Literature Cited

Anon. 1983. Seed list of the Latin American Forest Tree Seed Bank. Turrialba, Costa Rica: Centro Agronomico Tropical de Investigacion y Ensenanza. 10 p.

Anon. 1985. Seed catalogue, January, 1985. Humlebaek, Denmark: DANIDA Forest Seed Centre (appendix 5). [Not paged].

Anderson, Robert L. 1986a. Checklist of microorganisms associated with tree seeds in the world, 1985. Gen. Tech. Rep. SE-39. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 34 p.

Anderson, R.L. 1986b. New method for assessing contamination of slash and loblolly pine seeds by *Fusarium moniliforme* var. *subglutinans.* Plant Disease. 70: 452-453.

Arisman, H.; Powell, G.R. 1986. Effects of cone colour and seed-extraction methods on yield and quality of seeds of *Pinus merkusii* in Indonesia. Seed Science and Technology. 14: 177-190.

Association of Official Seed Analysts. 1983. Seed vigor testing handbook. Contribution No. 32. Handb. on Seed Testing. Association of Official Seed Analysts. 93 p.

Association of Official Seed Analysts. 1988. Rules for testing seeds. Journal of Seed Technology. 12(3): 1-109.

Barner, H.; Olesen, Kirsten. 1984. Seed-crop evaluation. Tech. Note 19. Humlebaek, Denmark: DANIDA Forest Seed Centre. 20 p.

Barnett, James P. 1976. Cone and seed maturation of southern pines. Res. Pap. SO-122. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 11 p.

Barnett, James P. 1979. An easy way to measure cone specific gravity. In: Karrfalt, R.P., comp. Proceedings of the seed collection workshop; 1979 May 16-18; Macon, GA. SA-TP-8. Atlanta, GA: U.S. Department of Agriculture, Forest Service, State and Private Forestry: 21-23.

Barnett, James P.; Vozzo, J.A. 1985. Viability and vigor of slash and shortleaf pine seeds after 50 years of storage. Forest Science. 31: 316-320.

Bawa, K.S.; Webb, C.J. 1984. Flower, fruit and seed abortion in tropical forest trees: implications for the evolution of paternal and maternal reproductive patterns. American Journal of Botany. 71: 736-751.

Bewley, J.D.; Black, M. 1982. Physiology and biochemistry of seeds. Berlin: Springer-Verlag. 681 p. 2 vols.

Blanche, C.A.; Elam, W.W.; Hodges, J.D. and others]. 1988. Accelerated aging of selected tree seeds. In: Physiology and genetics of reforestation: Proceedings of the 10th North American forest biology workshop; 1988 July 20-22; Vancouver, BC. Vancouver, BC: University of British Columbia: 327-334.

Bonner, F.T. 1968. Water uptake and germination of red oak acorns. Botanical Gazette. 129: 83-85.

Bonner, F.T. 1972a. Maturation of sweetgum and American sycamore seeds. Forest Science. 18: 223-231.

Bonner, F.T. 1972b. Measurement of moisture content in seeds of some North American hardwoods. Proceedings of the International Seed Testing Association. 37: 975-983.

Bonner, F.T. 1972c. Technology of eastern tree seed - a 5-year report on research. In: Proceedings of the southeastern forest nurserymen's conference; 1972 July 24-26; Greenville, MS. Atlanta, GA: U.S. Department of Agriculture, Forest Service, State and Private Forestry: 13-21.

Bonner, F.T. 1973. Timing collections of samaras of *Fraxinus pennsylvanica* Marsh in the Southern United States. In: International symposium on seed processing; 1973 September 4-7; Bergen, Norway. Stockholm: Swedish Royal College of Forestry. [Not paged]. Vol. 1.

Bonner, F.T. 1974a. *Fraxinus* L. ash. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 411-416.

Bonner, F.T. 1974b. Maturation of acorns of cherrybark, water and willow oaks. Forest Science. 20: 238-242.

Bonner, F.T. 1974c. Seed testing. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 136-152.

Bonner, F.T. 1975. Maturation of black cherry fruits in central Mississippi. Res. Note SO-205. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 4 p.

Bonner, F.T. 1976. Maturation of Shumard and white oak acorns. Forest Science. 22: 149-154.

Bonner, F.T. 1981a. Collection, conditioning and certification of forest tree seed. In: Khosla, P.K., ed. Advances in forest genetics. New Delhi: Ambika Publications: 60-78.

Bonner, F.T. 1981b. Measurement and management of tree seed moisture. Res. Pap. SO-177. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 11 p.

Bonner, F.T. 1984a. Glossary of seed germination terms for tree seed workers. Gen. Tech. Rep. SO-49. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 4 p.

Bonner, F.T. 1984b. Testing for seed quality in southern oaks. Res. Note SO-306. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 6 p.

Bonner, F.T. 1986a. Cone storage and seed quality in eastern white pine *(Pinus strobus* L.). Tree Planters' Notes. 37 (4): 3-6.

Bonner, F.T. 1986b. Measurement of seed vigor for loblolly and slash pines. Forest Science. 32: 170-178.

Bonner, F.T. 1987a. Effects of storage of loblolly and slash pine cones on seed quality. Southern Journal of Applied Forestry. 11: 59-65.

Bonner, F.T. 1987b. Importance of seed size in germination and seedling growth. In: Kamra, S.K.; Ayling, R.D., comp., eds. IUFRO international symposium on forest seed problems in Africa; 1987 August 23-September 2; Harare, Zimbabwe. Rep. 7. Umea, Sweden: Swedish University of Agricultural Sciences: 53-61.

Bonner, F.T. 1990. Storage of seeds: potential and limitations for germplasm conservation. Forest Ecology and Management. 35: 35-43.

Bonner, F.T. 1991a. Estimating seed quality of southern pines by leachate conductivity. Res. Pap. SO-263. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 4 p.

Bonner, F.T. 1991b. Seed management. In: Duryea, M.L.; Dougherty, P.M., eds. Forest regeneration manual. Dordrecht, Netherlands: Kluwer Academic Publishers: 51-73.

Bonner, F.T.; Agmata-Paliwal, A. 1992. Rapid tests of seed quality in *Picea* species by the leachate conductivity method. In: DeHayes, Donald H.; Hawley, Gary J., eds. Genetics in forest biology: Proceedings of the 1st Northern Forest Genetics Association conference; 1991 July 23-25; Burlington, VT. Berea, KY: Northern Forest Genetics Association: 69-75.

Bonner, F.T.; Dell, T.R. 1976. The Weibull function: a new method of comparing seed vigor. Journal of Seed Technology. 1: 96-103.

Bonner, F.T.; Vozzo, J.A. 1986. Evaluation of tree seeds by electrical conductivity of their leachate. Journal of Seed Technology. 10: 142-150.

Bonner, F.T.; Vozzo, J.A. 1990. Storing recalcitrant tropical forest tree seeds. In: Trivino, D.T.; Jara N., L.F., eds. Memories of the 1988 seminario - taller sobre investigaciones en semillas forestales tropicales; 1988 October 26-28; Bogota, Colombia. CONIF Serie Doc. 18. Bogota: Corporation Nacional Investigation Fomento Forestal: 139-142.

Bramlett, D.L.; Belcher, E.W., Jr.; DeBarr, G.D. [and others'. 1977. Cone analysis of southern pines: a guidebook. Gen. Tech. Rep. SE-13. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 28 p.

Burley, J.; Styles, B.T., eds. 1976. Tropical trees - variation, breeding, and conservation. Linnean Society of London symposium; series 2. London: Academic Press. 243 p.

Campbell, Robert K.; Sorenson, Frank C. 1979. A new basic for characterizing germination. Journal of Seed Technology. 4: 24-34.

Chin, H.F.; Roberts, E.H. 1980. Recalcitrant crop seeds. Kuala Lumpur, Malaysia: Tropical Press. 152

Cibrian-Tovar, David; Ebel, Bernard H.; Yates, Harry 0., III [and others]. 1986. Cone and seed insects of the Mexican conifers. Gen. Tech. Rep. SE-40. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 110 p.

Czabator, Felix J. 1962. Germination value: an index combining speed and completeness of pine seed germination. Forest Science. 8: 386-396.

Daryono, H.; Hamzah, Z.; Trikawan. 1979. Pengaruh berat jenis kerucut *Pinus merkusii* terhadap persen perkecambahan = Influence of the specific gravity of *Pinus merkusii* cones on germination percent. Laporan, Lembago Penelitian Hutan, Indonesia. No. 294. 34 p. Forestry Abstracts. 49(11): 70-72. In Malaysian.

Derr, Harold J.; Mann, William F., Jr. 1971. Direct-seeding pines in the South. Agric. Handb. 391. Washington, DC: U.S. Department of Agriculture. 68 p.

Djavanshir, Karin; Reid, C.P.P. 1975. Effect of moisture stress on germination and radicle development of *Pinus eldarica* Medw. and *Pinus ponderosa* Laws. Canadian Journal of Forest Research. 5: 80-83.

Dobbs, R.C.; Edwards, D.G.W.; Konishi, J.; Wallinger, D. 1976. Guidelines to collecting cones of B.C. conifers. British Columbia Forest Service and Canadian Forestry Service; joint report 3.98 p.

Dogra, P.D. 1983. Reproductive biology of conifers and its application in forestry and forest genetics. Phytomorphology. 33(1-4): 142-156.

Doran, J.C.; Turnbull, J.W.; Boland, D.J. [and others]. 1983. Handbook on seeds of dry-zone acacias: a guide for collecting, extracting, cleaning, and storing the seed and for treatment to promote germination of dry-zone acacia. Rome: Food and Agriculture Organization of the United Nations. 92 p.

Edwards, D.G.W. 1987. Methods and procedures for testing tree seeds in Canada. Forestry Tech. Rep. 36. Ottawa: Canadian Forestry Service. 31 p.

Ellis, R.H.; Hong, T.D.; Roberts, E.H. 1987. The development of desiccation-tolerance and maximum seed quality during seed maturation in six grain legumes. Annals of Botany. 59: 23-29.

Estrada, Alejandro; Coates-Estrada, Rosamond; Vazquez-Yanes, Carlos. 1984. Observations on fruiting and dispersers of *Cecropia obtusifolia* at Los Tuxtlas, Mexico. Biotropica. 16: 315-318.

Fenton, R.H.; Sucoff, E.I. 1965. Effects of storage treatments on the ripening and viability of Virginia pine seed. Res. Note NE-31. Upper Darby, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. 6 p.

Franklin, E. Carlyle, ed. 1982. Pollen management handbook. Agric. Handb. 587. Washington, DC: U.S. Department of Agriculture. 98 p.

Goodchild, N.A.; Walker, M.G. 1971. A method of measuring seed germination in physiological studies. Annals of Botany. 35: 615-621.

Gregg, B.R. 1983. Seed marketing in the tropics. Seed Science and Technology. 11: 129-148.

Grisez, Ted J. 1974. *Prunus* L. cherry, peach, and plum. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 658-673.

Hardin, James W. 1960. Workbook for woody plants. Minneapolis: Burgess. 131 p.

Harrington, James F. 1972. Seed storage and longevity. In: Kozlowski, T.T., ed. Seed biology. New York: Academic Press: 145-245. Vol. 3.

Hartmann, Hudson T.; Kester, Dale E.; Davies, Fred T., Jr. 1983. Plant propagation: principles and practices. 5th ed. Inglewood Cliffs, NJ: Prentice-Hall. 727 p.

Hellum, A.K. [In press]. Tree seed needs in an ASEAN context. In: Proceedings of the IUFRO symposium on seed quality of tropical and sub-tropical species; 1984 May 22-26; Bangkok, Thailand. Bangkok: Kasetsart University.

Hooda, M.S.; Singh, D.P.; Bonner, F.T. [In press]. Use of accelerated aging and leachate conductivity to estimate seed quality in hardseeded leguminous trees. In: Proceedings of the IUFRO symposium on forest seed quality; 1991 October 13-17; Nanjing, China. [Place of publication unknown]: [Publisher unknown].

International Board for Plant Genetic Resources. 1976. Engineering, design, and cost aspects of long-term seed storage facilities. Report of International Board for Plant Genetic Resources working group; 1976; [place of meeting unknown]. Rome: Food and Agriculture Organization of the United Nations. 19 p.

International Seed Testing Association. 1966. Handbook on seed health testing. Proceedings of the International Seed Testing Association (section 3). 30: 1,045-1,115.

International Seed Testing Association. 1985. International rules for seed testing. Seed Science and Technology. 13: 299-520.

Janas, P.S. 1984. A list of seed in the Canadian Forestry Service Seed Bank. Info. Rep. PI-X-39 E/F. Ottawa: Canadian Forestry Service, Petawawa National Forestry Institute. 63 p.

Janssen, J.G.M. 1973. A method of recording germination curves. Annals of Botany. 37: 705-708.

Jian, Chi; Peipei, Sao. 1988. Preliminary study on the development rhythm of cones and seeds of Chinese fir. Forest Research. 1: 445-449. [In Chinese with English summary.]

Johnson, Clarence D. 1983. Handbook on seed insects of *Prosopis* species. Rome: Food and Agriculture Organization of the United Nations. 55 p.

Justice, Oren L.; Bass, Louis N. 1978. Principles and practices of seed storage. Agric. Handb. 506. Washington, DC: U.S. Department of Agriculture. 289 p.

Koasa-ard, Apichart. 1983. Teak *(Tectona grandis* Linn. F.) seed collection zones in Thailand. In: Seed collection units. 1: Seed zones [Circular Letter 19] Humlebaek, Denmark: DANIDA Forest Seed Centre: 15-18.

Khan, A.A., ed. 1984. The physiology and biochemistry of seed dormancy and germination. New York: North-Holland. 447 p.

Khosla, P.K., ed. 1982. Improvement of forest biomass. Delhi, India: Pragati Press. 472 p.

Krugman, Stanley L. 1966. Artificial ripening of sugar pine seeds. Res. Pap. PSW-32. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 7 p.

Krugman, Stanley L.; Jenkinson, James L. 1974. *Pinus* L. pine. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 598-638.

Krugman, Stanley L.; Stein, William I.; Schmitt, Daniel M. 1974. Seed biology. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 5-40.

Lantz, Clark W. 1979. Artificial ripening techniques for loblolly pine cones. In: Karrfalt, R.P., comp. Seed collection workshop; 1979 May 16-18; Macon, GA. SA-TP-8. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southeastern Area State and Private Forestry: 53-58.

Lantz, Clark W., ed. 1985. Southern pine nursery handbook. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region. [Not paged, looseleaf].

Lantz, Clark W.; Kraus, John F. 1987. A guide to southern pine seed sources. Gen. Tech. Rep. SE-43. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 34 p.

Lauridsen, E.B.; Stubsgaard, Finn. 1987. Longevity of hardcoated seed after scarification. Tech. Note 32. Humlebaek, Denmark: DANIDA Forest Seed Centre. 4 p.

Leadem, C.L. 1984. Quick tests for tree seed viability. Land Mgmt. Rep. 18. Victoria, BC: British Columbia Ministry of Forests. 45 p.

Liegel, Leon H.; Venator, Charles R. 1987. A technical guide for forest nursery management in the Caribbean and Latin America. Gen. Tech. Rep. SO-67. New Orleans, LA: U.S. Department of Agriculture,

Forest Service, Southern Forest Experiment Station. 156 p.

Mayer, A.M.; Poljakoff-Mayber, A. 1975. The germination of seeds. 2d ed. London: Permagon Press. 192 p.

Michalski, Lesnek. 1969. Content of plant growth regulators in the developing seeds of oak *(Quercus robur* L.). Acta Societatis Botanicorum Poloniae. 38: 157-163.

Murray, David R., ed. 1984a. Seed physiology: development. New York: Academic Press. 279 p. Vol. 1.

Murray, David R., ed. 1984b. Seed physiology: germination and reserve mobilization. New York: Academic Press. 295 p. Vol. 2.

Napier, Ian; Robbins, Marcus. 1989. Forest seed and nursery practice in Nepal. Nepal-United Kingdom Forestry Research Project. Katmandu, Nepal: Sahayogi Press. 139 p.

Nautiyal, A.R.; Purohit, A.N. 1985. Seed viability in sal. 1: Physiological and biochemical aspects of seed development in *Shorea robusta.* Seed Science and Technology. 13: 59-68.

Neergard, Paul. 1977. Seed pathology. New York: John Wiley and Sons. 1,187 p. 2 vols.

Nienstadt, Hans; Snyder, E. Bayne. 1974. Principles of genetic improvement of seed. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 42-52.

Nikolaeva, M.G. 1967. Physiology of deep dormancy in seeds. Washington, DC: National Science Foundation. 220 p. [English translation.]

Olson, David F., Jr. 1974. *Quercus* L. oak. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 692-703.

Ontario Ministry of Natural Resources. 1983. Guidelines for tree seed crop forecasting. Toronto: Ontario Ministry of Natural Resources. 141 p.

Organization for Economic Cooperation and Development. 1974. OECD scheme for the control of forest reproductive material moving in international trade. Paris: Organization for Economic Cooperation and Development, Directorate for Agriculture and Food. 24 p.

Owens, J.N.; Blake, M.D. 1985. Forest tree seed production. Canadian Forestry Service Info. Rep. PI-X-53. Ottawa: Petawawa National Forestry Institute. 161 p.

Perry, D.A., ed. 1981. Handbook of vigour test methods. Zurich: International Seed Testing Association. 72 p.

Pfister, Robert D. 1967. Maturity indices for grand fir cones. Res. Note INT-58. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 7 p.

Rediske, J.H. 1961. Maturation of Douglas-fir seed - a biochemical study. Forest Science. 7: 204-213.

Rink, G.; Dell, T.R.; Switzer, G.; Bonner, F.T. 1979. Use of the Weibull function to quantify sweetgum germination data. Silvae Genetica. 28: 9-12.

Robbins, A.M.J.; Hughes, C.E. 1983. Provenance regions for *Pinus caribaea* and *Pinus oocarpa* within the Republic of Honduras. Tropical For. Pap. 18. Oxford, UK: Department of Forestry, Commonwealth Forestry Institute, University of Oxford. 80

Robbins, A.M.J.; Shrestha, K.B. [In press]. Tree seed quality in Nepal: problems and solutions. In: Proceedings of the IUFRO symposium on seed quality of tropical and sub-tropical species; 1984 May 22-26; Bangkok, Thailand. Bangkok: Kasetsart University.

Roberts, E.H. 1973. Predicting the storage life of seeds. Seed Science and Technology. 1: 499-514.

Rosenberg, Laurie A.; Rinne, Robert W. 1986. Moisture loss as a prerequisite for seedling growth in soybean seeds *(Glycine max* L. Merr.) Journal of Experimental Botany. 37: 1,663-1,674.

Ross, Stephen D.; Pharis, Richard P. 1976. Promotion of flowering in the Pinaceae by gibberellins. 1: Sexually mature, non-flowering grafts of Douglas-fir. Physiologum Plantarum. 36: 182-186.

Rudolf, Paul 0. 1974. Tree-seed marketing controls. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 153-166.

Rudolf, Paul O.; Dorman, Keith W.; Hitt, Robert G. land others]. 1974. Production of genetically improved seed. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 53-74.

Schimpf, D.J.; Flint, S.D.; Palmblad, I.G. 1977. Representation of germination curves with the logistic function. Annals of Botany. 41: 1,357-1,360.

Schopmeyer, C.S., tech. coord. 1974. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture. 883 p.

Sedgley, M.; Griffin, A.R. 1989. Sexual reproduction of tree crops. London: Academic Press. 378 p.

Simak, Milan. 1980. X-radiography in research and testing of forest tree seeds. Rapporter Nr. 3. Stockholm: The Swedish University of Agricultural Sciences, Department of Silviculture, Umea. 34 p.

Simak, M. 1984. A method for removal of filled-dead seeds from a sample of *Pinus contorta.* Seed Science and Technology. 12: 767-775.

Singh, R.V.; Singh, Virendra. 1983. Germination of *Populus ciliata* seed as influenced by moisture stress. The Indian Forester. 109: 357-358.

Southgate, B.J. 1983. Handbook on seed insects of *Acacia* species. Rome: Food and Agriculture Organization of the United Nations. 30 p.

Stanwood, Phillip C.; McDonald, Miller B., eds. 1989. Seed moisture. Spec. Publ. 14. Madison, WI: Crop Science Society of America. 115 p.

Stubsgaard, Finn. 1986. Pretreatment of *Acacia* and *Prosopis* seed: two mechanical methods. Tech. Note 27. Humlebaek, Denmark: DANIDA Forest Seed Centre. 8 p.

Sutherland, Jack R.; Miller, Thomas; Quinard, Rodolfo Salinas, eds. 1987. Cone and seed diseases of North American conifers. North American Forestry Commission Publ. 1. Victoria, BC: North American Forestry Commission. 77 p.

Tang, H.T.; Tamari, C. 1973. Seed description and storage tests of some dipterocarps. Malaysian Forester. 36(2): 38-53.

Tompsett, P.B. 1986. The effect of temperature and moisture content on the longevity of seed of *Ulmus carpinifolia* and *Terminalia brassii.* Annals of Botany. 57: 875-883.

Trivifio, D. Trino; De Acosta, Rosalba; Castillo, Amparo. 1990. Tecnicas de manejo de semillas para algunas especies forestales neotropicales en Colombia. Serie de Doc. 19. Bogota: Corporacion Nacional de Investigacion y Fomento Forestal, INDERENA, CIID. 91 p.

Trujillo, Enrique. 1986. Manual general sobre use de semillas forestales. Bogota, Colombia: Instituto Nacional de los Recursos Naturales Renovables y del Medio Ambiente. 55 p.

Turnbull, J.W.; Doran, J.C. [In press]. Role of the CSIRO Tree Seed Centre in collection, distribution, and improved use of genetic resources of Australian trees. In: Proceedings of the IUFRO symposium on seed quality of tropical and subtropical species; 1984 May 22-26; Bangkok, Thailand. Bangkok: Kasetsart University.

van der Burg, W.J.; Bekendam, J.; van Geffen, A. [and others]. 1983. Project seed laboratory 2000-5000. Seed Science and Technology. 11: 157-227.

von Carlowitz, Peter G. 1986. Multipurpose tree and shrub seed directory. Nairobi, Kenya: International Council for Research in Agroforestry. 265 p.

Vozzo, J.A. 1978. Radiographic terminology for biological research. Gen. Tech. Rep. SO-18. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 45 p.

Vozzo, J.A. 1988. Seed radiography. Materials Evaluation. 46: 1,450-1,455.

Whitehead, Donald R. 1983. Wind pollination: some ecological and evolutionary perspectives. In: Real, L., ed. Pollination biology. New York: Academic Press: 97-108.

Whitesell, C.D. 1974. *Leucaena leucocephala* (Lam.) deWit. leadtree. In: Schopmeyer, C.S., tech. coord. Seeds of woody plants in the United States. Agric. Handb. 450. Washington, DC: U.S. Department of Agriculture: 491-493.

Willan, R.L., comp. 1985. A guide to forest seed handling, with special reference to the Tropics. Forestry Paper 20/2. Rome: Food and Agriculture Organization of the United Nations. 379 p.

Willan, R.L. 1988. International transfer of forest seed. Tech. Note 35. Humlebaek, Denmark: DANIDA Forest Seed Centre. 20 p.

Winston, D.A.; Haddon, B.D. 1981. Effects of early cone collection and artificial ripening on white spruce and red pine germination. Canadian Journal of Forest Research. 11: 817-826.

Wright, Jonathan W. 1976. Introduction to forest genetics. New York: Academic Press. 463 p.

Zobel, Bruce; Talbert, John. 1984. Applied forest tree improvement. New York: John Wiley and Sons. 505 p.

Zobel, Bruce J.; van Wyk, Gerrit; Stahl, Per. 1987. Growing exotic forests. New York: John Wiley and Sons. 508 p.

Appendix

Final Evaluation Questionnaire

At the end of the training course, most sponsoring agencies and instructors would like an indication of the effectiveness of the course from the students. It should always be our goal to improve content and relevance of the course, as well as the method of presentation to the students. A questionnaire for this purpose is presented in the following pages. This particular questionnaire was prepared by the USDA Office of International Cooperation and Development for the numerous training courses that they sponsor. All of it may not be relevant to every presentation of this material; instructors should review the questionnaire and choose those parts that apply. The authors of this manual have used this questionnaire and recommend it to others for improvement of their future uses of this material.

Course name and number _____

SHORT COURSE EVALUATION FORM

PRECOURSE INFORMATION

1. Who discussed the general objectives of the course with you before you arrived at the course site? _____

_____

2. How clear were the course objectives? (Please circle answer.)

1	2	3	**4**	5
Very clear	Clear	Somewhat clear	Somewhat unclear	Unclear

3. In what ways did the course differ from what you expected? _____

_____

_____

4. Please describe how you were selected for participation in this course.

_____

_____

ORIENTATION

How helpful was your initial orientation at the course location?

Not helpful 1 2 3 **4** 5 Extremely helpful

_____ Did not attend

Comments on precourse information and orientation: _____

_____

_____

COURSE ADMINISTRATION/LOGISTICS

Please indicate your satisfaction with the following support arrangements at the course location:

	Not at all satisfied					Extremely satisfied
Housing accommodations	1	2	3	4	5	
Training facilities	1	2	3	4	5	
Transportation	1	2	3	4	5	
Administrative and logistic help	1	2	3	4	5	
Arranged social activities	1	2	3	4	5	

Please comment on the above arrangements: _____

_____

FIELD TRIP ADMINISTRATION/LOGISTICS

How adequate were the following field trip arrangements?

	Poor					Excellent
Preparatory information	1	2	3	4	5	
Transportation	1	2	3	4	5	
Lodging	1	2	3	4	5	
Helpfulness of instructors accompanying you	1	2	3	4	5	
Helpfulness of people you met in the field	1	2	3	4	5	
Overall coordination	1	2	3	4	5	

Please comment on the above arrangements.

COURSE CONTENT

At the beginning of the course or during the course, did you discuss with the instructors how the course content would meet your specific needs?

____Yes ____No

If yes, did you find the discussion helpful?

____Yes_____No

2. To what extent did you reach the following objectives through this course?

	Not achieved						**Fully** achieved
Objective 1		1	2	3	4	5	
Objective 2		1	2	3	4	5	
Objective 3		1	2	3	4	5	
Objective 4		1	2	3	4	5	
Objective 5		1	2	3	4	5	

3. Which objectives were most appropriate for your professional development? Please explain:

_____

_____

4. Was the level of presentation of the subject matter:

_____ Too simple? _____ About right? _____Too complex?

5. Which aspects of the subject matter covered in the course will you use most when you return to your job? Please explain: _____

_____

6. Which aspects of the subject matter will you use least when returning to your job? Please explain: _____

_____

7. Based on your own needs, what course topics would you recommend be expanded? _____

Shortened? _____

Omitted? _____

Added? _____

8. What aspects of the course were most relevant to your country's conditions and to your role in your country's development? Please explain: _____

9. Did the field trip provide you with practical applications of the course content? Please explain:

COURSE DESIGN AND DELIVERY

1.	During the course, was the daily schedule:	Too ____short?	About ____right?	Too _____long?
2.	Was the overall length of the course:	Too ____short?	About ____right?	Too ____long?

3. Which of the following training methods were used to help you learn in this course? (Please circle those that were used.)

a. Lecturettes

b. Large group discussions

c. Small group discussions

d. Case studies

e. Practical hands-on experience in the field

f. Classroom/laboratory exercises and experiments

g. Role plays/simulation

h. Individual consultations with instructors

i. Other

4. Which of these methods most helped your learning and ability to use the skills? (List in the order of priority for helping you learn.)

a. _____

b. _____

c. _____

d. _____

e. _____

5. Were any of these methods used too much? Yes ____No

If yes, please explain: _____

_____

_____

6. Were any of these methods used too little? ____Yes ____No

If yes, please explain: _____

_____

_____

7. Could the course have been presented more effectively to meet your needs? ____Yes ____No

If yes, please explain: _____

_____

_____

8. How useful were the following types of materials used in the course? (Please circle the appropriate number.)

	Not at all useful					Extremely useful
Written materials (manuals, handouts, texts)	1	2	3	4	5	
Audiovisual materials	1	2	3	4	5	
Computer-assisted instruction (if used)	1	2	3	4	5	

9. Please give examples of the most effective materials.

_____

_____

10. Please give examples of the least effective materials.

_____

_____

INSTRUCTORS

Name of first instructor: _____

Please rate this instructor in the following areas:

	Poor 1	2	3	4	5	Excellent
Knowledge of subject matter	1	2	3	4	5	
Training ability	1	2	3	4	5	
Ability to relate material to your country	1	2	3	4	5	
Overall effectiveness	1	2	3	4	5	

Comments: _____

_____

_____

Name of second instructor: _____

Please rate this instructor in the following areas:

	Poor					Excellent
Knowledge of subject matter	1	2	3	4	5	
Training ability	1	2	3	4	5	
Ability to relate material to your country	1	2	3	4	5	
Overall effectiveness	1	2	3	4	5	

Comments: _____

_____

_____

Name of third instructor: _____

Please rate this instructor in the following areas:

	Poor					Excellent
Knowledge of subject matter	1	2	3	4	5	
Training ability	1	2	3	4	5	
Ability to relate material to your country	1	2	3	4	5	
Overall effectiveness	1	2	3	4	5	

Comments: _____

_____

_____

Name of fourth instructor: _____

Please rate this instructor in the following areas:

	Poor					Excellent
	1	2	3	4	5	
Knowledge of subject matter	1	2	3	4	5	
Training ability	1	2	3	4	5	
Ability to relate material to your country	1	2	3	4	5	
Overall effectiveness	1	2	3	4	5	

Comments: _____

_____

_____

OVERALL COURSE SATISFACTION

1. Would you recommend this course to other individuals with a background similar to yours? ___Yes ___No

   Please explain why: _____

2. Please rate your overall satisfaction with the participation of your classmates.

   Not at all satisfied 1 2 3 4 5 Extremely satisfied

Comments: _____

_____

_____

3. Please rate your overall satisfaction with this course:

   Not at all satisfied 1 2 3 4 5 Extremely Satisfied

4. What final comments or suggestions do you have on this course?

_____

_____

_____

PARTICIPANT DATA

Home country: ___Gender: ____Male ____Female

Main field of education: _____

Highest degree achieved: _____Secondary _____(BA/BS) _____(MA/MS) _____ (Ph.D.)

Other: _____

Year in which highest degree was obtained: _____

Type of position currently occupied:

_____Scientific _____ Administrative _____Technical _____ Other

If you have managerial or administrative responsibilities, please describe them: _____

_____

_____

How long have you been working in your current position? _____

Did you find language to be a problem in the course? _____Yes _____No.

If yes, please describe: _____

_____

_____