FA13:3785.
843. Mikola, P.
1953. An experiment on the invasion of mycorrhizal fungi into prairie soil. *Karstenia* 2, p. 33-34. FA17:227.
844. Miller, A.E., and M. Reines.
1974. Survival and water relations in loblolly pine seedlings after root immersion in alginate solution. *For. Sci.* 20(2):192-194. FA36:2034.
845. Miller, L., and F.W. Woods.
1965. Root-grafting in loblolly pine. *Bot. Gaz.* 126(4): 252-255. BA47:54141.
846. Miller, O.K.
1959. Red pine mortality from root rot (*Fomes annosus* (Fries) Cooke). *Fox For. Note 75*, Caroline A. Fox Res. and Demonstration For., N.H. FA21:3356.
847. Miller, T.
1964. Host factors influencing infection and growth of *Fomes annosus* in roots of *Pinus taeda*. (Abstr.) *Phytopathology* 54(8):901. BA46:45190.
848. Miller, T., and A. Kelman.
1966. Growth of *Fomes annosus* in roots of suppressed and dominant loblolly pines. *For. Sci.* 12(2):225-233. BA47:109517.
849. Mirov, N.T.
1967. The genus *Pinus*. Univ. Calif. Press, Berkeley.
850. Mitchell, H.L.
1934. Pot culture tests of forest soil fertility, with observations on the effect of varied solar radiation and nutrient supply on the growth and nitrogen content of Scots and white pine seedlings. *Black Rock For. Bull.* 5. BA9:16639.
851. Mitchell, H.L.
1939. The growth and nutrition of white pine (*Pinus strobus* L.) seedlings in cultures with varying nitrogen, phosphorus, potassium, and calcium, with observations on the relation of seed weight to seedling yield. *Black Rock For. Bull.* 9.
852. Mitchell, H.L., and R.F. Finn.
1937. The relative feeding power of oaks and maples for soil phosphorus. *Black Rock For. Pap.* 1(2):5-9.
853. Mitchell, H.L., and R.O. Rosendahl.
1939. The relationships between cumulative solar radiation and the dry weight increase of nursery-grown white pine and red pine seedlings. *Black Rock For. Pap.* 1(13):88-93. FA1:75.
854. Mogensen, H.L.
1967. A contribution to the developmental anatomy of the root of *Quercus* L. Ia. *State J. Sci.* 41(4):413-423. BA48:87618.
855. Monk, C.D.
1966. Root-shoot dry weights in loblolly pine. *Bot. Gaz.* 127(4):246-248. BA48:56539.
856. Monk, C.D.
1967. The root-shoot weight relationship of four widely separated seedling populations of red maple. *Bull. Torrey Bot. Club* 94(3):197-199. BA48:109879.
857. Monk, R., and H.B. Peterson.
1962. Tolerance of some trees and shrubs to saline conditions. *Proc. Am. Soc. Hort. Sci.* 81:556-561.
858. Moore, A.W.
1964. Note on non-leguminous nitrogen-fixing plants in Alberta. *Can. J. Bot.* 42(7):952-955. FA26:1892.
859. Moore, B.
1922a. Humus and root systems in certain northeastern forests in relation to reproduction and competition. *J. For.* 20(3):233-254.
860. Moore, B.
1922b. Influence of certain soil factors on the growth of tree seedlings and wheat. *Ecology* 3(1):65-83.
861. Moreland, D.E.
1950. A study of the translocation of radioactive phosphorus in loblolly pine (*Pinus taeda* L.). *J. Elisha Mitchell Sci. Soc.* 66(2):175-181. FA13:938.
862. Moriando, F.
1959. Un singolare attaccodi *Armillaria* sp. su *Robinia pseudoacacia* L. [A peculiar attack by *A. mellea* on *R. pseudoacacia*.] *Ital. For. Mont.* 14(5):207-209. [Fr. summ.] FA21:1990.
863. Morris, R.C., T.H. Filer, J.D. Solomon, F.I. McCracken, N.A. Overgaard, and M.J. Weiss.
1975. Insects and diseases of cottonwood. *USDA For. Serv. Gen. Tech. Rep.*, SO-8. FA37:6241.
864. Morrison, I.K.
1970. The absorption of nutrients by roots of coniferous seedlings in relation to root characteristics and soil conditions. *Diss. Abstr. Int.* 31B(2):460. FA33:330.
865. Morrison, I.K.
1974. Dry-matter and element content of roots of several natural stands of *Pinus banksiana* Lamb. in northern Ontario. *Can. J. For. Res.* 4(1):61-64. BA58:13804.
866. Morrison, R.H., and D.W. French.
1969. Taxonomy of *Cylindrocladium floridanum* and *C. scoparium*. *Mycologia* 61(5):957-966.
867. Morrow, R.R.
1950. Periodicity and growth of sugar maple surface layer roots. *J. For.* 48(12):875-881. BA25:29061.

868. Mosher, D.G., and L.F. Wilson.
1977. Scotch pine deterioration in Michigan caused by pine root weevil complex. *Great Lakes Entomol.* 10(4):169-172. BA65:32913.
869. Moss, E.H.
1938. Longevity of seed and establishment of seedlings in species of *Populus*. *Bot. Gaz.* 99(3):529-542.
870. Motto, C.K.
1964. Cation exchange capacities of tree roots in relation to their mineral compositions. M.S. thesis, Univ. Ill., Urbana.
871. Moxley, L., and H. Davidson.
1973. Salt tolerance of various woody and herbaceous plants. *Mich. State Univ. Hort. Rep.* 23.
872. Mueller, O.P., and M.G. Cline.
1959. Effects of mechanical soil barriers and soil wetness on rooting of trees and soil-mixing by blow-down in central New York. *Soil Sci.* 88(2):107-111. BA34:11332.
873. Mueller-Dombois, D.
1964. Effect of depth to water table on height growth of tree seedlings in a greenhouse. *For. Sci.* 10(3):306-316. FA26:1873.
874. Mullin, R.E.
1963. Growth of white spruce in the nursery. *For. Sci.* 9(1):68-72. FA24:4881.
875. Mullin, R.E.
1966. Root pruning of nursery stock. *For. Chron.* 42(3):256-264. BA48:15147.
876. Mullin, R.E.
1967. Root exposure of white spruce nursery stock. *For. Chron.* 43(2):155-160. BA48:113886.
877. Mullin, R.E.
1978. Root exposure, root dipping and extended spring planting of white pine seedlings. *For. Chron.* 54(2):84-87.
878. Musselman, R.C., D.T. Lester, and M.S. Adams.
1975. Localized ecotypes of *Thuja occidentalis* L. in Wisconsin. *Ecology* 56(3):647-655. BA60:42576.
879. Myren, D.T., and R.F. Patton.
1971. Establishment and spread of *Polyporus tomentosus* in pine and spruce plantations in Wisconsin. *Can. J. Bot.* 49(6):1033-1040. FA33:945.
880. Myren, D.T., H.L. Gross, and E.B. Dorworth.
1975. *Cylindrocladium floridanum* in an Ontario forest nursery. *Bi-mon. Res. Notes* 31(5):34. FA37:4585.
881. Nair, V.M.G., and J.E. Kuntz.
1963. *Ceratocystis fagacearum* in roots of infected bur oaks and the recurrence and spread of oak wilt. (Abstr.) *Phytopathology* 53(8):884. BA45:44124.
882. Neary, D., M. Day, and G. Schneider.
1972. Density-growth relationships in a nine-year-old red pine plantation. *Mich. Acad.* 5(2):219-232. BA56:14103.
883. Neely, D., and E.B. Himelick.
1963. Root graft transmission of Dutch elm disease in municipalities. *Plant Dis. Rep.* 47(2):83-85. BA45:79790.
884. Nelson, T.C.
1951. A reproduction study of northern white-cedar. *Mich. Dep. Conserv., Game Div.*
885. Nemeth, J.C.
1973. Dry matter production in young loblolly (*Pinus taeda* L.) and slash pine (*Pinus elliotii* Engelm.) plantations. *Ecol. Monogr.* 43(1):21-41. FA34:6852.
886. Nesbitt, W.A.
1942. Aerial roots from old tree wound. *Plant Physiol.* 17(4):689-690. BA17:12276.
887. Nicholas, A.K., and R.J. Hutnik.
1971. Ectomycorrhizal establishment and seedling response on variously treated deep-mine coal refuse. *Pa. State Univ., Coll. Earth and Mineral Sci. Spec. Res. Rep.* SR-89. FA36:2691.
888. Norton, J.A., J.P. Walter, Jr., and J.B. Storey.
1970. The effect of herbicides on lateral roots and nut quality of pecans. *Weed Sci.* 18(4):520-522. BA51:133010.
889. Nova Scotia Department of Lands and Forests.
1946. Root washings of yellow birch. *Rep. Dep. Lands and For.* 1945, p. 45-47, 52. FA8:1459.
890. O'Leary, J.W.
1964. Exudation from root systems of woody plants. *Diss. Abstr.* 25(5):2727. BA46:63389.
891. O'Leary, J.W.
1965. Root-pressure exudation in woody plants. *Bot. Gaz.* 126(2):108-115. FA27:1708.
892. O'Leary, J.W., and P.J. Kramer.
1964. Root pressure in conifers. *Science* 145(3629):284-285. BA46:12782.
893. O'Neil, W.J.
1928. More about living stumps. *J. For.* 26(2):244-245. BA3:9085.
894. Oosting, H.J., and P.J. Kramer.
1946. Water and light in relation to pine reproduction. *Ecology* 27(1):47-53.
895. Opalicki, K.
1969. [Occurrence of root nematodes in forest nurseries.] *Sumar. List* 93(3/4):126-130. [In Serb. with Engl. summ.] FA31:4974.
896. Orlič, S., M. Harapin, M. Halambek, and B. Mayer.
1973. Sušeje američkog borovca (*Pinus strobus* L.) u kulturama. [Die-back of eastern white pine (*P. strobus* L.) in plantations.] *Sumar. List* 97(9/10):375-385. [Engl. summ.] FA35:5400.
897. Ortmann, C.
1961. Vorläufige Untersuchungsergebnisse zur Frage der Selektionstypen für die Frühdiagnose von *Salix alba*-Populationen. [Preliminary investigations on the question of the type selection for the early diagnoses of *S. alba* populations.] *Silvae Genet.* 10(2):43-48. [Engl. summ.] FA23:133.
898. Oskamp, J.
1932. The rooting habit of deciduous fruits on different soils. *Proc. Am. Soc. Hort. Sci.* 29:213-219. BA9:5636.
899. Otrosina, W.J., and D.H. Marx.
1975. Populations of *Phytophthora cinnamomi* and *Pythium* spp. under shortleaf and loblolly pines in littleleaf disease sites. *Phytopathology* 65(11):1224-1229. FA37:3398.
900. Ouellette, G.B., and G. Bard.
1961. Notes on the occurrence of *Armillaria* root rot. *Bi-mon. Progr. Rep., For. Entomol. Pathol. Branch, Dep. For. Can.* 17(6):1-2.
901. Ouellette, G.B., G. Bard, and R. Cauchon.
1971. Self-strangulation of roots: Points of entry of root-rot fungi in the Grand'Mère white spruce plantations. *Phytoprotection* 52(3):119-124.
902. Ovington, J.D.
1957. Dry-matter production by *Pinus silvestris* L. *Ann. Bot. (N.S.)* 21:287.
903. Page, F.S.
1927. Living stumps. *J. For.* 25(6):687-690. BA3:2766.
904. Paine, L.A.
1956. Développement des racines de l'épinette blanche en sol sablonneux. [Development of the roots of white spruce in sandy soil.] (Abstr.) *Ann. ACFAS (Assoc. Con. Fr. Av. Sci.)* 22:54. FA19:2813.
905. Park, J.Y.
1970. A change in color of aging mycorrhizal roots of *Tilia americana* formed by *Cenococcum graniforme*. *Can. J. Bot.* 48(7):1339-1341. BA52:1933.
906. Parker, J.
1950. The effects of flooding on the transpiration and survival of some southeastern forest tree species. *Plant Physiol.* 25(3):453-460.

907. Parker, J.
1959. Seasonal variations in sugars of conifers with some observations on cold resistance. *For. Sci.* 5(1):56-63. BA33:35079.
908. Parker, J.
1968. Drought resistance of roots of white ash, sugar maple, and red oak. USDA For. Serv. Res. Pap. NE-95.
909. Parker, J.
1970. Effects of defoliation and drought on root food reserves in sugar maple seedlings. USDA For. Serv. Res. Pap. NE-169.
910. Parker, J.
1974. Effects of defoliation, girdling, and severing of sugar maple trees on root starch and sugar levels. USDA For. Serv. Res. Pap. NE-306.
911. Parker, J.
1975. The nature of starch storage fiber cells in *Acer saccharum*. *Adv. Front. of Plant Sci.* 30:137-150. FA37:74.
912. Parker, J., and D.R. Houston.
1971. Effects of repeated defoliation on root and root collar extractives of sugar maple trees. *For. Sci.* 17(1):91-95. BA52:83977.
913. Parker, J., and R.L. Patton.
1975. Effects of drought and defoliation on some metabolites in roots of black oak seedlings. *Can. J. For. Res.* 5(3):457-463. BA61:16540.
914. Patton, R.F., and R.V. Bravo.
1967. *Armillaria* root rot: *Armillaria mellea* (Vahl. ex Fr.) Kummer. In *Important forest insects and diseases of mutual concern to Canada, the United States, and Mexico*. A. G. Davidson, and R.M. Prentice, eds. Can. For. Serv. Publ. 1180, p. 37-38.
915. Patton, R.F., and R.G. Krebill.
1960. Deterioration of immature jack and red pine plantations in Wisconsin. *Univ. Wis. For. Res. Notes* 64. FA22:3425.
916. Patton, R.F., and R.G. Krebill.
1960. Deterioration of immature jack and red pine plantations in Wisconsin. (Abstr.) *Phytopathology* 50(9):642-643. FA22:2175.
917. Patton, R.F., and D.T. Myren.
1970. Root rot induced by *Polyporus tomentosus* in pine and spruce plantations in Wisconsin. In *Root diseases and soil-borne pathogens*. T.A. Toussoun, R.V. Bega, and P.E. Nelson, eds. Univ. Calif. Press, Berkeley, p. 167-170.
918. Patton, R.F., and A.J. Riker.
1954. Top growth and root development of rooted white pine cuttings. *J. For.* 52(9):675-677.
919. Patton, R.F., and A.J. Riker.
1958. Rooting cuttings of white pine. *For. Sci.* 4(2):116-127.
920. Patton, R.F., and A.J. Riker.
1959. Artificial inoculations of pine and spruce trees with *Armillaria mellea*. *Phytopathology* 49(9):615-622. FA21:1989.
921. Pawsey, R.G., and M.A. Rahman.
1976. Chemical control of infection by honey fungus, *Armillaria mellea*: A review. *J. Aboric.* 2(9):161-169.
922. Pearsall, W.H.
1943. The mycorrhizal relations of *Pinus*. *J. Ecol.* 31(1):41-44. BA17:23140.
923. Pellett, N.E.
(n. d. Circa 1975) Salt tolerance of trees and shrubs. *Univ. Vt. Ext. Serv. Brieflet* 1212.
924. Perevertailo, B.I.
1971. Root system of *Juglans nigra* in young plantations. [Kornevaya sistema orekha chernogo v molodykh kul'turakh]. *Transl., Can. Dep. Sec. State Transl. Bur., Foreign Lang. Div. from Lesn. Zh.* 12(2):151-154 (1969). (Transl. *Environ. Can. No. OOENV-10*). FA31:4113.
925. Perry, G.S.
1932. Some tree antagonisms. *Proc. Pa. Acad. Sci.* 6:136-141.
926. Perry, T.O.
1971. Winter-season photosynthesis and respiration by twigs and seedlings of deciduous and evergreen trees. *For. Sci.* 17(1):41-43. FA33:122.
927. Peterson, E.B.
1965. Inhibition of black spruce primary roots by a water-soluble substance in *Kalmia angustifolia*. *For. Sci.* 11(4):473-479. FA27:5571.
928. Peterson, L.O.T., and H.A. Worden.
1968. Root borers in poplar cuttings beds. *Summ. Rep. Tree Nursery Sask.* 1967, p. 7-9. FA29:5949.
929. Pharis, R.P., R.L. Barnes, and A.W. Naylor.
1964. Effects of nitrogen level, calcium level and nitrogen source upon the growth and composition of *Pinus taeda* L. *Physiol. Plant.* 17(3):560-572. FA26:4868.
930. Pillai, A.
1964. Root apical organization in gymnosperms—some conifers. *Bull. Torrey Bot. Club* 91(1):1-13. BA45:56822.
931. Pizelle, G.
1975. [Seasonal variations in the nitrogenase activity of root nodules in *Alnus glutinosa*, *A. incana*, and *A. cordata*.] *C. R. Hebd. des Séances de l'Acad. Sci., France*, D 281(23):1829-1832. [In Fr. with Engl. summ.] FA37:6016.
932. Platt, W.D., E.B. Cowling, and C.S. Hodges, Jr.
1964. Resistance of coniferous root wood and stem wood to decay by *Fomes annosus*. (Abstr.) *Phytopathology* 55(2):130-131. BA46:72910.
933. Platt, W.D.
1965. Comparative resistance of coniferous root wood and stem wood to decay by isolates of *Fomes annosus*. *Phytopathology* 55(12):1347-1353. BA47:49395.
934. Plice, M.J., and G.W. Hedden.
1931. Selective girdling of hardwoods to release young growth of conifers. *J. For.* 29(1):32-40.
935. Plowman, A.B.
1915. Is the box-elder a maple? A study of the comparative anatomy of *Negundo*. *Bot. Gaz.* 60:169-172.
936. Pomerleau, R., and M. Lortie.
1956. Relation entre le dépérissement du bouleau blanc et l'état des racines. [Relation between the dieback of white birch and the condition of the roots.] (Abstr.) *Ann. ACFAS (Assoc. Con. Fr. Av. Sci.)* 22:55. FA19:3257.
937. Pomerleau, R., and M. Lortie.
1962. Relationships of dieback to the rooting depth of white birch (*Betula papyrifera*). *For. Sci.* 8(3):219-224. BA41:16423.
938. Pomeroy, K.B.
1949. The germination and initial establishment of loblolly pine under various surface soil conditions. *J. For.* 47(7):541-543.
939. Potzger, J.E.
1937. Vegetative reproduction in conifers. *Am. Midl. Nat.* 18:1001-1004.
940. Powers, H.R., Jr., and C.S. Hodges, Jr.
1970. *Annosus* root rot in eastern pines. *USDA For. Serv. For. Pest Leaflet* 76.
941. Prasad, R.
1975. Protection of elm trees against the Dutch elm disease (*Ceratocystis ulmi* Buism/Moreau) in the urban environments: Some factors affecting uptake and translocation of the systemic fungicide, Benomyl, by roots. *Inf. Ref. CC-X Chem. Control Res. Inst.* 133.
942. Prasad, R., and R.P. Moody.
1974. A preliminary study on the chemical control of maple roots (*Acer saccharinum* L.) with herbicides. *Chem. Control Res. Inst., Can. Rep. CC-X-77*. FA36:6989.
943. Pritchett, W.L.
1972. The effect of nitrogen and phosphorus fertilizers on the growth and composition of loblolly and slash pine seedlings in pots. *Proc. Soil and Crop Sci. Soc. Fla.* 32:161-165. FA36:3944.

944. Pronos, J., and R.F. Patton.
1977. *Armillaria* root rot of red pine planted on oak sites in Wisconsin. Plant Dis. Rep. 61(11):955-958.
945. Pudova, R.A.
1974. [Effect of seed pre-treatment with trace elements on the growth of the root system in *Fraxinus pennsylvanica*.] Byull. Gl. Bot. Sada 92, p. 74-79. [In Russ.] FA36:2006.
946. Pulling, H.E.
1918. Root habit and plant distribution in the far north. Plant World 21:223-233.
947. Raabe, R.D.
1962. Host list of the root rot fungus, *Armillaria mellea*. Hilgardia 33(2):25-88. FA24:5165.
948. Raju, M.V.S., R.T. Coupland, and T.A. Steeves.
1966. On the occurrence of root buds on perennial plants in Saskatchewan. Can. J. Bot. 44(1):33-37. FA27:5572.
949. Ralston, C.W.
1973. Annual primary productivity in a loblolly pine plantation. In Biomass studies. H.E. Young, ed. Int. Union For. Res. Organ. Congr. Univ. Maine Press, Orono. p. 105-117.
950. Ralston, C.W., R.C. Chapman, and R.S. Kinerson, Jr.
1972. Biomass distribution in a loblolly pine plantation. US-IBP East. Deciduous For. Biome Memo. Rep. 72-79.
951. Rangnekar, P.V., and D.F. Forward.
1972. Foliar nutrition and growth in red pine: Distribution of photo-assimilated carbon in seedlings during bud expansion. Can. J. Bot. 50(10):2053-2061. FA34:3233.
952. Rathbun-Gravatt, A.
1931. Germination loss of coniferous seeds due to parasites. J. Agric. Res. 42(2):71-92.
953. Redmond, D.R.
1954. Increased soil temperatures cause rootlet mortality in yellow birch. Bi-mon. Progr. Rep. Div. For. Biol., Dep. Agric. Can. 10(3):1. FA16:740.
954. Redmond, D.R.
1954. Variations in development of yellow birch roots in two soil types. For. Chron. 30(4):401-406. BA29:26970.
955. Redmond, D.R.
1955. Soil temperatures and yellow birch decline. Bi-mon. Progr. Rep. Div. For. Biol, Dep. Agric. Can. 11(5):1. FA17:1825.
956. Redmond, D.R.
1955. Studies in forest pathology. XV. Rootlets, mycorrhiza, and soil temperatures in relation to birch dieback. Can. J. Bot. 33(6):595-627.
957. Redmond, D.R.
1957. Observations on rootlet development in yellow birch. For. Chron. 33(3):208-212. BA32:13776.
958. Redmond, D.R.
1957. The future of birch from the viewpoint of diseases and insects. For. Chron. 33(1):25-30.
959. Redmond, D.R.
1959. Mortality of rootlets in balsam fir defoliated by the spruce budworm. For. Sci. 5(1):64-69. BA33:35286.
960. Reed, J.F.
1939. Root and shoot growth of shortleaf and loblolly pines in relation to certain environmental conditions. Duke Univ. Sch. For. Bull. 4, Durham N.C. BA14:14321.
961. Regehr, D.L., F.A. Bazzaz, and W.R. Boggess.
1975. Photosynthesis, transpiration and leaf conductance of *Populus deltoides* in relation to flooding and drought. Photosynthetica 9(1):52-61.
962. Reid, C.P.P.
1968. Nutrient transfer by mycorrhizae. Diss. Abstr. 29B(2):429. FA30:3695.
963. Reid, C.P.P., and W. Hurtt.
1970. Root exudation of herbicides by woody plants: Allelopathic implications. Nature 225(5229):291. FA31:4710.
964. Reid, C.P.P., and F.W. Woods.
1967. Atmospheric transfer of carbon-14. A problem in fungus translocation studies. Science 157(3789):712-713.
965. Reid, C.P.P., and F.W. Woods.
1969. Translocation of C¹⁴-labeled compounds in mycorrhizae and its implications in interplant nutrient cycling. Ecology 50(2):179-187.
966. Reineke, L.H.
1942. Effect of pregermination and radicle damage on first-year development of red oak. J. For. 40(4):346-347. FA4-102.
967. Reineke, L.H.
1942. Effect of stocking and seed on nursery development of eastern white pine seedlings. J. For. 40(7):577-578. FA4:166.
968. Reines, M., and J.H. Bamping.
1960. Seasonal rooting responses of slash and loblolly pine cuttings. J. For. 58(8):646-647. BA35:64633.
969. Rexrode, C.O., and R.E. Frame.
1977. Root graft incidence at oak wilt sites in West Virginia. Plant Dis. Rep. 61(11):970-971.
970. Richard, C., and J.A. Fortin.
1970a. [The rootlets of *Picea mariana*: Symbiosis and pathology.] (Abstr.) Ann. ACFAS (Assoc. Can. Fr. Av. Sci.) 37(suppl.):9. [In Fr.] FA37:3607.
971. Richard, C., and J.A. Fortin.
1970b. Les mycorrhizes de *Picea mariana* (Mill.) BSP: Aspects morphologiques, anatomiques et systématiques. Nat. Can. 97:163-173. [Engl. summ.]
972. Richard, C., and J.A. Fortin.
1974. Distribution géographique, écologie, physiologie, pathogéné-cité et sporulation du *Mycelium radialis atrovirens*. [Geographical distribution, ecology, physiology, pathogenicity and sporulation of *M. radialis atrovirens*.] Phytoprotection 55(2):67-88. [Engl. summ.] FA36:4856.
973. Richard, C., and J.A. Fortin.
1975. Rôle protecteur du *Suillus granulatus* contre le *Mycelium radialis atrovirens* sur des semis de *Pinus resinosa*. [The protective role of *S. granulatus* against *M. radialis atrovirens* on seedlings of *P. resinosa*.] Can. J. For. Res. 5(3):452-456. [Engl. summ.]
974. Richard, C., J.A. Fortin, and A. Fortin.
1971. Protective effect of an ectomycorrhizal fungus against the root pathogen *Mycelium radialis atrovirens*. Can. J. For. Res. 1(4):246-251.
975. Richards, B.N.
1961. Soil pH and mycorrhiza development in *Pinus*. Nature 190(4770):105-106.
976. Richards, B.N.
1962. Increased supply of soil nitrogen brought about by *Pinus*. Ecology 43(3):538-541. FA24:2022.
977. Richards, B.N.
1965. Mycorrhiza development of loblolly pine seedlings in relation to soil reaction and the supply of nitrate. Plant and Soil 22(2):187-199. FA27:1862.
978. Richards, N.A., A.L. Leaf, and D.H. Bickelhaupt.
1973. Growth and nutrient uptake of coniferous seedlings: Comparison among ten species at various seedbed densities. Plant and Soil 38(1):125-143. BA56:31324.
979. Richardson, S.D.
1953. A note on some differences in root-hair formation between seedlings of sycamore and American oak. New Phytol. 52(1):80-82. BA28:4208.

980. Richardson, S.D.
1953. Studies of root growth in *Acer saccharinum* L. I. The relation between root growth and photosynthesis. Proc. K. Ned. Akad. Wet. Ser. C. 56(2):185-193. BA28:1884.
981. Richardson, S.D.
1953. Studies on root growth in *Acer saccharinum* L. II. Factors affecting root growth when photosynthesis is curtailed. Proc. K. Ned. Akad. Wet. Ser. C 56(3):346-353. FA15:147.
982. Richardson, S.D.
1954. Root growth of *Acer saccharinum* seedlings during winter. Proc. 8th Int. Bot. Congr., [Paris 1954], Part 5, Section 11, p. 303-304. FA16:233.
983. Richardson, S.D.
1955. The influence of rooting medium on the structure and development of the root-cap in seedlings of *Acer saccharinum* L. New Phytol. 54(3):336-337. BA30:29554.
984. Richardson, S.D.
1956a. On the role of the acorn in root growth of American oak seedlings. Meded. Landbouwhogeschool Wageningen. 56(12):1-18. BA32:17509.
985. Richardson, S.D.
1956b. Studies of root growth in *Acer saccharinum* L. III. The influence of seedling age on the short-term relation between photosynthesis and root growth. IV. The effect of differential shoot and root temperatures on root growth. Proc. K. Ned. Akad. Wet. Ser. C 59(3):416-438. FA18:209.
986. Richardson, S.D.
1956c. Studies of root growth in *Acer saccharinum* L. V. The effect of a long-term limitation of photosynthesis on root growth rate in first-year seedlings. Proc. K. Ned. Akad. Wet. Ser. C 59(5):694-701. FA18:3788.
987. Richardson, S.D.
1957. Studies of root growth in *Acer saccharinum* L. VI. Further effects of the shoot system on root growth. Proc. K. Ned. Akad. Wet. Ser. C 60(5):625-629. FA19:2815.
988. Richardson, S.D.
1958a. Bud dormancy and root development in *Acer saccharinum*. In The physiology of forest trees. A symposium. K.V. Thimann, ed. Maria Moors Cabot Found. for Bot. Res. Int. Symp. For. Tree Physiol., Harvard Univ., Cambridge, Mass., Ronald Press Co., New York. p. 409-425.
989. Richardson, S.D.
1958b. The effect of IAA on root development of *Acer saccharinum* L. Physiol. Plant. 11(4):698-709. BA33:19383.
990. Richardson, S.D.
1961. Some root-shoot interrelationships. In Recent advances in botany. Proc. 9th Int. Bot. Congr., [Montreal 1959], 2:1321-1323.
991. Riedacker, A.
1976. Étude bibliographique: Rythmes de croissance et de régénération des racines des végétaux ligneux. [Bibliographic study: Rhythms of growth and of root regeneration of woody plants.] Ann. Sci. For. 33(3):109-138. [Engl. and Ger. summ.] BA64:16914.
992. Riffle, J.W., and F.C. Strong.
1960. Studies in white pine seedling root rot. Mich. Agric. Exp. Stn. Q. Bull. 42(4):845-853. FA22:710.
993. Riley, C.G., W.B. Denyer, and R.D. Whitney.
1952. 'Littleleaf' of white elm. Can. Dep. Agric. Entomol. Branch Annu. Rep. For. Insect and Dis. Surv. 1951:142. FA14:393.
994. Rishbeth, J.
1972. Resistance to fungal pathogens of tree roots. Proc. R. Soc. Lond., B. 181(1064):333-351. FA34:385.
995. Roberts, B.R., and L.R. Schreiber.
1977. Influence of Dutch elm disease on resistance to water flow through roots of American elm. Phytopathology 67(1):56-59.
996. Robertson, G.I.
1969. Root rot resistant trees and shrubs. N.Z. Gard. 26(9):34-35, 37. FA31:6679.
997. Rodriguez-Barrueco, C.
1969. The occurrence of nitrogen-fixing root nodules on non-leguminous plants. Bot. J. Linn. Soc. 62(1):77-84. FA31:2173.
998. Rodriguez-Barrueco, C.
1971. [The effect of combined nitrogen on the development of nodules and the growth of *Elaeagnus angustifolia*.] An. Edafol. Agrobiol. 30(1/2):149-161. [In Span. with Engl. summ.] FA33:4054.
999. Röhrig, E.
1967. Root development of forest trees in relation to ecological conditions—Part I and II. [Die Wurzelentwicklung der Waldbäume in Abhängigkeit von den ökologischen Verhältnissen—I. and II. Teil.] Transl., Can. Dep. Sec. State Transl. Bur., Foreign Lang. Div. from Forstarchiv 37(10):217-229, 37(11):237-249 (1966). FA29:291 (Transl. Dep. For. Can. 101).
1000. Romberg, L.D., and C.L. Smith.
1938. Effects of indole-3-butyric acid in the rooting of transplanted pecan trees. Proc. Am. Soc. Hort. Sci. 36:161-170. BA13:13987.
1001. Rosendahl, R.O.
1942. The effect of mycorrhizal and non-mycorrhizal fungi on the availability of difficultly soluble potassium and phosphorus. Proc. Soil Sci. Soc. Am. 7:477-479.
1002. Ross, W.D.
1976. Relation of aspen root size to infection by *Ganoderma applanatum*. Can. J. Bot. 54(8):745-751.
1003. Roth, E.B., T.S. Buchanan, and G.H. Hepting.
1948. A five-year record of littleleaf on thirty-one plots. For. Path. Spec. Release U.S. Div. For. Path. 32. FA10:2991.
1004. Roth, E.R.
1952. Roots of living *Pinus rigida* decayed by *Fomes annosus*. Plant Dis. Rep. 36(8):330. FA14:2386.
1005. Roth, L.F., and A.J. Riker.
1943. Influence of temperature, moisture, and soil reaction on the damping-off of red pine seedlings by *Pythium* and *Rhizoctonia*. J. Agric. Res. 67(7):273-293.
1006. Routien, J.B., and R.F. Dawson.
1943. Some interrelationships of growth, salt absorption, respiration, and mycorrhizal development in *Pinus echinata* Mill. Am. J. Bot. 30(6):440-451.
1007. Rowan, S.J.
1960. The susceptibility of 23 tree species to black root rot. Plant Dis. Rep. 44(8):646-647. BA36:38796.
1008. Rudolf, P.O.
1937. Diagnosing plantation mortality. Pap. Mich. Acad. Sci. Arts and Lett. 23:333-338. BA12:7066.
1009. Rudolf, P.O.
1939. Why forest plantations fail. J. For. 37(5):377-383. FA1:162.
1010. Rudolf, P.O.
1950. Forest plantations in the Lake States. USDA Tech. Bull. 1010.
1011. Ruehle, J.L.
1961. Investigation of the relationships of plant-parasitic nematodes to the stunting of pines in outplantings. Diss. Abstr. 22(1):22-23. FA23:2468.
1012. Ruehle, J.L.
1965. Host range studies of several plant-parasitic nematodes found in southern pine forests. (Abstr.) Nematologica 11(1):45. FA27:2569.
1013. Ruehle, J.L.
1966. Nematodes parasitic on forest trees. I. Reproduction of ectoparasites on pines. Nematologica 12(3):443-447.
1014. Ruehle, J.L.
1969. Influence of stubby-root nematode on growth of southern pine seedlings. For. Sci. 15(2):130-134. FA31:1093.

1015. Ruehle, J.L.
1969. Nematodes parasitic on forest trees. II. Reproduction of endoparasites on pines. *Nematologica* 15(1):76–80. FA32:4633.
1016. Ruehle, J.L., and D.H. Marx.
1971. Parasitism of ectomycorrhizae of pine by lance nematode. *For. Sci.* 17(1):31–34. FA33:1181.
1017. Ruehle, J.L., and D.H. Marx.
1977. Developing ectomycorrhizae on containerized pine seedlings. USDA For. Serv. Res. Note SE-242.
1018. Ruehle, J.L., and J.N. Sasser.
1960. The relationship of plant-parasitic nematodes to the growth of pines in outplantings. (Abstr.) *Phytopathology* 50(9):652. FA22:2171.
1019. Rushmore, F.M.
1956. Beech root sprouts can be damaged by sodium arsenite treatment of parent tree. USDA For. Serv. Res. Note 57. Northeast. For. Exp. Stn.
1020. Russo, V.M., and W.L. Klarman.
1973. The effect of air and methane gas on root development of *Pinus virginiana* and on mycorrhiza formation with *Amanita rubescens*. (Abstr.) *Phytopathology* 63(7):805. FA35:1380.
1021. Safford, L.O.
1974. Effect of fertilization on biomass and nutrient content of fine roots in a beech-birch-maple stand. *Plant and Soil* 40(2):349–363. BA58:54326.
1022. Safford, L.O.
1976. Seasonal variation in the growth and nutrient content of yellow birch replacement roots. *Plant and Soil* 44(2):439–444. BA62:48431.
1023. Safford, L.O., and S. Bell.
1972. Biomass of fine roots in a white spruce plantation. *Can. J. For. Res.* 2(3):169–172. BA55:25543.
1024. Saksena, H.K., and O. Vaartaja.
1961. Taxonomy, morphology, and pathogenicity of *Rhizoctonia* species from forest nurseries. *Can. J. Bot.* 39(3):627–647. FA23:2241.
1025. Salenius, P.O.
1977. Nutrient concentration in black spruce foliage immediately following fertilization. *Soil Sci. Soc. Am. J.* 41(1):136–139. FA39:48.
1026. Sandburg, D.
1951. The regeneration of quaking aspen by root suckering. M.F. thesis, Univ. Minn.
1027. Sandburg, D., and A.E. Schneider.
1953. The regeneration of aspen by suckering. *Minn. For. Notes* 24.
1028. Santamour, F.S., Jr.
1960. The relation between anatomy and inherent growth potential of hybrid poplars. Diss. Abstr. 21(4):718. FA22:2777.
1029. Santamour, F.S., Jr.
1965. Rooting of pitch pine stump sprouts. *Tree Plant. Notes* 70, p. 7–8. FA27:538.
1030. Santantonio, D., R.K. Hermann, and W.S. Overton.
1977. Root biomass studies in forest ecosystems. *Pedobiologia* 17(1):1–31.
1031. Sasaki, S., and T.T. Kozlowski.
1968. Effects of herbicides on seed germination and early seedling development of *Pinus resinosa*. *Bot. Gaz.* 129(3):238–246. BA50:32959.
1032. Sasaki, S., and T.T. Kozlowski.
1968. Effects of ipazine, EPTC, and 2,4-D on respiration of root tips of red pine (*Pinus resinosa*) plants of different ages. *Adv. Front. Plant Sci.* 21:135–140. BA50:89070.
1033. Schantz-Hansen, T.
1945. The effect of planting methods on root development. *J. For.* 43(6):447–448. BA20:3738.
1034. Schier, G.A.
1972. Apical dominance in multishoot cultures from aspen roots. *For. Sci.* 18(2):147–149. BA54:54456.
1035. Schier, G.A.
1973. Effects of gibberellic acid and an inhibitor of gibberellin action on suckering from aspen root cuttings. *Can. J. For. Res.* 3(1):39–44. FA34:6835.
1036. Schier, G.A.
1973. Origin and development of aspen root suckers. *Can. J. For. Res.* 3(1):45–53. BA56:48894.
1037. Schier, G.A.
1973. Seasonal variation in sucker production from excised roots of *Populus tremuloides* and the role of endogenous auxin. *Can. J. For. Res.* 3(3):459–461. BA57:54623.
1038. Schier, G.A.
1975. Promotion of sucker development on *Populus tremuloides* root cuttings by an antiauxin. *Can. J. For. Res.* 5(2):338–340. BA60:48890.
1039. Schier, G.A.
1978. Variation in suckering capacity among and within lateral roots of an aspen clone. USDA For. Serv. Res. Note INT-241.
1040. Schier, G.A., and R.B. Campbell.
1976. Differences among *Populus* species in ability to form adventitious shoots and roots. *Can. J. For. Res.* 6(3):253–261. BA63:20510.
1041. Schier, G.A., and R.S. Johnston.
1971. Clonal variation in total nonstructural carbohydrates of trembling aspen roots in three Utah areas. *Can. J. For. Res.* 1(4):252–255. BA54:16568.
1042. Schier, G.A., and J.C. Zasada.
1973. Role of carbohydrate reserves in the development of root suckers in *Populus tremuloides*. *Can. J. For. Res.* 3(2):243–250. BA56:63206.
1043. Schmiede, D.C.
1959. Pine root collar weevil. USDA For. Serv. For. Pest Leaflet 39.
1044. Schmitt, D.M.
1954. Early root development in black spruce (*Picea mariana*). (Abstr.) *For. Chron.* 30(1):105. FA15:3348.
1045. Schmitz, H., and L.W.R. Jackson.
1927. Heartrot of aspen with special reference to forest management in Minnesota. *Minn. Agric. Exp. Stn. Tech. Bull.* 50.
1046. Schoeneweiss, D.F., and A.C. Valcarce.
1966. *Fomes annosus* root rot in Illinois pine plantings. *Plant Dis. Rep.* 50(6):446–448. BA47:104379.
1047. Scholten, H.
1968. Factors affecting the infection of black spruce (*Picea mariana* Mill.) transplants by *Cylindrocladium scoparium*. Diss. Abstr. 28B(8):3131. FA29:5821.
1048. Scholtes, W.H.
1953. The concentration of forest tree roots in the surface zone of some Piedmont soils. *Proc. Ia. Acad. Sci.* 60:243–259. FA16:3885.
1049. Schramm, J.R.
1966. Plant colonization studies on black wastes from anthracite mining in Pennsylvania. *Trans. Am. Phil. Soc. (N.S.)* 56(1).
1050. Schreiber, L.R., and B.R. Roberts.
1971. Intraclonal vs. intraseedling variation in *Ulmus americana* L. and *U. pumila* L. *J. Am. Soc. Hort. Sci.* 96(1):115–116. BA52:66258.
1051. Schreiner, E.J.
1949. Can black walnut poison pines? *Morris Arbor. Bull.* 4(11):94–96. FA11:3260.
1052. Schultz, J.D.
1969. The vertical rooting habit in black spruce, white spruce, and balsam fir. Diss. Abstr. Int. 30B(5):1976. FA32:5632.

1053. Schultz, R.P.
1966. The frequency and implications of intraspecific root-grafting in loblolly pine (*Pinus taeda* L.). Diss. Abstr. 26(8):4148. FA28:319.
1054. Schultz, R.P., and F.W. Woods.
1967. The frequency and implications of intraspecific root-grafting in loblolly pine. For. Sci. 13(3):226-239. BA49:16852.
1055. Scott, S.J., and G.W. Hay.
1967. The carbohydrates of the roots of the sugar maple. Can. J. Chem. 45(19):2217-2225. FA29:4582.
1056. Scully, N.J.
1942. Root distribution and environment in a maple-oak forest. Bot. Gaz. 103(3):492-517. BA16:17504.
1057. Secrest, H.C., H.J. MacAloney, and R.C. Iorenz.
1941. Causes of the decadence of hemlock at the Menominee Indian Reservation, Wisconsin. J. For. 39(1):3-12.
1058. Seeliger, I.
1959. Über die Bildung wurzelburtiger Sprosse und das Wachstum isolierter Wurzeln der Robinie (*Robinia pseudoacacia* L.). [On the formation of shoots by roots and the growth of isolated roots in *R. pseudoacacia*.] Flora Allg. Bot. Ztg. 148(2):218-254. BA37:15243.
1059. Seeliger, I.
1967. Versuche zur Knoellchenbildung an isolierten Wurzeln der Robinie (*Robinia pseudoacacia* L.) [Nodule formation experiments on isolated roots of *R. pseudoacacia*.] Flora Allg. Bot. Ztg. 157(6):561-565. BA49:41573.
1060. Seidel, K.W.
1972. Drought resistance and internal water balance of oak seedlings. For. Sci. 18(1):34-40. BA54:19478.
1061. Shapiro, S.
1949. Reversal of polarity in regenerated roots on stem cuttings of *Populus*. (Abstr.) Am. J. Bot. 36(10):803. BA24:13514.
1062. Shapiro, S.
1957. Auxin control of seasonal polarization of root emergence. (Abstr.) Plant Physiol. 32(suppl.):xlii. FA20:441.
1063. Shapiro, S.
1958. The role of light in the growth of root primordia in the stem of the lombardy poplar. In The physiology of forest trees. A symposium. K.V. Thimann, ed., Maria Moors Cabot Found. for Bot. Res. Int. Symp. For. Tree Physiol., Harvard Univ., Ronald Press Co., New York. p. 445-465.
1064. Shaw, K.
1977. Girdling roots common in container-grown plants, wood and forest trees. Arnoldia 37(5):242-247.
1065. Shea, S.R.
1975. Growth and development of jack pine (*Pinus banksiana* Lamb.) in relation to edaphic factors in northeastern Ontario. Diss. Abstr. Int. 36B(5):2048-2049. FA37:4672.
1066. Shenefelt, R.D.
1956. A further note on protecting machine transplanted trees from white grubs. Univ. Wis. For. Res. Notes 25.
1067. Shigo, A.L.
1972. Successions of microorganisms and pattern of discoloration and decay after wounding in red oak and white oak. Phytopathology 62(2):256-259.
1068. Shigo, A.L.
1975. Compartmentalization of decay associated with *Fomes annosus* in trunks of *Pinus resinosa*. Phytopathology 65(9):1038-1039. FA37:2989.
1069. Shirley, H.L.
1932. Does light burning stimulate aspen suckers? II. J. For. 30(4):419-420.
1070. Shirley, H.L.
1941. Restoring conifers to aspen lands in the Lake States. USDA Tech. Bull. 763.
1071. Shirley, H.L.
1945. Reproduction of upland conifers in the Lake States as affected by root competition and light. Am. Midl. Nat. 33(3):537-612. BA19:15518.
1072. Shirley, H.L., and L.J. Meuli.
1939. Influence of moisture supply on drought resistance of conifers. J. Agric. Res. 59(1):1-21. FA1:157.
1073. Shiroya, T., G.R. Lister, V. Slankis, G. Krotkov, and C.D. Nelson.
1962. Translocation of the products of photosynthesis to roots of pine seedlings. Can. J. Bot. 40(8):1125-1135. BA40:16467.
1074. Shoulders, E., and J.R. Jorgensen.
1969. Mycorrhizae increase field survival of planted loblolly pine. Tree Plant. Notes 20(1):14-17. FA31:374.
1075. Šika, A.
1957. Vývoj kořenů ořešáku černého a vlašského v mládí. [Root development in young plants of *Juglans nigra* and *J. regia*.] Sborn. csl. Akad. zemed. (Lesn.) 3(11):769-784. [In Czech. with Russ. summ.] FA19:3949.
1076. Šika, A.
1959. Korenový systém ořešáku černého. [The root system of *Juglans nigra*.] Sborn. csl. Akad. zemed. (Lesn.) 5(3):267-290. [In Czech. with Russ. and Ger. summ.] FA20:4281.
1077. Silverborg, S.B., and R.L. Gilbertson.
1961. *Armillaria mellea* root rot in a northern white pine plantation. Plant Dis. Rep. 45(5):389. BA36:73962.
1078. Silverborg, S.B., J.R. Risley, and A.L. Leaf.
1962. A basal canker disease of eastern white pine. Plant Dis. Rep. 46(4):285-286. FA24:2498.
1079. Sims, H.P.
1964. Root development of jack pine seedlings on burned-over dry sites in southeastern Manitoba. Can. Dep. For. Publ. 1061. FA26:314.
1080. Sims, H.P., and D. Mueller-Dombois.
1968. Effect of grass competition and depth to water table on height growth of coniferous tree seedlings. Ecology 49(4):597-603. FA30:2012.
1081. Sinclair, W.A.
1963. The root- and butt-rot of conifers caused by *Fomes annosus* with special reference to inoculum dispersal and control of the disease in New York. Diss. Abstr. 23(8):2655. BA43:25028.
1082. Sinclair, W.A., E.L. Stone, and C.F. Scheer, Jr.
1975. Toxicity to hemlocks grown in arsenic-contaminated soil previously used for potato production. HortScience 10(1):35-36. FA37:359.
1083. Singer, F.P., and R.J. Hutnik.
1965. Excavating roots with water pressure. J. For. 63(1):37-38. FA26:4876.
1084. Singh, P.
1970. *Armillaria* root rot in a coniferous plantation in Newfoundland. Bi-mon. Res. Notes 26(1):5-6.
1085. Singh, P.
1975. *Armillaria* root rot: Distribution and severity in softwood plantations in Newfoundland. Acta Phytopathol. Acad. Sci. Hung. 10(3-4):389-406.
1086. Singh, P., and N.D. Bhure.
1974. Influence of *Armillaria* root rot on the foliar nutrients and growth of some coniferous species. Eur. J. For. Pathol. 4(1):20-26. FA36:958.
1087. Singh, P., and J. Richardson.
1973. *Armillaria* root rot in seeded and planted areas in Newfoundland. For. Chron. 49(4):180-182.
1088. Skelly, J.M., S.A. Alexander, and C.L. Morris.
1974. Excavation of entire tree root systems reveals higher incidences of *Fomes annosus*. Proc. Am. Phytopath. Soc. 1:155. (Abstr.) FA37:1709.

1089. Skilling, D.
1965. Root rot on conifers in the Lake States. USDA For. Serv., Region 9 Nurserymen's Conf. p. 4-11.
1090. Slankis, V.
1958. The role of auxin and other exudates in mycorrhizal symbiosis of forest trees. *In* The physiology of forest trees. A symposium. K.V. Thimann, ed. Maria Moors Cabot Found. for Bot. Res. Int. Symp. For. Tree Physiol., Harvard Univ., Ronald Press Co., New York. p. 427-443.
1091. Slankis, V.
1961. On the factors determining the establishment of ectotrophic mycorrhiza of forest trees. *In* Recent advances in botany, 9th Int. Bot. Congr. [Montreal 1959] 2:1738-1742.
1092. Slankis, V.
1967. Renewed growth of ectotrophic mycorrhizae as an indication of an unstable symbiotic relationship. 14th Int. Union For. Res. Organ. Congr. Proc. [Munich 1967] Part V, Section 24, p. 84-99. FA29:1989.
1093. Slankis, V., V.C. Runeckles, and G. Krotkov.
1964. Metabolites liberated by roots of white pine (*Pinus strobus* L.) seedlings. *Physiol. Plant.* 17(2):301-313. FA26:126.
1094. Slocum, G.K., and T.E. Maki.
1956a. Exposure of loblolly pine planting stock. *J. For.* 54(5):313-315. FA17:3899.
1095. Slocum, G.K., and T.E. Maki.
1956b. Some effects of depth of planting upon loblolly pine in the North Carolina Piedmont. *J. For.* 54(1):21-25. FA17:2748.
1096. Smerlis, E.
1961. Pathological condition of immature balsam fir stands of *Hylocomium-Oxalis* type in the Laurentide Park, Quebec. *For. Chron.* 37(2):109-115.
1097. Smith, C.L., J. Hamilton, C.J.B. Thor, and L.D. Romberg.
1939. Root composition and top development in large pecan trees headed to various degrees of severity in top working. *J. Agric. Res.* 58:821-842.
1098. Smith, C.L., and J.G. Waugh.
1938. Seasonal variations in the carbohydrate and nitrogen content of roots of bearing pecan trees. *J. Agric. Res.* 57(6):449-460. BA12:14371.
1099. Smith, D.M.
1951. The influence of seedbed conditions on the regeneration of eastern white pine. *Conn. Agric. Exp. Stn. Bull.* 545.
1100. Smith, W.H.
1969. Release of organic materials from the roots of tree seedlings. *For. Sci.* 15(2):138-143. FA31:170.
1101. Smith, W.H.
1970. Root exudates of seedling and mature sugar maple. *Phytopathology* 60(4):701-703. BA51:104146.
1102. Smith, W.H.
1972. Influence of artificial defoliation on exudates of sugar maple. *Soil. Biol. and Biochem.* 4(1):111-113. FA33:3813.
1103. Smith, W.H.
1976. Character and significance of forest tree root exudates. *Ecology* 57(2):324-331.
1104. Smyly, W.B., and T.H. Filer, Jr.
1977. *Cylindrocladium scoparium* associated with root rot and mortality of cherrybark oak seedlings. *Plant Dis. Rep.* 61(7):577-579. BA64:59156.
1105. Snow, A.G., Jr.
1939. Clonal variation in rooting response of maple cuttings. USDA For. Serv. Tech. Note 29. Northeast. For. Exp. Stn.
1106. Spaulding, P.
1952. Root rots of conifers. *In* Important tree pests of the Northeast. New Engl. Sect. Soc. Amer. For. Evans Printing Co., Concord, N.H. p. 138-140.
1107. Spaulding, P., and H.J. MacAloney.
1931. A study of organic factors concerned in the decadence of birch on cut-over lands in northern New England. *J. For.* 29(8):1134-1149.
1108. Speers, C.F.
1974. Pales and pitch-eating weevils: Development in relation to time pines are cut in the Southeast. USDA Serv. Res. Note SE-207. FA37:1786.
1109. Spurr, A.R.
1949. Histogenesis and organization of the embryo in *Pinus strobus* L. *Am. J. Bot.* 36(9):629-641. BA24:24778.
1110. Spyridakis, D.E., G. Chesters, and S.A. Wilde.
1967. Kaolinization of biotite as a result of coniferous and deciduous seedling growth. *Proc. Soil Sci. Soc. Am.* 31:203-210.
1111. Stanek, W.
1967. Natural layering of red spruce in Quebec. *Bi-mon. Res. Notes* 23(6):42.
1112. Starikov, R.
1969. [Features of the growth of the root systems of certain woody species in nurseries.] *Lesn. Hozjajstvo* 22(12):28-30. [In Russ.] FA31:4107.
1113. Stark, R.W.
1959. Studies on the pine root weevil, *Hylobius warreni* Wood, in Alberta (1957). *Can. Dep. Agric. Sci. Serv. Interim Rep., For. Biol. Div. For Biol. Lab. Calgary, Alberta.*
1114. Steinbeck, K., and P.P. Kormanik.
1968. First-year root system development of two clones of yellow-poplar. *Ga. For. Res. Pap.* 55. BA51:63428.
1115. Steinbeck, K., and R.G. McAlpine.
1966. Inter- and intra-specific differences in the root respiration rates of four hardwood species. *For. Sci.* 12(4):473-476. BA48:40797.
1116. Sterner, T.E.
Inhibition of root- and butt-decay fungi by extractives of balsam fir root wood. *Can. J. For. Res.* 4(2):213-221. BA58:33778.
1117. Sterrett, J.P., W.E. Chappell, and G.M. Shear.
1968. Temperature and annual growth cycle effects on root suckering in black locust. *Weed Sci.* 16(2):250-251. BA49:85782.
1118. Sterrett, W.D.
1920. Jack pine. *USDA Bull.* 820.
1119. Stevens, C.L.
1931. Root growth of white pine (*Pinus strobus* L.). *Yale Univ. Sch. For. Bull.* 32. BA9:5697.
1120. Stiell, W.M.
1970. Some competitive relations in a red pine plantation. *Can. Dep. For. Publ.* 1275. BA52:66260.
1121. Stillwell, M.A.
1960. Rootlet recovery in balsam fir defoliated by the spruce budworm. *Bi-mon. Progr. Rep. Div. For. Biol., Dep. Agric. Can.* 16(5):1. FA22(2117).
1122. Stoddard, E.M., A.D. McDonnell, and H.W. Hicock.
1939. *Fomes annosus* on conifers in Connecticut. *Plant Dis. Rep.* 23:385-386.
1123. Stoeckeler, J.H., and C. Arbogast, Jr.
1955. Forest management lessons from a 1949 windstorm in northern Wisconsin and Upper Michigan. *USDA For. Serv. Stn. Pap.* 34, Lake States For. Exp. Stn.
1124. Stoeckeler, J.H., and G.A. Limstrom.
1942. Ecological factors influencing reforestation in northern Wisconsin. *Ecol. Monogr.* 12(2):191-212.
1125. Stone, E.L., Jr.
1974. The communal root system of red pine: Growth of girdled trees. *For. Sci.* 20(4):294-305. BA60:2052.
1126. Stone, E.L., Jr.
1977. Abrasion of tree roots by rock during wind stress. *For. Sci.* 23(3):333-336.

1127. Stone, E.L., Jr., and T. Greweling.
1971. Arsenic toxicity in red pine and the persistence of arsenic in nursery soils. *Tree Plant. Notes* 22(1):5-7.
1128. Stone, E.L., Jr., and R.C. McKittrick.
1976. On the layering of white spruce. *Tree Plant. Notes* 27(1):14.
1129. Stone, E.L., Jr., and M.H. Stone.
1954. Root collar sprouts in pine. *J. For.* 52(7):487-491.
1130. Stone, E.L., Jr., and V.R. Timmer.
1975. On the copper content of some northern conifers. *Can. J. Bot.* 53(15):1453-1456. BA61:2162.
1131. Stone, E.L., Jr., R.R. Morrow, and D.S. Welch.
1954. A malady of red pine on poorly drained sites. *J. For.* 52(2):104-114.
1132. Stone, J.E., and E.L. Stone, Jr.
1975. Water conduction in lateral roots of red pine. *For. Sci.* 21(1):53-60. BA60:34161.
1133. Stone, J.E., and E.L. Stone, Jr.
1975. The communal root system of red pine: Water conduction through root grafts. *For. Sci.* 21(3):255-261. BA61:24909.
1134. Stonecypher, R.W., F.C. Cech, and B.J. Zobel.
1966. Estimates of components of variance and covariance in root and shoot characteristics of loblolly pine after one growing season. *Proc. 8th South. For. Tree Improv. Conf.* 1965, p. 86-95.
1135. Stout, B.B.
1956. Studies of the root systems of deciduous trees. *Black Rock For. Bull.* 15. BA32:17462.
1136. Stout, B.B.
1961. Season influences the amount of backflash in a red pine plantation. *J. For.* 59(12):897-898.
1137. Stout, B.B.
1968. Root systems of deciduous trees. *Proc. 43rd Int. Shade Tree Conf.* 1967, p. 30-39. FA30:3705.
1138. Stoutmeyer, V.T., F.L. O'Rourke, and W.W. Steiner.
1944. Some observations on the vegetative propagation of honeylocust. *J. For.* 42(1):32-36.
1139. Strang, R.M.
1973. The rate of silt accumulation in the lower Peel River, Northwest Territories. *Can. J. For. Res.* 3(3):457-458. FA35:2132.
1140. Strong, F.C.
1941. Root and butt rot in the pinetum at Michigan State College. *Mich. Agric. Exp. Stn. Q. Bull.* 23(3):159-163. FA3:161.
1141. Strong, F.C.
1944. A study of calcium chloride injury to roadside trees. *Mich. Agric. Exp. Stn. Q. Bull.* 27(2):209-224. FA7:390.
1142. Suggs, E.G., and L.F. Grand.
1972. Formation of mycorrhizae in monoxenic culture by pond pine (*Pinus serotina*). *Can. J. Bot.* 50(5):1003-1007. FA34:828.
1143. Sutherland, J.R.
1967. Parasitism of *Tylenchus emarginatus* on conifer seedling roots and some observations on the biology of the nematode. *Nematologica* 13(2):191-196. BA49:10258. FA29:1070.
1144. Sutherland, J.R.
1967. Host range and reproduction of the nematodes *Pratylenchus projectus*, *Pratylenchus penetrans*, and *Tylenchus emarginatus* on some forest nursery seedlings. *Plant. Dis. Rep.* 51(2):91-93. FA29:6060.
1145. Sutherland, J.R.
1967. Failure of the nematode *Aphelenchus avenae* to parasitize conifer seedling roots. *Plant Dis. Rep.* 51(5):367-370. BA48:77293.
1146. Sutherland, J.R.
1969. Feeding of *Xiphinema bakeri*. *Phytopathology* 59: 1963-1965.
1147. Sutherland, J.R., and R.E. Adams.
1964. Host range of *Tylenchorhynchus claytoni* on some forest nursery seedlings. (Abstr.) *Phytopathology* 54(7):749. FA26:1002.
1148. Sutherland, J.R., and R.E. Adams.
1965. The parasitism of red pine and other forest nursery crops by *Tylenchorhynchus claytoni* Steiner. *Nematologica* 10(4):637-643. FA26:5547.
1149. Sutherland, J.R., and J.A. Fortin.
1968. Effect of the nematode *Aphelenchus avenae* on some ectotrophic, mycorrhizal fungi and on a red pine mycorrhizal relationship. *Phytopathology* 58(4):519-523.
1150. Sutton, R.F.
1967. Influence of planting depth on early growth of conifers. *Commonw. For. Rev.* 46(4):282-295. FA29:3821.
1151. Sutton, R.F.
1967. Influence of root pruning on height increment and root development of outplanted spruce. *Can. J. Bot.* 45(9):1671-1682. BA49:10174.
1152. Sutton, R.F.
1968. Ecology of young white spruce (*Picea glauca* (Moench) Voss). *Diss. Abstr.* 29(2):430.
1153. Sutton, R.F.
1969. Form and development of conifer root systems. *Commonw. For. Bur. Tech. Commun.* 7. BA53:57316.
1154. Sutton, R.F., and E.L. Stone, Jr.
1975. White grubs and white spruce establishment. *Tree Plant. Notes.* 26(2):9-11.
1155. Swingle, C.F.
1937. Experiments in propagating shipmast locust. *J. For.* 35(8):713-720.
1156. Szaniawski, R.K., and M.S. Adams.
1974. Root respiration of *Tsuga canadensis* seedlings as influenced by intensity of net photosynthesis and dark respiration of shoots. *Am. Midl. Nat.* 91(2):464-468. BA58:22330. FA37:3466.
1157. Tabor, C.A., and C.B. Davey.
1964. Effects of clay-suspension root-coatings upon the survival and growth of tree seedlings. *Agron. Abstr.* 1964:55.
1158. Tabor, C.A., and C.B. Davey.
1966. Clay-suspension root-coating as antidessicants and rhizospheric nutrient sources. *Proc. Soil. Sci. Soc. Am.* 30(4):516-520. FA28:2184.
1159. Tainter, F.H., and J.D. Walstad.
1977. Colonization of outplanted loblolly pines by native ectomycorrhizal fungi. *For. Sci.* 23(1):77-79.
1160. Taubenhuis, J.J., and W.N. Ezekiel.
1936. A rating of plants with reference to their relative susceptibility to *Phymatotrichum* root rot. *Texas Agric. Exp. Stn. Bull.* 527.
1161. Taylor, J.S., and E.B. Dumbroff.
1975. Bud, root, and growth-regulator activity in *Acer saccharum* during the dormant season. *Can. J. Bot.* 53(4):321-331. FA36:6882.
1162. Tellefsen, M.A.
1922. The relation of age to size in certain root cells and in vein-islets of the leaves of *Salix nigra* Marsh. *Am. J. Bot.* 9(3):121-139.
1163. Tew, R.K.
1970. Root carbohydrate reserves in vegetative reproduction of aspen. *For. Sci.* 16(3):318-320. BA52:1918.
1164. Tew, R.K., N.V. DeByle, and J.D. Schultz.
1969. Intraclonal root connections among quaking aspen trees. *Ecology* 50(5):920-921. BA51:74825.
1165. Theobald, W.F., and W.H. Smith.
1974. Nitrate production in two forest soils and nitrate reduction in pine. *Proc. Soil Sci. Soc. Am.* 38(4):668-672. FA36:1304.
1166. Thimann, K.V., ed.
1958. The physiology of forest trees. A symposium. Maria Moors Cabot Found. for Bot. Res. Int. Symp. For. Tree Physiol., Harvard Univ., Ronald Press Co., N.Y. BA33:19470.

1167. Thomas, H.E.
1934. Studies on *Armillaria mellea* (Vahl) Quel. Infection, parasitism, and host resistance. J. Agric. Res. 48(3):187–218.
1168. Thomas, W.D., Jr.
1941. The mycorrhizal fungi and mycorrhizae of four coniferous plantations in the Rhine Valley. Phytopathology 31:567–569. FA3:103.
1169. Tint, H.
1945. Studies in the *Fusarium* damping-off of conifers. I. The comparative virulence of certain Fusaria. Phytopathology 35:421–439. FA7:930.
1170. Tint, H.
1945. Studies in the *Fusarium* damping-off of conifers. II. Relation of age of host, pH, and some nutritional factors to the pathogenicity of *Fusarium*. Phytopathology 35:440–457. FA7:930.
1171. Tognoni, F., M. Kawase, and A. Alpi.
1977. Seasonal changes in rootability and rooting substances of *Picea glauca* cuttings. J. Am. Soc. Hort. Sci. 102(6):718–720.
1172. Toole, E.R.
1949. White pine blight in the Southeast. J. For. 47(5):378–382.
1173. Toole, E.R.
1960. Root rot of white oak in Arkansas. Plant Dis. Rep. 44(10):783. BA36:50364.
1174. Toole, E.R.
1966. Root rot caused by *Polyporus lucidus* (*Ganoderma lucidum*). Plant Dis. Rep. 50(12):945–946. FA28:5868.
1175. Toole, E.R.
1967. Root rot of southern hardwood trees caused by *Corticium galactinum*. Plant Dis. Rep. 51(6):500–501. BA48:103747.
1176. Toronto, University of.
1961. Effect of substrate depth on the growth of seedlings of *Picea mariana*, *Pinus banksiana*, *Larix laricina*, and *Betula lutea*. Rep. For. Res. Glendon Hall Fac. For. Univ. Toronto 1959/60:7. FA22:2871.
1177. Toronto, University of.
1965. Seedling growth in relation to aeration of the root system. Rep. For. Res. Glendon Hall Fac. For. Univ. Toronto 1964/65:5–6. FA27:5526.
1178. Toumey, J.W.
1929. Initial root habit in American trees and its bearing on regeneration. Proc. Int. Congr. Plant Sci. 1:713–728. BA4:9447.
1179. Towers, B.
1964. Root-contact infections by *Fomes annosus* in a thinned loblolly pine plantation. Plant Dis. Rep. 48(10):767–769. BA46:95920.
1180. Towers, B., and W.J. Stambaugh.
1968. The influence of induced soil moisture stress upon *Fomes annosus* root rot of loblolly pine. Phytopathology 58 (3):269–272. BA49:69698.
1181. Trappe, J.M.
1962. Fungus associates of ectotrophic mycorrhizae. Bot. Rev. 28(4):538–606.
1182. True, R.P., T.M. Judy, and E. Ross.
1955. The intake of solutions by tops of freshly cut oak stumps. Phytopathology 45(8):466. FA17:1626.
1183. Tubbs, C.H.
1963. Root development of yellow birch in humus and a sandy loam. USDA For. Serv. Res. Note LS–33. FA25:3318.
1184. Tubbs, C.H.
1973. Allelopathic relationship between yellow birch and sugar maple seedlings. For. Sci. 19(2):139–145. BA56:66322.
1185. Tubbs, C.H.
1976. Effect of sugar maple root exudate on seedlings of northern conifer species. USDA For. Serv. Res. Note NC–213.
1186. Tubbs, C.H.
1977. Root-crown relations of young sugar maple and yellow birch. USDA For. Serv. Res. Note NC–225.
1187. Turner, L.M.
1936. Root growth of seedlings of *Pinus echinata* and *Pinus taeda*. J. Agric. Res. 53(2):145–149. BA11:16898.
1188. Turner, L.M.
1936. A comparison of roots of southern shortleaf pine in three soils. Ecology 17(4):649–658. BA11:14604.
1189. Turner, P.D.
1962. Morphological influence of exudates of mycorrhizal and non-mycorrhizal fungi on excised root cultures of *Pinus sylvestris* L. Nature 194(4828):551–552. BA40:3445.
1190. United Kingdom Forestry Commission.
1971. Select annotated bibliography on tree root systems, including damage by tree roots. London, UK. For. Comm. Libr. FA34:4460.
1191. U.S. Forest Service.
1908. Tamarack (*Larix laricina* (DuRoi) Koch). USDA For. Serv. Silvical Leaflet 32.
1192. U.S. Forest Service.
1909. Pignut hickory: *Hicoria glabra* (Mill.) Britton. USDA For. Serv. Silvical Leaflet 48.
1193. U.S. Forest Service.
1935. Prolonged exposure of roots causes death of planting stock. USDA For. Serv. Tech. Note 96, Lake States For. Exp. Stn.
1194. U.S. Forest Service.
1951. Protection from fungi: The littleleaf disease of pine. USDA For. Serv. Southeast. For. Exp. Stn. Rep. 1949/50:11–14. FA13:1411.
1195. U.S. Forest Service.
1959. Root grafts in oak. USDA For. Serv. Central States For. Exp. Stn. Annu. Rep. 1958:6–7. FA20:4791.
1196. U.S. Forest Service.
1960. Hybrid poplar growth rates correlated with root anatomy. USDA For. Serv. Northeast. For. Exp. Stn. Annu. Rep. 1959:18. FA21:4069.
1197. U.S. Forest Service.
1960. Root grafts in oaks. USDA For. Serv. Central States For. Exp. Stn. Annu. Rep. 1959:2–3. FA21:4584.
1198. U.S. Forest Service.
1960. Root rots. USDA For. Serv. Northeast. For. Exp. Stn. Annu. Rep. 1959:45–48. FA21:4571.
1199. U.S. Forest Service.
1964. Backflash in sweetgum. USDA For. Serv. Northeast. For. Exp. Stn. Annu. Rep. 1963:22–23. FA26:619.
1200. Urie, D.H.
1966. An analysis of the hydrologic budget in glacial sands under pine and hardwood forests. Diss. Abstr. 26(8):4149–4150. FA28:74.
1201. Ursic, S.J.
1963. Modifications of planting technique not recommended for loblolly on eroded soils. Tree Plant. Notes 57, p. 13–17. FA24:3596.
1202. Ursino, D.J., and G. Krotkov.
1968. The effect of water stress on the translocation of recent photosynthate to the roots of young plants of *Pinus strobus*. Can. J. Bot. 46(10):1327–1329. BA50:32962.
1203. Vaartaja, O.
1957. Effect of *Trichoderma* on tree seedlings and on their pathogens. Bi-mon. Progr. Rep. Div. For. Biol., Dep. Agric. Can. 13(5):1. FA19:1926.
1204. Vaartaja, O., and W.H. Cram.
1956. Damping-off pathogens of conifers and of *Caragana* in Saskatchewan. Phytopathology 46(7):391–397. FA18:367.
1205. Vaartaja, O., and P.J. Salisbury.
1961. Potential pathogenicity of *Pythium* isolates from forest nurseries. Phytopathology 51(8):505–507.

1206. Vaartaja, O., W.H. Cram, and G.A. Morgan.
1961. Damping-off etiology especially in forest nurseries. *Phytopathology* 51(1):35-42.
1207. Van Eck, W.A.
1959. Site and root studies of red pine (*Pinus resinosa* Ait.) plantations in Lower Michigan. Ph.D. thesis, Mich. State Coll. BA35:17177.
1208. Van Groenewoud, H.
1956. A root disease complex in Saskatchewan white spruce. *For. Chron.* 32(1):11-13.
1209. Van Wormer, H.M.
1937. Effect and treatment of girdling roots. *Natl. Shade Tree Conf. Proc.* 13:30-36.
1210. Van Wormer, H.M.
1951. Basic tree ailments augmented by girdling the roots. *Arborist's News* 16(1):2-6. BA25:25246.
1211. Vatkovskii, O.S., T.L. Bystritskaya, and L.A. Grishina.
1971. Biomassa kornevykh sistem eli, duba i gledichii v europeiskoi chasti SSSR. [Biomass of the root systems of the spruce, oak, and honeylocust in the European part of the USSR.] *Biol. Nauk.* 14(9):108-111. BA54:18883.
1212. Vecchierello, H.
1928. A study of the origin and development of the radicle histogens of *Quercus prinus* L. *Cathol. Univ. Am. Contrib.* 8.
1213. Vimmerstedt, J.P.
1968. Root cation-exchange capacity and the mineral nutrition of eastern white pine and eastern redcedar. *Proc. Soil Sci. Soc. Am.* 32(2):289-292. BA49:102122.
1214. Vogt, A.R.
1970. Effect of gibberellic acid on germination and initial seedling growth of northern red oak. *For. Sci.* 16(4):453-459. BA52:36839.
1215. Voigt, G.K.
1953. The effects of fungicides, insecticides, herbicides, and fertilizer salts on the respiration of root tips of tree seedlings. *Proc. Soil Sci. Soc. Am.* 17(2):150-152. BA28:11944.
1216. Voight, G.K.
1955. The effect of applied fungicides, herbicides and insecticides on the content of nutrient elements in tissue of coniferous seedlings. *Proc. Soil Sci. Soc. Am.* 19(2):237-239. FA17:502.
1217. Voigt, G.K.
1966. Phosphorus uptake in young pitch pine (*Pinus rigida* Mill.). *Proc. Soil Sci. Soc. Am.* 30(3):403-406.
1218. Voigt, G.K.
1970. Ion source and ion uptake by pine seedlings. In *Tree growth and forest soils*. C.T. Youngberg, and C.B. Davey, eds., 3rd North Am. For. Soils Conf. Proc., N.C. State Univ., Raleigh, [August 1968], *Oreg. State Univ. Press, Corvallis*, p. 181-191.
1219. Voight, G.K., and G.L. Steucek.
1969. Nitrogen distribution and accretion in an alder ecosystem. *Proc. Soil Sci. Soc. Am.* 33(6):946-949.
1220. Voigt, G.K., B.N. Richards, and E.C. Mannion.
1964. Nutrient utilization by young pitch pine. *Proc. Soil Sci. Soc. Am.* 28(5):707-709. FA26:3425.
1221. Vozzo, J.A.
1969. Endotrophic mycorrhizae found on *Populus deltoides*. *For. Sci.* 15(2):158. FA31:379.
1222. Vozzo, J.A., and E. Hacskeylo.
1964. Anatomy of mycorrhizae of selected eastern forest trees. *Bull. Torrey Bot. Club* 91(5):378-387. FA26:3434.
1223. Vozzo, J.A., and E. Hacskeylo.
1974. Endo- and ectomycorrhizal associations in five *Populus* species. *Bull. Torrey Bot. Club* 101(4):182-186. FA36:3831.
1224. Wagg, J.W.B.
1964. White spruce regeneration on the Peace and Slave River lowlands. *Can. Dep. For. Publ.* 1069.
1225. Wagg, J.W.B.
1967. Origin and development of white spruce root-forms. *Can. Dep. For. Publ.* 1192. BA49:64706.
1226. Wagner, K., and H. Kurz.
1954. Cypress: Root and stem modifications in relation to water. *Fla. State Univ. Stud.* 13(2):18-47.
1227. Wahlenberg, W.G.
1960. Loblolly pine: Its use, ecology, regeneration, protection, growth and management. *Duke Univ. Sch. For.*
1228. Wakeley, P.C.
1953. Progress in the study of pine races. *South. Lumberman* 187(2345):137-140.
1229. Walker, L.C.
1962. The effects of water and fertilizer on loblolly and slash pine seedlings. *Proc. Soil Sci. Am.* 26(2):197-200.
1230. Walker, L.C.
1967. Effects of water level and fertilizer combinations on loblolly and slash pine seedlings. *Tree Plant. Notes* 18(1):10-12. FA28:5234.
1231. Walker, L.C., R.L. Green, and J.M. Daniels.
1961. Flooding and drainage effects on slash pine and loblolly pine seedlings. *For. Sci.* 7(1):2-15. FA22:4224.
1232. Wallis, G.W.
1959. Effect of biocides on the growth of seedlings of monterey pine, black locust, and European alder, and the development of their symbiotrophic organs. *Univ. Wis. For. Res. Notes* 45.
1233. Wallis, G.W.
1961. Infection of Scots pine roots by *Fomes annosus*. *Can. J. Bot.* 39(1):109-121. BA36:28659.
1234. Walstad, J.D., J.B. Hart, Jr., and S.C. Cade.
1973. Carbofuran-clay root dip protects loblolly pine seedlings from debarking weevils. *J. Econ. Entomol.* 66(5):1219-1220. FA35:2346.
1235. Ward, J.C., J.E. Kuntz, and E.M. McCoy.
1969. Bacteria associated with 'shake' in broadleaf trees. (Abstr.) *Phytopathology* 59(8):1056. FA31:2763.
1236. Ware, G.H., and W.T. Penfound.
1949. The vegetation of the lower levels of the floodplain of the South Canadian River in central Oklahoma. *Ecology* 30(4):478-484. FA11:1673.
1237. Wargo, P.M.
1971. Enhanced growth of *Armillaria mellea* on extracts from roots of defoliated sugar maple trees. (Abstr.) *Phytopathology* 61(8):915. FA33:2772.
1238. Wargo, P.M.
1971. Seasonal changes in carbohydrate levels in roots of sugar maple. *USDA For. Serv. Res. Pap. NE-213*. BA55:4731.
1239. Wargo, P.M.
1972. Defoliation-induced chemical changes in sugar maple roots stimulate growth of *Armillaria mellea*. *Phytopathology* 62(11):1278-1283. BA55:51303.
1240. Wargo, P.M.
1974. Lysis of the cell wall of *Armillaria mellea* by enzymes from forest trees. (Abstr.) *Phytopathology* 64(5):588. FA35:7693.
1241. Wargo, P.M.
1975. Estimating starch content in roots of deciduous trees—a visual technique. *USDA For. Serv. Res. Pap. NE-313*. FA37:797.
1242. Wargo, P.M.
1976. Variation of starch content among and within roots of red and white oak trees. *For. Sci.* 22(4):468-472.
1243. Wargo, P.M., J. Parker, and D.R. Houston.
1972. Starch content in roots of defoliated sugar maple. *For. Sci.* 18(3):203-204. BA55:45794.
1244. Warren, G.L.
1956. Root injury to conifers in Canada by species of *Hylobius* and *Hypomolyx* (Coleoptera: Curculionidae). *For. Chron.* 32(1):7-10.

1245. Warren, G.L.
1956. The effect of some site factors on the abundance of *Hypomolyx piceus* (Coleoptera: Curculionidae). *Ecology* 37(1):132-139.
1246. Warren, G.L., and P. Singh.
1970. *Hylobius* weevils and *Armillaria* root rot in a coniferous plantation in Newfoundland. *Bi-mon. Res. Notes* 26(6):55. FA32:6471.
1247. Warren, G.L., and R.D. Whitney.
1951. Spruce root borer (*Hypomolyx* sp.), root wounds, and root diseases of white spruce. *Bi-mon. Progr. Rep. Div. For. Biol., Dep. Agric. Can.* 7(4):2-3. FA13:1386.
1248. Wassink, E.C., and S.D. Richardson.
1951. Observations on the connection between root growth and shoot illumination in first-year seedlings of *Acer pseudoplatanus* L. and *Quercus borealis maxima* (Marsh) Ashe. *Proc. K. Ned. Akad. Wet. Ser. C* 54(5):503-510. FA13:3682.
1249. Watt, A.S., and G.K. Fraser.
1933. Tree roots and the field layer. *J. Ecol.* 21(2):404-414. BA10:128.
1250. Watts, J.G., and J.B. Hatcher.
1954. White grub damage to young pine plantations. *J. Econ. Entomol.* 47(4):710-711. FA16:2009.
1251. Wean, R.E.
1937. The parasitism of *Polyporus schweinitzii* on seedling *Pinus strobus*. *Phytopathology* 27(12):1124-1142.
1252. Weaver, J.E.
1925. Investigations on the root habits of plants. *Am. J. Bot.* 12:502-509.
1253. Weaver, J.E., and J. Kramer.
1932. Root system of *Quercus macrocarpa* in relation to the invasion of prairie. *Bot. Gaz.* 94(1):51-85. BA7:17934.
1254. Webb, D.P.
1976. Effects of cold storage duration on bud dormancy and root regeneration of white ash (*Fraxinus americana* L.) seedlings. *Hort-Science* 11(2):155-157.
1255. Webb, D.P.
1976. Root growth in *Acer saccharum* Marsh. seedlings: Effects of light intensity and photoperiod on root elongation rates. *Bot. Gaz.* 137(3):211-217.
1256. Webb, D.P.
1977. Root regeneration and bud dormancy of sugar maple, silver maple, and white ash seedlings: Effects of chilling. *For. Sci.* 23(4):474-483.
1257. Weidensaul, T.C., and J.R. McClenahan.
1977. Influences of rooting media on containerized tree growth. *Ohio Rep. Res. and Devel.* 62(6):83-86. *Ohio Agric. Res. and Devel. Cent. Wooster.*
1258. Wells, C.G., J.R. Jorgensen, and C.E. Burnette.
1975. Biomass and mineral elements in a thinned loblolly pine plantation at age 16. *USDA For. Serv. Res. Pap.* SE-126. FA37:6932.
1259. Wenger, K.F.
1952. Effect of moisture supply and soil texture on the growth of sweetgum and pine seedlings. *J. For.* 50(11):862-864. FA14:2027.
1260. Wenger, K.F.
1955. Light and mycorrhiza development. *Ecology* 36(3):518-520. FA17:228.
1261. Werner, R.A.
1973. Absorption, translocation, and metabolism of root-absorbed ¹⁴C-Monitor in loblolly pine seedlings. *J. Econ. Entomol.* 66(4):867-872. FA35:1751.
1262. Werner, R.A.
1974. Distribution and toxicity of root-absorbed ¹⁴C-Orthene and its metabolites in loblolly pine seedlings. *J. Econ. Entomol.* 67(5):588-591. FA36:4907.
1263. Werner, R.A.
1975. Bioactivity of Orthene in loblolly pine seedlings. *J. Ga. Entomol. Soc.* 10(2):156-162. FA37:430.
1264. Westing, A.H.
1959. A curious example of natural layering in maple. *Turtax News* 37(2):68. BA33:30926.
1265. Wheeler, C.T.
1971. The causation of the diurnal changes in nitrogen fixation in the nodules of *Alnus glutinosa*. *New Phytol.* 70(3):487-495. FA33:2205.
1266. White, D.P., and B.G. Ellis.
1965. Nature and action of slow release fertilizers as nutrient sources for forest tree seedlings. *Mich. Agric. Exp. Stn. Q. Bull.* 47(4):606-614.
1267. White, D.P., and R.S. Wood.
1958. Growth variations in a red pine plantation influenced by a deep-lying fine soil layer. *Proc. Soil Sci. Soc. Am.* 22:174-177.
1268. White, D.P., G. Schneider, and W. Lemmien.
1975. Regeneration and growth of quality hardwoods on modified sites. *In Forest soils and forest land management.* B. Bernier and C.H. Winget, eds., 4th North Am. For. Soils Conf. Proc., Laval Univ., 1973. Press l'Univ. Laval, Québec. p. 397-415.
1269. White, L.T.
1951. Studies of Canadian Theleporaceae. VIII. *Corticium galactinum* (Fr.) Burt. *Can. J. Bot.* 29(3):279-296. FA13:1331.
1270. Whitford, L.A.
1956. A theory on the formation of cypress knees. *J. Elisha Mitchell Sci. Soc.* 72(1):80-83. BA31:2269.
1271. Whitney, R.D.
1952. Relationship between entry of root-rotting fungi and root-wounding by *Hypomolyx* and other factors in white spruce. *Bi-mon. Progr. Rep. Div. For. Biol. Dep. Agric. Can.* 8(1):2-3.
1272. Whitney, R.D.
1952. Root disease of balsam fir. *Bi-mon. Progr. Rep. Div. For. Biol. Dep. Agric. Can.* 8(5):2.
1273. Whitney, R.D.
1961. Root wounds and associated root rots of white spruce. *For. Chron.* 37(4):401-411. BA38:11599.
1274. Whitney, R.D.
1962. Studies in forest pathology. XXIV. *Polyporus tomentosus* Fr. as a major factor in stand-opening disease of white spruce. *Can. J. Bot.* 40(12):1631-1658. FA24:5180.
1275. Whitney, R.D.
1963a. Artificial infection of small spruce roots with *Polyporus tomentosus*. *Phytopathology* 53(4):441-443. BA44:8242.
1276. Whitney, R.D.
1963b. White birch mortality at Candle Lake, Saskatchewan. *Bi-mon. Progr. Rep., For. Entom. Path. Branch, Dep. For. Can.* 19(1):3. BA45:26215.
1277. Whitney, R.D.
1965. Mycorrhiza-infection trials with *Polyporus tomentosus* on spruce and pine. *For. Sci.* 11(3):265-270. FA27:3552.
1278. Whitney, R.D.
1966. Germination and inoculation tests with basidiospores of *Polyporus tomentosus*. *Can. J. Bot.* 44(10):1333-1343. BA48:51654.
1279. Whitney, R.D.
1967. Comparative susceptibility of large and small spruce roots to *Polyporus tomentosus*. *Can. J. Bot.* 45(11):2227-2229. BA49:31630.

1280. Whitney, R.D.
1972a. Mortality of spruce in Ontario caused by *Polyporus tomentosus* root rot. Bi-mon. Res. Notes 28(6):39-40.
1281. Whitney, R.D.
1972b. Root rot in white spruce planted in areas formerly heavily attacked by *Polyporus tomentosus* in Saskatchewan. Bi-mon. Res. Notes 28(4):24. FA34:1731.
1282. Whitney, R.D.
1977. *Polyporus tomentosus* root rot of conifers. Fish. and Environ. Can. For. Serv. For. Tech. Rep. 18, Great Lakes For. Res. Centre.
1283. Whitney, R.D., W.P. Bohaychuk, and M.A. Briant.
1972. Mycorrhizae of jack pine seedlings in Saskatchewan and Manitoba. Can. J. For. Res. 2(3):228-235. FA34:5048.
1284. Whittaker, R.H.
1961. Estimation of net primary production of forest and shrub communities. Ecology 42(1):177-180.
1285. Whittaker, R.H., and G.M. Woodwell.
1968. Dimension and production relations of trees and shrubs in the Brookhaven Forest, N.Y. J. Ecol. 56:1-25.
1286. Wiant, H.V., Jr.
1966. The concentration of carbon dioxide near the ground under eastern white pine and black spruce trees. Adv. Front. Plant Sci. 16:197-203. FA29:3297.
1287. Wiant, H.V., Jr., and M.A. Ramirez.
1974. Don't plant white pine near walnut! Tree Plant. Notes 25(4):30.
1288. Wichman, J.R.
1973. Uptake, distribution, and degradation of simazine by black walnut and yellow poplar seedlings. Diss. Abstr. Int. 34B(1):13-14. FA36:937.
1289. Wight, W.
1933. Radial growth of the xylem and the starch reserves of *Pinus sylvestris*. A preliminary survey. New Phytol. 32(2):77-96. BA8:6956.
1290. Wilcox, H.E.
1962. Morphological features and growth behavior of the root of red pine, *Pinus resinosa* Ait. (Abstr.) Am. J. Bot. 49(6, part 2):658. BA41:3388.
1291. Wilcox, H.E.
1964. Xylem in roots of *Pinus resinosa* Ait. in relation to heterorhizy and growth activity. In The formation of wood in forest trees. A symposium. M.H. Zimmermann, ed., Academic Press, Inc., N.Y. p. 459-478. BA46:49380.
1292. Wilcox, H.E.
1967. Seasonal patterns of root initiation and mycorrhizal development in *Pinus resinosa* Ait. Proc. 14th Int. Union For. Res. Organ. Congr. [Munich 1967] Part V, Section 24, p. 29-39. FA29:2003.
1293. Wilcox, H.E.
1968. Morphological studies of the root of red pine, *Pinus resinosa*. I. Growth characteristics and patterns of branching. Am. J. Bot. 55(2):247-254. BA49:85785.
1294. Wilcox, H.E.
1968. Morphological studies of the roots of red pine, *Pinus resinosa*. II. Fungal colonization of roots and the development of mycorrhizae. Am. J. Bot. 55(6, part 1):688-700. BA49:112949.
1295. Wilcox, H.E.
1971. Morphology of ectendomycorrhizae in *Pinus resinosa*. In Mycorrhizae. E. Hacskaýlo, ed., First North Am. Conf. on Mycorrhizae, Univ. Ill. [Urbana, April 1969] USDA For. Serv. Misc. Publ., p. 54-68.
1296. Wilcox, H.E., and R. Ganmore-Neumann.
1974. Ectendomycorrhizae in *Pinus resinosa* seedlings. I. Characteristics of mycorrhizae produced by a black imperfect fungus. Can. J. Bot. 52(10):2145-2155. FA36:4537.
1297. Wilcox, H.E., and R. Ganmore-Neumann.
1975. Effects of temperature on root morphology and ectendomycorrhizal development in *Pinus resinosa* Ait. Can. J. For. Res. 5(2):171-175. BA60:48874.
1298. Wilcox, H.E., R. Ganmore-Neumann, and C.J.K. Wang.
1974. Characteristics of two fungi producing ectendomycorrhizae in *Pinus resinosa*. Can. J. Bot. 52(11):2279-2282. FA36:5500.
1299. Wilcox, J.R., and R.E. Farmer, Jr.
1968. Heritability and C effects in early root growth of eastern cottonwood cuttings. Heredity 23(2):239-245. BA49:19477.
1300. Wilde, S.A.
1946. Forest soils and forest growth. Chron. Bot. Co., Waltham, Mass.
1301. Wilde, S.A., and R.O. Rosendahl.
1945. Value of potassium feldspar as a fertilizer in forest nurseries. J. For. 43(5):366-367.
1302. Wilde, S.A., and G.K. Voigt.
1949. Absorption-transpiration quotient of nursery stock. J. For. 47(8):643-645. FA11:865.
1303. Williams, J.R.M.
1958. Root development and height growth of red pine in relation to soil conditions. M.Sc.F. thesis, Univ. Toronto.
1304. Williams, R.D.
1972. Root fibrosity proves insignificant in survival, growth of black walnut seedlings. Tree Plant. Notes 23(2):22-25.
1305. Williamson, A.W.
1913. Cottonwood in the Mississippi Valley. USDA Bull. 24.
1306. Williston, H.L.
1962. Pine planting in a water impoundment area. USDA For. Serv. South. For. Note 137, South. For. Exp. Stn. FA24:5098.
1307. Wilner, J., and E.J. Brach.
1974. Hardiness of roots in relation to shoots of container-grown plants by an electric method. Can. J. Plant Sci. 54(2):281-289. FA36:6118.
1308. Wilson, B.F.
1964. Structure and growth of woody roots of *Acer rubrum* L. Harvard For. Pap. 11. BA47:9524.
1309. Wilson, B.F.
1967. Root growth around barriers. Bot. Gaz. 128(2):79-82. BA48:123727.
1310. Wilson, B.F.
1970. Evidence for injury as a cause of tree root branching. Can. J. Bot. 48(8):1497-1498. FA32:2217.
1311. Wilson, B.F.
1971. Vertical orientation of red maple (*Acer rubrum* L.) roots. Can. J. For. Res. 1(3):147-150. BA53:62982.
1312. Wilson, B.F.
1975. Distribution of secondary thickening in tree root systems. In The development and function of roots. 3rd Cabot symposium. J.G. Torrey and D.T. Clarkson, eds., Academic Press, London, p. 197-219.
1313. Wilson, B.F., and S.B. Horsley.
1970. Ontogenetic analysis of tree roots in *Acer rubrum* and *Betula papyrifera*. Am. J. Bot. 57(2):161-164. BA51:80539.
1314. Wilson, L.F.
1977. A guide to insect injury of conifers in the Lake States. USDA For. Serv. Agric. Handbk. 501.
1315. Wingfield, E.B.
1969. Mycotrophy in loblolly pine. I. The role of *Pisolithus tinctorius* and *Rhizoctonia solani* in survival of seedlings. II. Mycorrhiza formation after fungicide treatment. Diss. Abstr. 29B(8):2707. FA31:373.
1316. Winston, D.A., and G. Schneider.
1977. Conifer establishment by hand seeding on sites prepared with the Bräcke-kultivatoren. Can. For. Serv. Pap. O-X-255, Great Lakes For. Res. Centre.

1317. Wong, T.L., R.W. Harris, and R.E. Fissell.
1971. Influence of high soil temperatures on five woody-plant species. *J. Am. Soc. Hort. Sci.* 96(1):80–83. FA33:2495.
1318. Wood, O.M.
1934. The root system of a chestnut oak. (*Quercus montana* Willd.). *Natl. Shade Tree Conf. Proc.* 10:95–99. BA9:14506.
1319. Wood, O.M.
1939. Relation of the root system of a sprouting stump in *Quercus montana* Willd. to that of an undisturbed tree. *J. For.* 37(4):309–312. BA14:5587.
1320. Woodroof, J.G.
1933. Relation of the root system of pecan trees to nursery and orchard practices. *Ga. Agric. Exp. Stn. Bull.* 176. BA10:14173.
1321. Woodroof, J.G., and N.C. Woodroof.
1934. Pecan root growth and development. *J. Agric. Res.* 49(6):511–530. BA9:19480.
1322. Woodroof, N.C.
1933. Pecan mycorrhizas. *Ga. Agric. Exp. Stn. Bull.* 178.
1323. Woods, F.W.
1960. Biological antagonisms due to phytotoxic root exudates. *Bot. Rev.* 26(4):546–569. FA22:2874.
1324. Woods, F.W.
1962. Root exudates of higher plants: Ecological considerations. *Proc. 13th Int. Union For. Res. Organ. Congr. [Vienna 1961] Part 2(1), Section 21–4/4.* FA24:124.
1325. Woods, F.W.
1970. Interspecific transfer of inorganic materials by root systems of woody plants. *J. Appl. Ecol.* 7(3):481–486. BA52:48136.
1326. Woods, F.W., and K. Brock.
1964. Interspecific transfer of Ca^{45} and P^{32} by root systems. *Ecology* 45(4):886–889. BA46:55571.
1327. Woods, F.W., and R. Martin.
1973. Loblolly pine mycorrhizae in east Tennessee. *Tree Plant. Notes* 24(4):27. FA36:5503.
1328. Woods, F.W., and D. O'Neal.
1965. Tritiated water as a tool for ecological field studies. *Science* 147(3654):148–149.
1329. Woodwell, G.M., R.H. Whittaker, and R.A. Houghton.
1975. Nutrient concentrations in plants in the Brookhaven oak-pine forest. *Ecology* 56(2):318–332. FA37:1483.
1330. Woolsey, T.S., Jr., and H.H. Chapman.
1914. Norway pine in the Lake States. *USDA Bull.* 139.
1331. Worley, J.F., and E. HacsKaylo.
1959. The effect of available soil moisture on the mycorrhizal association of Virginia pine. *For. Sci.* 5(3):267–268. FA21:1549.
1332. Yeager, A.F.
1935. Root systems of certain trees and shrubs grown on prairie soils. *J. Agric. Res.* 51(12):1085–1092. BA10:20447.
1333. Yeager, L.E.
1949. Effect of permanent flooding in a river-bottom timber area. *Ill. Nat. Hist. Surv. Bull.* 25(2). FA12:1543.
1334. Yeatman, C.W.
1955. Tree root development on upland heaths. (G.B.) *For. Comm. Bull.* 21. BA31:12058.
1335. Yelenosky, G.
1964. Tolerance of trees to deficiencies of soil aeration. *Int. Shade Tree Conf. Proc.* 40:127–147.
1336. Yelenosky, G., and C.L. Fergus.
1959. Absorption and translocation of solutions by healthy and wilt-diseased red oaks. *Pa. Agric. Exp. Stn. Bull.* 657. FA23:787.
1337. Yim, K.B.
1962. Physiological studies on rooting of pitch pine (*Pinus rigida* Mill.) cuttings. *Res. Rep. Inst. For. Genet., Suwon.* 2, p. 20–56. FA24:1967.
1338. York, H.H.
1941. Relative susceptibility of young pine trees in artificial and natural stands to various root, root-crown, and butt fungus parasites. (Abstr.) *Phytopathology* 31:25.
1339. York, H.H., R.E. Wean, and T.W. Childs.
1936. Some results of investigations on *Polyporus schweinitzii* Fr. *Science* 84:160–161.
1340. Yorke, J.S., and F.C. Pollett.
1969. Root systems of tamarack growing on peatland. *Bi-mon. Res. Notes* 25(1):2. FA30:5400.
1341. Yotov, T., I. Palashev. V. Nikolov, and Y. Lyapova.
1975. [Planting depth for poplars on sandy strips on the Black Sea coast in south Bulgaria.] *Gorskostop. Nauka* 12(2):23–33. [In. Bulg. with Russ. and Engl. summ.] FA36:7668.
1342. Young, H.E.
1947. Carbohydrate absorption by roots of *Pinus taeda*. *Queensland J. Agric. Sci.* 4(1/2):1–6. FA11:2513.
1343. Young, Harold E., L. Strand, and R. Altenberger.
1964. Preliminary fresh and dry weight tables for seven tree species in Maine. *Maine Agric. Exp. Stn. Tech. Bull.* 12.
1344. Youngman, A.L.
1967. An ecotypic differentiation approach to the study of isolated populations of *Pinus taeda* in south central Texas. *Diss. Abstr.* 27B(9):3006. FA29:173.
1345. Yount, W.L.
1955. Longevity of the oak wilt fungus in oak roots as related to spread through root grafts. *Plant Dis. Rep.* 39(3):256–257. FA16:4247.
1346. Yount, W.L.
1958. Results of root inoculations with the oak wilt fungus in Pennsylvania. *Plant Dis. Rep.* 42(4):548–551. BA33:19520.
1347. Young, W.L., and J.R. Bloom.
1963. Nematodes in nursery plants in Pennsylvania. *Plant Dis. Rep.* 47(5):405–407. FA25:5415.
1348. Zahner, R.
1956. Root development of thinned pines. *USDA For. Serv. South. For. Notes* 101, p. 1–2. *South. For. Exp. Stn.* FA17:3717.
1349. Zahner, R., and N.V. DeByle.
1965. Effect of pruning the parent root on growth of aspen suckers. *Ecology* 46(3):373–375. FA27:448.
1350. Zahner, R., and F.W. Whitmore.
1960. Early growth of radically thinned loblolly pine. *J. For.* 58(8):628–634.
1351. Zak, B.
1955. Inheritance of resistance to littleleaf in shortleaf pine. *USDA For. Serv. Res. Note* 88, Southeast. *For. Exp. Stn.* FA17:1238.
1352. Zak, B.
1956. Experimental air-layering of shortleaf and loblolly pine. *USDA For. Serv. Stn. Pap.* 69, Southeast. *For. Exp. Stn.*
1353. Zak, B.
1957. Resistance to littleleaf in shortleaf pine. *4th Conf. For. Tree Improv. Proc., Athens, Ga.* [8–9 January 1957] p. 41–43.
1354. Zak, B.
1961. Aeration and other soil factors affecting southern pines as related to littleleaf disease. *USDA Tech. Bull.* 1248. FA23:3294.
1355. Zak, B.
1964. Role of mycorrhizae in root disease. *Annu. Rev. Phytopathol.* 2:377–392.
1356. Zak, B., and W.A. Campbell.
1958. Susceptibility of southern pines and other species to the littleleaf pathogen in liquid culture. *For. Sci.* 4(2):156–161. FA20:723.
1357. Zalasky, H.
1974. *Keissleriella emergens*, a perfect state of *Diplodia tumefaciens* in roots of poplar. *Can. J. Bot.* 52(1):11–13. BA58:6478.

1358. Ziegler, H.
1958. Die Bedeutung der Knöllchenbakterien für den Stickstoffhaushalt der Robinie (*Robinia pseudoacacia* L.) [The importance of root nodules in the N economy of *R. pseudoacacia*.] Arch. Forstw. 7(4/5):352-369. [Engl. and Russ. summ.] FA20:1556.
1359. Zinkan, C.G., J.K. Jeglum, and D.E. Harvey.
1974. Oxygen in water culture influences growth and nutrient uptake of jack pine, black spruce and white spruce seedlings. Can. J. Plant Sci. 54(3):553-558. BA59:8188.
1360. Zon, R.
1905. Loblolly pine in eastern Texas, with special reference to the production of cross-ties. USDA For. Serv. Bull. 64.

Appendix

Key

	Subject
IA,B	Root form and relation to vegetative growth
IC	Genetic variation in root growth and development
ID	Periodic and seasonal aspects of root growth and development
IE-1	Influences of moisture, temperature, and soil on root growth and development
IE-1a	Influence of moisture extremes on root growth and development
IE-2	Influence of the shoot on root growth and development
IIA	Uptake and upward translocation
IIB-1	Translocation downward—carbohydrate reservation
IIB-2	Translocation downward—exudation
IIC	Root respiration
IIIA-1	Competition with woody and herbaceous plants
IIIA-2	Root grafting
IIIA-3	Effects of roots on soil
IIIB-1	Symbiotic relations with other than woody and herbaceous plants
IIIB-2a	Diseases of mechanical or undetermined cause
IIIB-2bi	Insect disease
IIIB-2bii	Nematode disease
IIIB-2biii	Fungus disease
IIIB-2biv	Bacteria disease
IV	Root response to nursery and forestry practices

See page iii of the introduction for instructions on the use of the key and the subject index.

Subject Index

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV	
<i>Abies</i> spp.						253					150									554 1181	
<i>Abies balsamea</i>	859 559 67 382 68 71 1052 1343 86 978		68	349 12 859 559 1052		747 740 746 253 939 71	978 20 338	740			690 446 659 658	86 978		859 783 1181	1123 788 871 923 1126	1244 1245 1121 1096 708	792		1122 1269 1272 310 1096 32 579 480 1087 1116 695 1085 696	11	
<i>Acer</i> spp.	830					1210	852				150		601	94 1181 631 324	1318 1209 1141	448	792	207		1209 1210	
<i>Acer negundo</i>	128 1332 830 211 465 509 935 238			1332 128 481 566 568 174 104 755		128 935 15	568				128 446 15 238			809 871			792	996			
<i>Acer nigrum</i>	830																				
<i>Acer pennsylvanicum</i>	830		72																		
<i>Acer rubrum</i>	856 781 763 1178 349 1310 1313 762 830 1130 826 934 828 827 829 114 1200 1309 1343 1308 1135 336 382	828 856	226 72 1326 891 892 890 763 1313 349 1115 566 12 1226 778 482 481 164 1178	763 762 1311 828 114 1309 336 727 349 1115 566 12 1226 778 482 481 164 1178		1226 762 605 763			913 1326	115 724	762 1135 446 658 659			762 826 829 114 779 278 1222 155	292 871 1310 1313 1210			207		934 963	

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Acer saccharinum</i>	1332		1256	983		1333	568			1177	238			779					32	1256
	830		780	174		423					446									
	983		982	104		988					710									
	989		988	1177		989					15									
	238		1254	568		743														
	781			566		747														
				1333		1254														
				481																
				455																
				1332																
				15																
<i>Acer saccharum</i>	908		867	372		372	713	909	1102		372		1184	372	372	209			1240	416
	372		1256	872		371	226	910	1101		1135		1185	867	871	1239			1237	608
	128		462	128		416	72	1243	1103		13			859	131				1239	1241
	1186		437	859		909	467	912			446			637	1210					1246
	1184		1161	174		743	891	1241			690			1181	1209					334
	830		333	909		747	892	1238			658			155	839					
	1101		334	908		1255	890	334			659			779						
	375			372		334		911												
	1135			872																
	382			867																
	1056			481																
	13			1161																
	211			1254																
	559																			
	934																			
	859																			
	781																			
	608																			
<i>Aesculus</i> spp.	547																			
<i>Aesculus glabra</i>	781			128		128														
	128																			
<i>Aesculus octandra</i>					481															
					174															
<i>Alnus</i> spp.	106			135		1300								631						
														135						
														137						
														1181						
														106						
														138						
														139						
<i>Alnus glutinosa</i>	791		999	791	52	791	521	1265			790			777	791					1232
	117		462	790	790	427								790						
				117	427									791						
				777	777									141						
				999										144						
				144										1232						
				140										1265						
														141						
														96						
														142						
														139						
														1181						
														997						

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Alnus glutinosa</i> (con't)															931					
															858					
															521					
															332					
															136					
<i>Alnus rugosa</i>					778										997	871				
					481										1219					
					482										858					
															281					
															139					
<i>Alnus serrulata</i>					174										139					
															631					
															997					
<i>Asimina triloba</i>	781				482															
<i>Betula</i> spp.	755			698			698				755	150		1181	871	448		207		
				1300			1300							807	1210					
							338								839					
							890													
<i>Betula alleghaniensis</i>	372	1022	372	372	372	576		1103		762	372	1184	372	372				1269		934
	1178		956		743	577					710		953	1107				1203		1176
	934		957		747	1022					658		956	889				310		608
	1107		486			72					659		859	503						
	957		559								446		33	209						
	1186		954										622	456						
	762		1176											953						
	486		1183											955						
	1184		575											956						
	559		576											957						
	382		577											958						
	859													237						
	608																			
<i>Betula lenta</i>	1135			116			226				1135		1181	116						
							72				446		1049							
													807							
													810							
<i>Betula nigra</i>			163	163	481	328				163	446		1181							
			328		455					724			810							
					1333															
					778															
					482															
					174															
<i>Betula papyrifera</i>	1107	1313	956	12	743					86	561		956	1107	448	1347	272		934	
	1313		937		747						690		779	209			900		796	
	562		752		562						658		1181	956					1268	
	561		585								659			958						
	946		516								446			237						
	934		1268											1276						
	1343													1313						
	752													410						
	1200																			

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Betula populifolia</i>	1178 762			1049			892 891				762				1049 807 810	1049 410 614		792		
<i>Carpinus caroliniana</i>	781				481 482	605	72							1181					1269	
<i>Carya</i> spp.	134 394 1178 413 182 184			1178 182		134 733 605					184	150		1181 94	839 1210					
<i>Carya cordiformis</i>	781 1178			1178		134 373	226 72													
<i>Carya glabra</i>	1192 547 1135			1192	482		72	462				1135 446								
<i>Carya illinoensis</i>	1178 1320 1321		1320 1321	1320 1321		1097 1320	1098 1097				753			1320 1322 1321 1181 810			1320 514	514	1320 1321 1000	
<i>Carya laciniata</i>			780											780 1181						
<i>Carya ovata</i>	781 544 128 211 375			544 128	481 482	128 134	72							779						
<i>Carya tomentosa</i>	547				481 174 104															
<i>Castanea</i> spp.	547													631					207	
<i>Castanea dentata</i>	1178			1178			72							1181					453 272 1356 207	
<i>Catalpa</i> spp.	509 610				509															171
<i>Catalpa speciosa</i>	465					416														416
<i>Celtis</i> spp.	547 509				482						753									
<i>Celtis laevigata</i>					481 1333 568 566 174															

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Celtis occidentalis</i>	781 1332 465 321			1332	455 565 568 566 174 104		568							321			767	32		171
<i>Cercis canadensis</i>	781 782				481 174 104									782	871 131				1356	
CONIFER	382 68 401 608 375 374	439 462 991	90 301 401 375 991	263	374 1130 462									324 521 94	1209 839 521 375 374 1126	708		231 158 718 1162 101 1089 914 537 866 18 404	839 608	
<i>Cornus</i> spp.					190	666								601	631		448	792 1347		190
<i>Cornus florida</i>	546 1178 660 184			1335 502	481 906 482 1335 174		72 906							155	906		603	89		502
<i>Cornus stolonifera</i>				786	455		786									871				
<i>Corylus</i> spp.	228			228		228 190								1181						190
<i>Crataegus</i> spp.					481 1333 482 174 104									1181	871		792			
<i>Diospyros virginiana</i>	1049				481 1333 482 174 104											1049				
<i>Elaeagnus</i> spp.															137 138					
<i>Elaeagnus angustifolia</i>	509 1332			755 1332							755			997 139	857 871		797			171
<i>Fagus</i> spp.	524 490			524 1249 490		491 492 339					650 150			324 490	839					650

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV	
<i>Fagus</i> spp. (con't)																				94 339	
<i>Fagus grandifolia</i>	859 934 164 559 382 484 1135			859 1135	164 481 482 174	747 934 164 484 1019	226 72 467		1103				484 1135 446		859 1181 1222 545	757 1209 484 871			448 272 207	934 1019	
<i>Fraxinus</i> spp.	195			195	482		851					195	150							324 631 1181 94	606
<i>Fraxinus americana</i>	781 741 382 417 13 1135 908 608		741	755 417 1135 908 236	481 1333 1177 174	1333 747 1177	226 72				13	1135 446		1181 809							796 608 1268 1254 1257 1256
<i>Fraxinus nigra</i>	382				12								710 446								
<i>Fraxinus pennsylvanica</i>	394 238 509 1332 465 321			509 1332 841	455 1226 306 795 565 769 566 568 569 315 558 553 174 552 104	1226 306 795 569 605 558	703 568 569		963		238 15 703	650 963	1323	748 321 809	857 871 131			797	1175		171 795 650 963
<i>Gleditsia triacanthos</i>	238 509 465 781 782 1252 195 321 211			128 195 15 841	482 1335 174 104	128 1138 605	131			1335	238 195 15			782 321	857 1335 871 318				797		
<i>Gymnocladus dioicus</i>	781 782																				782
<i>Hamamelis virginiana</i>	548						72														448 792
HARDWOOD	460 201		439 462	460 375	263 375	991	91 92	462 1241							839 1209	91			615 718		1209 1241

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIB- 1	IIB- 2a	IIB- 2bi	IIB- 2bii	IIB- 2biii	IIB- 2biv	IV	
HARDWOOD (con't)	382 375 646		991	646 1021 991				911								1126			101 914		
<i>Ilex opaca</i>				502	482	416 605										1222		792		416 502	
<i>Juglans</i> spp.																				631 1181	
<i>Juglans cinerea</i>	781 1332 465			1332																611 824 458 1323	792
<i>Juglans nigra</i>	781 547 394 1178 128 1332 465 15 413 211 235 924 1304			544 128 1332 90 15 235 1304	481 174 104	128 1268	1288	462			924	753	824 291 925 90 458 1051 175 1323 25 1287 410	40	857 871 319		792	272 454 256	235 1304 1268		
<i>Juniperus</i> spp.	610															1181		792 1347	996		
<i>Juniperus virginiana</i>	1178 509 1332 195 336 71 44 184			1178 1332 195 336 43	481 906 482 174	71 44 1213	906	462			195									906 857 871 923	1007 435 932 933 681 685 574 538
<i>Kalmia latifolia</i>	711 726				711											155		792	259		
<i>Larix</i> spp.	401 978			401			1300 978				724	978	252 150	390 388	631 1181 94	871	1245 1154		251 996		
<i>Larix laricina</i>	946 349 67 382 68 71 297 99 744			946 90 68 297 99	1191 349 730 311 421	744 747 253	338						730 710 446		779 1181	68	1244 708	1147 1148 1144	293 1198	1176	
<i>Liquidambar styraciflua</i>	244 336			244 336	164 481	558 1226	6 568	926					150 1199		1222 735	1210 521		792	1356 1007	795 1199	

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Liquidambar styraciflua</i> (con't)	6			1259	1226	795	870						384	187					1175	
	178			555	482	178	521						446	479					207	
	651				769	651	735							809					996	
					566	555								186					258	
					568	605														
					551															
					557															
					558															
					174															
					553															
					552															
<i>Liriodendron tulipifera</i>	394		669	244	481	268	664	434		1115			601	631	1209	606	792	594		796
	1178		163	872	667		851	268		163			567	324	634			633		734
	244		558	1335	482		226			267			268	155	871			681		1266
	6		267	236	768		6			268				1222	131			685		1257
	734		268	567	769		72			269				642				256		
	669		269	742	1335		870			724								54		
	1114			163	1115		892													
				268	558		890													
					174		1266													
					553		891													
					552		669													
							1288													
<i>Maclura pomifera</i>	509			174	481								195							171
	195				174															
<i>Magnolia</i> spp.								1300												
<i>Magnolia acuminata</i>							266													
<i>Morus</i> spp.															871					171
<i>Morus alba</i>	781			195									195							
	509																			
	195																			
<i>Morus rubra</i>					481	605	1300													
					174															
<i>Nyssa aquatica</i>					482	558	568													
					566		314													
					568															
					558															
					556															
					314															
					174															
					553															
					552															
<i>Nyssa sylvatica</i>	546			727	482	557	557	569												
	727				569	558	558													
					315	174														
					551	552														
					556															
					554															
					557															
					558															

Species	Subject														IV						
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIB- 1		IIB- 2a	IIB- 2bi	IIB- 2bii	IIB- 2biii	IIB- 2biv	
<i>Nyssa sylvatica</i> (con't)					174																
					552																
<i>Ostraya virginiana</i>					482		226							748							
							72														
<i>Picea</i> spp.	1178			524		253	1300				429	150		922	108	1245	792	729		429	
	524			212		212								1181		708	1347	192		108	
	559			90										815			1145				
	437			437																	
				815																	
<i>Picea abies</i>	999	627	999	999	349	558	512	462		627	1	446	700	512	700	1244	1143	347		1151	
	375		462	450	700	53	1	700			755			450	834	1246	792	594		416	
	349		700	700	731	755	1302				619			812	871	340	1147	1122		755	
	649		543	90	558	700	712				978			700	923	1085	1148	293		352	
	755			417	53	939	978							771	131		1144	272		1266	
	700			301		1150	1086							324				264		1150	
	509			619			799							1168				266		483	
	417			301			483							922				1204			
	619			401			724							1181				615			
	930			627										680				32			
	1083			117														680			
	401			799														117			
	117																	1084			
	543																	1246			
	1023																	166			
	978																	167			
	592																	1087			
																		1086			
																		478			
																		602			
																		1085			
<i>Picea glauca</i>	946		874	29	12	386	890			1071	690			1181	68	1271	792	489		1193	
	229		361	1208	600	375	892			86	446			1277	1247	1247	459	347		1033	
	67		864	386	1224	746	891			1080	344			516	1271	1244	1144	1271		875	
	68			1224	873	864	978			978				37	1123	1245	1143	560		1150	
	1071			873		747	1086			344					1208	1273	1146	1204		876	
	600			1225		214	1359								759	1274		920		1151	
	874			1080		215	593								1273	1152		310		1152	
	873			1152		253									901	1246		615		608	
	86			1052		939									871	1154		1205		361	
	1225			343		71									923			1273		299	
	1151			1139		600									502			901		502	
	375			1359		1224												1281			
	1152			516		1150												1086			
	608			68		621												1085			
	343			299		1139												32			
	46			344		1128												1274			
	1023																	31			
	978																	1275			
	344																	1277			
																		1278			
																		1279			
																		917			
																		1084			
																		1246			
																		879			
																		1281			

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Picea glauca</i> (con't)																				1087
																				478
																				880
<i>Picea mariana</i>	946		68	421	12	746	338			731	1080	690	927	1181	68	1244	1144	1269		1176
	67			68	873	747	978			1286	978	446		971	759		1143	310		607
	382			731		253	1359							974				32		1316
	68			10		408	1130											31		
	719			1176		105												30		
	564			564		939												1275		
	873			311		421												1047		
	402			873		71												974		
	46			784		720												1280		
	978			1080		99												1087		
	1316			720		311												85		
				1044		607												972		
				402		1128												1085		
				1052														880		
				49																
				607																
				47																
				48																
				1359																
<i>Picea rubens</i>	859			859		1111						446		859	788		1147	1269		
	382													783			1148	1087		
	1343													1181			1144	1085		
																	1143			
<i>Pinus</i> spp.	498			524	273	253	1090	1073	1090	1073	429	150	601	498	108	1245	792	922		429
	497			497		849	849	849				849	388	497		708	1145	729		108
	182			301										922				192		
	849			975										631				688		
	610			617										1090						
	617			815										1091						
														975						
														1181						
														701						
														849						
														1092						
														138						
														617						
														815						
														94						
<i>Pinus banksiana</i>	946	835	623	946	1072	744	775	65	1100	699	599	690		775	1008	1010	915	489		599
	1118		375	1118	12	864	1300			1215	2	446		843	767	1244	916	346		1193
	2		361	860	873	747	1302			731	230			280	1123	448	674	952		1009
	229		377	230		408	1216				422			1181	915	1043	459	233		1124
	230			1124		71	280				1071			701	916	916	74	1122		1033
	509			1301			835				1079			812	385	674	1144	387		1215
	1332			297			864				1080			1283	217	675	676	293		1216
	67			699			385							516		625	1143	842		1176
	68			731			1359							810		207		1204		608
	1124			1176			396											1203		361
	608			10														32		1316
	46			873												708		537		217
	377			1079														1280		
	396			1080														920		
	422			47														310		

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Pinus banksiana</i> (con't)	719			48																915
	767			516																916
	1071			1359																1206
	623			377																1205
	297			1065																900
	305																			615
	873																			288
	1079																			674
	1200																			675
	375																			84
	865																			917
	1065																			880
	1316																			
<i>Pinus echinata</i>	789	23	1187	1188	481	656	1006	597		1006	244	789		578	595	606	517	595		275
	244	22	960	244	580	270	6			724	870	446		1006	580	270	792	1194		796
	653		578	653	1306	1165	666							810	1194		1147	254		739
	578		124	960	174	939	656							1354	254		1012	517		738
	6			21		733	1302							188	451		1148	1353		110
	656			254		1129	870							189	517		1013	1356		
	254			1259		1352	1165							1181	1353		1015	158		
	1259			1048										802	1354		596	1007		
	1048			451										816	533		1016	1354		
	1227			1356										803	534		73	612		
	597			1354										804	597			804		
	127			127										817	521			818		
	124			1165										818				811		
				110										805				805		
				124										812				806		
														820				899		
														1016				533		
														806				160		
														679				334		
														73				932		
														807				515		
														110				933		
														809				1046		
																		816		
																		207		
																		112		
																		803		
																		817		
																		996		
																		681		
																		940		
																		73		
																		688		
<i>Pinus pungens</i>																				1181
<i>Pinus resinosa</i>	1330		836	860	1072	452	756	1073	8	1215	4	690	1051	498	452	416	792	879	416	
	498		1290	29	12	416	1001	662			1071	252	175	322	1008	1010	915	399	1193	
	4		1291	4	836	71	665	663			1136	50	712	324	1141	708	1148	1087	1009	
	295		1292	295	873	853	1301	740			762	1207	715	323	587	1244	1143	1246	1338	
	382		375	1124	1243	836	673				1080	1136	714	1001	1051	1066	1144	940	1124	
	1124		1293	665	1080	744	360				1120	659	25	672	175	448	916	572	1301	
	417		837	417		1293	712				714	801	390	843	1129	1043	674	489	796	
	1071		525	1301		657	661				882	446		1091	834	916	74	346	1033	
	836		381	1129		747	403				978	714		1181	1123	674	676	952	1215	
	1207		376	1267		377	1266				376	1125		680	330	643	1149	322	50	

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV	
<i>Pinus resinosa</i> (con't)	185		377	836			313						378	376	1296	916	625		271	362	
	1290			1207			657						380	1133	807		353		233	836	
	403			51			978						380	1297			626		347	352	
	978			185			593							39			397		594	1266	
	378			376			1132							34			1246		1338	608	
	376			873			1133										831		398	387	572
	380			1293													1277		399	293	45
	762			657													1295		376	1198	1127
	873			307													1149		1085	916	882
	1291			389													1294			615	11
	1083			1080													450			616	381
	1200			450													395			674	38
	1292			116													812			32	
	375			49													1292			30	
	1293			716													887			932	
	307			381													640			933	
	1294			362													1298			207	
	608			377													593			204	
	45			1297													973			973	
	1120			378													38			1068	
	714																36			478	
	381																35			879	
	1297																810			917	
	377																			685	
																				1005	
																				1170	
																				1169	
																				272	
																				587	
																				1269	
																				266	
																				1204	
																				560	
																				920	
																				846	
																				158	
																				1007	
																			915		
																			582		
																			1024		
																			31		
																			1081		
																			680		
																			1277		
																			537		
																			8		
																			307		
<i>Pinus rigida</i>	1285	440		860		789	1220		1100	723	789	789		322	383	207	792	322		796	
	440			789		939	1217			78		446		323			1012	323		383	
	724			727		1129	1329			80				789			1013	594		739	
	789			21		41								325			1015	1122		572	
	1329			441		550								1181				266		738	
	441													1220				325			
														1049				158			
														812				204			
													810				572				
																		940			
																			785		

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	iv
<i>Pinus serotina</i>				727	580	1129								1181	580	1108	1012	1007		
				78										810			1013	940		
				79													1015			
				80																
<i>Pinus strobus</i>	406		1119	766	90	452	850	907	1090	1215	1119	903	925	859	452	416	792	489	435	416
	946		641	406	1072	416	665	1073	1093	1286	967	710	390	783	68	1172	428	346	160	1193
	349		68	349	765	758	775	737		627	1071	690	1287	771	1141	1010	1347	322	30	1009
	859		375	859	1131	71	776	736		724	150	150		499	1172	1210	1147	1339	680	1338
	1119		543	460	12	1129	1090	1202			444	444		498	66	1244	1012	1251	933	1033
	498		740	1119	624	919	403	740			151	151		324	1131	1043	1148	231	327	796
	641			3	1202	9	870				445	445		322	1123	249	1013	90	117	776
	497			850		197	1213				152	152		323	560	248	1015	347	681	1210
	760			710		853	978				148	659		850	1078	625		233	685	1215
	851			497		477					762	148		496	403	207		271	56	918
	382			760		744					870	149		497	871	626		594	478	352
	68			90		747					149	446		851	896	896		1122	160	875
	417			851							978			1168	1287	1108		1338	32	608
	1071			68										775	923	1154		1140	932	56
	1109			665										776	614	340		519	515	1257
	918			417										843	131	708		272	633	877
	583			1099										1090	1126			264	204	
	185			1131										476				1269	243	
	403			477										153				205	940	
	930			583										154				206	364	
	1343			185										1091				265	896	
	762			1078										369				266	644	
	117			249										1181				1123		
	999			248										680				560		
	375			117										363				634		
	608			737										737				920		
	543			736										736				717		
	978			450										809				1007		
	896			366										257				992		
	724			821										94				1077		
														812				582		
														450				615		
														367						
														368						
														810						
														831						
														822						
														821						
														366						
														261						
														393						
<i>Pinus sylvestris</i>	649	179	462	90	90	386	1300	462	1090	731	755	446	1051	700	1051	1010	792	90		416
	700	180	700	619	999	53	712	700		627	1249		712	498	266	1244	1347	594		1334
	498		1289	317	53	308	1090	1289		724	619		390	324	871	1245	1147	1122		902
	509		999	1334	558	379	395				978			1168		1043	1148	293		179
	619		179	731	799	416	978							922		625	1144	922		608
	728		375	386		700	799							728		207	1143	272		572
	317		543	401		939	177							843		626		1204		287
	1334			627		386								144		1246		1203		
	902			999										1090		1085		615		
	401			117										1189		708		1206		
	999			370										1181		868		1205		
	117			378										395				1024		
	179			177										812				1233		
	608													810				514		

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Pinus sylvestris</i> (con't)	375																			162
	370																			117
	1023																			572
	308																			1246
	543																			1085
	978																			785
	377																			
	724																			
<i>Pinus taeda</i>	724	1228	1187	1360	481	656	664	1260	965	78	245	845	976	1017	595	606	517	322	803	416
	1360	430	960	244	906	82	665	430		80	894	1053	567	242	938	1250	488	595		796
	244	193	578	960	580	146	1341	477		163	798	446		239	906	530	487	1194		1094
	653	722	82	336	482	1227	673	431		724	1348	1054		110	580	581	1227	264		1348
	578	1134	968	42	430	431	656	432		75	1227			821	1194	1262	1018	254		1095
	245	102	1227	665	172	433	861	433			1350			807	254		1011	517		463
	336	1344	119	938	194	722	668	505			87			1327	517		1012	325		118
	660	5	669	21	174	1165	82	504			870			751	451		1013	754		1350
	656	194	121	82	199	416	671	965			5			813	168		1015	1356		1229
	938		122	1259	624	1129	172	508						812	290		1014	158		119
	7		124	254	1230	1095	870							322	1227		1016	1227		1201
	1259		284	1048	193	1352	24							323	1354		702	732		1157
	254		926	451	1306	770	892							578	255			1007		739
	1048			78	1229	968	890							1341	533			1354		432
	146			290	1231		929							672	213			160		1158
	463			157			891							668	534			533		506
	80			500			669							1260	521			534		1262
	1258			163			284							325	749			996		1263
	1227			750			163							476	116			682		110
	118			751			943							1227	751			683		102
	929			262			1261							1354	292			536		1230
	120			821			1165							975	506			681		505
	193			170			1262							188				805		157
	855			823			1263							1181				685		126
	669			477			234							189				684		504
	722			1227										119				940		283
	127			118										977				648		500
	123			1354										810				56		764
	617			975										257				539		56
	124			255										809				686		943
	157			87										822				530		702
	723			391										1159				687		738
	926			977										75				16		1261
	949			855										833				538		844
	885			121										94				535		507
				127										240				847		508
				392										241				932		203
				749										808				1179		1017
				617										130				933		
				124										814				514		
				116										702				1046		
				567										943				162		
				764										1016				848		
				813										802				820		
				687										816				207		
				1165										964				749		
				110										962				1180		
				75														821		
																		822		
																		811		
																		803		
																		17		

Species	Subject																								
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV					
<i>Pinus taeda</i> (con't)																				1088	55	899	18	688	
<i>Pinus virginiana</i>	629			629	481			477			894		567	629	595			792	595					775	
				21	174								415	775	383			1147	1007						
				476										631	415			1012	612						
				567										470				1148	932						
				816										475				1013	514						
														476				1015	933						
														1181										681	
														1222										685	
														1049										940	
														812											
														807											
														821											
														257											
														822											
														809											
														810											
<i>Platanus</i> spp.															1181	839									
<i>Platanus occidentalis</i>			418	128	481	795	568				870			94					1125				795		
				568	778	568	569							809					681				418		
					482	418	870												685						
						565	128																		
						568																			
						566																			
						569																			
						315																			
						558																			
						553																			
						174																			
						552																			
						104																			
<i>Populus</i> spp.	869	1196		1300							14	150	282	94	839	448	792	1269							
	1196	1028		93											1123			310							
	1028														871										
	501														501										
<i>Populus alba</i>	405	405		755										1181	871										
				405																					
				841																					
<i>Populus balsamifera</i>	946		176	946	12	176								1181											
	176					298																			
	869					948																			
	465					1040																			
	1070																								
	298																								
<i>Populus deltoides</i>	1305	1028	462	1305	1332	1305	568	462			15			748	1235	863	797	32	1235	171					
	1332	1299		128	455	795	799							1221	871			863						795	
	1236	358		15	1333	1028								1223										1341	
	1028			1236	482	568																		419	
	358				568	565	165																		
	64				173	566	1299																		

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Populus deltoides</i> (con't)	501			1341	568	427														
					358	1040														
					173															
					174															
					104															
					427															
					961															
<i>Populus deltoides</i> var. <i>occidentalis</i>																				
																				128
<i>Populus grandidentata</i>	335			356		357	226				77	690		1223						
	1070			77		335	72					304		807						
	356			1049		76	661					446		810						
	1349					355						793								
	77					356														
	793					303														
						304														
						1349														
						563														
						77														
						1049														
						793														
<i>Populus nigra</i> var. <i>italica</i>	1061		1062			1063								1181	871					
						1062														
<i>Populus tremuloides</i>	62	1163	176	296	12	1039	226	1163		724	762	710		1181	614				1045	348
	176	1041		109		1038		1041			77	690		680					680	
	382	1042		356		1035		1042			1164	304		1049					1357	
	1070			77		1042						446		1223					1002	
	296			1049		523						793		807						
	1027			424		1163								810						
	109			425		793														
	191			1164		424														
	356					1034														
	449					357														
	598					425														
	762					61														
	1343					62														
	77					1045														
	424					645														
	794					1069														
	793					176														
	609					296														
	724					1027														
						1040														
						1036														
						103														
						522														
						1041														
						1164														
						794														
						76														
						191														
						348														
						356														
						355														
						303														
						449														

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Populus tremuloides</i> (con't)						304 563 190 77 1049 948														
<i>Prunus</i> spp.	547			898									601			448	792	1269		
<i>Prunus pensylvanica</i>	382																			
<i>Prunus virginiana</i>	229 1332			1332																
<i>Prunus serotina</i>	382 762 181	181		872 72	482 174		226 72				762	710 446		809						
<i>Quercus</i> spp.	547 652 1178 653 245 182 375 184 999 711 1285 1329 1212		375 462	652 182 999 711 566	104 481 482 174 566	838 711 795	852 1329 145	462			245	690 691 692 329 150	282 1323 324	779 324 631 1181 807	839 966 1141 1210 573	448	792	652 222 690 691 1269	966 329 1268 795 1209	
<i>Quercus alba</i>	394 652 1178 244 245 336 1056 660 414 220 156 1135 854 184 1285 183 706 1329 787		780	652 1178 244 336 414 220 156 1135 706 707	481 906 156 1060 104 707 103	733	851 226 72 1329	1241 1242 787		787	245	98 1135 693 1195 613 446		779 780 220 1181 239 240 241 810	652 906 573 871		792	272 98 169 208 693 1173 613 113 1175 454 1067 1240	1241 1242	
<i>Quercus bicolor</i>	220			220	455 104									220					169	

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV	
<i>Quercus coccinea</i>	1178 156 1285 183 1329			1178 156	156		1329							159 586 446						272 169 159 493	
<i>Quercus ellipsoidalis</i>	305						611							98 693 329 659 446						98 169 693 329	329
<i>Quercus falcata</i>					481 174								159	1181 145						169 159	
<i>Quercus falcata</i> var. <i>pagodaefolia</i>					565 566 174															169 1104	
<i>Quercus lyrata</i>	656				481 906 482 174	656	656														
<i>Quercus macrocarpa</i>	544 1253 1332 509 274 13 211 305 403 854			544 128 509 274 15	1332 455 12 104	128	661				15 13	1253 690 691 98		748 1253 326 1181	403					272 690 691 98 169 693 881	
<i>Quercus marilandica</i>	244 336 156 711			244 336 156 711	481 156 174	733 711		1325				1195 613 446 753								272 169 613	
<i>Quercus muehlenbergii</i>	781				174															169	
<i>Quercus nigra</i>					481 482 174								446							169 208 1175	
<i>Quercus palustis</i>	202 220			220 568	164 455	568 569	568							220 810				792 1337	272 169	202	
<i>Quercus prinus</i>	1318 1319			1135	481 906	1319	851 906	909				1135 446		1181	906			1147 1148	272 169	1319	

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Quercus prinus</i> (con't)	437 1135					909														
<i>Quercus rubra</i>	781 652 1178 544 244 382 336 417 1056 15 13 979 156 220 211 1135 762 117 854 908 608 543 706	462 705 543	133 652 1178 544 128 244 336 417 455 156 220 1135 117 908 705 709 707 706	15 906 156 12 1177 1060 707 799	133 128 219 906 359 799	664 756 226 72 906 799	462 359 1241 1242				133 13 762 1346 1336 159 446	1182 1135 693 1346 1049 614		779 220 1181 871 1049 614 810	906 1235			652 272 169 693 1346 159 113 454 1067 1240	1235 796 1182 1336 526 608 1214 219	
<i>Quercus stellata</i>	1178 244 336 156			1178 244 336 156	481 156 1060 174	733 1328	345			345		446 753							169	
<i>Quercus velutina</i>	244 336 854			244 336	1060 104	733		1241 913			691 1195 159 613 446		1181 1049 810 913	1209 1235					272 691 169 159 613 493 1240	1235 526 1241
<i>Rhododendron</i> spp.	726																	792 1347	996	
<i>Rhododendron maximum</i>	1284																			259
<i>Rhus</i> spp.																				448
<i>Rhus copallina</i>	335			335		335						446 753								
<i>Rhus glabra</i>												753								
<i>Robinia pseudoacacia</i>	509 195 465 13 660 543	766 543	133 1155 195 72	481 174 416 703	133 416 227 704	72 703	1323 1100			133 195 13 703	446 282 925 588 589 1323	227 588 589 1181 279	857 521 871	606 1147 1148	272					416 171 1215 1232 1317

Species	Subject																			
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV
<i>Salix</i> spp.	1139																			
	501			411	411	1139	1300		52	1115				1181	839	448	792	207		
	723			250	250	246	163			163										
	1178			731	558	218				724										
	1236			93	52	1236														
				1139	481	948														
				1115	455															
				163	174															
				1236																
<i>Salix alba</i>	509		462		558	427		462							871		797	996		
	897				427															
<i>Salix nigra</i>	724			95	481	1162	568			1115										795
				568	455	1333				724										
				1115	1333	795														
					482	568														
					568															
					566															
					174															
					104															
<i>Sassafras albidum</i>	547			481	335			415			446	415								
	335			482	733															
	415			174																
				104																
<i>Taxodium distichum</i>	825			825	312	416	1300			673				94	825			1007		416
	312			312	1178	694	314								906			996		314
	1178			198	198	198														
	198			309	481	1226														
	673				906															
	309				673															
					694															
					1226															
					314															
					174															
<i>Thuja</i> spp.						253					150			923	708					
<i>Thuja occidentalis</i>	859	469	68	859		746					710		859	68			792	884		416
	68		70	860		747					658		884	276			1144	1269		201
	70		375	939		416					659			884				1206		
	382			68		939					446			1123				1024		
	69			70		69								871				192		
	71			884		71								319				32		
	276			469		884												30		
	884			878														1089		
	437																			
	469																			
	375																			
	878																			
<i>Tilia</i> spp.				481						1335		150		1181	1335					
				1335																
<i>Tilia americana</i>	781		462	544	12	58	851	462			15	710		779		448		1269		59
	544		780	1332	58	745	226					446		780						608
	1332		59	15	1177	59	72							1181						
	382			72	174	74	57							905						
	211			872																

Species	Subject																				
	IA,B	IC	ID	IE- 1	IE- 1a	IE- 2	IIA	IIB- 1	IIB- 2	IIC	IIIA- 1	IIIA- 2	IIIA- 3	IIIB- 1	IIIB- 2a	IIIB- 2bi	IIIB- 2bii	IIIB- 2biii	IIIB- 2biv	IV	
<i>Tilia americana</i> (con't)	58 608			57																	
<i>Tsuga</i> spp.												150		1181	839						
<i>Tsuga canadensis</i>	407 1178 68 382 1343 930 375 724		68 375	407 1178		747 1156 71	72 1131			724		903 893 658 659 285 446		407 1181	757 1057 68 1123 871 923 1082 131	708	792 1347	452 594 1269 266		1082	
<i>Ulmus</i> spp.	223											150	282	324 1181	839	448	792				
<i>Ulmus alata</i>	781 238 1332 509 201 225 224 382 202 1200 1050					481 778 482 174															
<i>Ulmus americana</i>			462	509 201 90 224 665 15 72 872 568	1332 164 481 455 778 482 306 12	745 747 416 755 568 568	226 1001 665 72 568	462		1335	238 15	710 528 529 883 446 753 227	415	1001 1222	1235 1209 1141 1210 993 1335 415		797	1024 1205 528 32 883 277 995	1235 224 202	416	
<i>Ulmus rubra</i>				72			72														
<i>Ulmus thomasi</i>	608					12															608

NATIONAL AGRICULTURAL LIBRARY



1022205149

NATIONAL AGRICULTURAL LIBRARY



1022205149