

Stephen W. Hallgren

Associate Professor of Forest Ecology
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Department of Natural Resource Ecology and Management
Oklahoma State University
Stillwater, Oklahoma 74078-6013

EDUCATION

Ph.D. Forest Biology, 1984, University of California, Berkeley

M.S. Forest Ecology, 1978, Oregon State University, Corvallis

B.S. Forest Science, 1972, University of Minnesota, St. Paul

EXPERIENCE

1990-Present Assoc. Prof. Forest Ecology, Oklahoma State University,

2001-2002 Sabbatical, INRA, Avignon, France

1993-1994 Fulbright Senior Research Scholar, Universität Bayreuth, Germany

1986-1990 Assist. Prof. Forest Ecology, Oklahoma State University

1985-1986 Postdoctoral Fellow, INRA, Orléans, France

RESEARCH SUPPORT

2008-2012 Fire Frequency Effects on Habitat Quality of Three Wildlife Management Areas Dominated by Cross Timbers Forests. Hallgren and Leslie. Oklahoma Cooperative Fish and Wildlife Service Research Unit. \$306,666.

2008-2009 Magnitude and geographic distribution of the threat of redcedar encroachment in Oklahoma Cross Timbers forests. Hallgren, Bidwell, Boyer, Hoagland, Lynch, Palmer, Stahle. OAES and OCES Team Initiative Program. \$51,767.

2003-2008 Regeneration of Oklahoma forests, Oklahoma Agricultural Experiment Station, \$7,000/year.

2002-2005 Impact of brush removal for fire breaks on the ecophysiology and growth of trees and shrubs in a mixed pine-oak forest and the consequences for slowing the initial propagation of wild fire. Huc et al. French Government. 90,000 €

- 2002-2004 Modélisation du Fonctionnement et de la croissance des arbres en peuplement mixte.” Roland Huc et al. Réseau d’Ecophysiologie de l’Arbre. 12,000 €
- 2001-2003 Restoration and management research for ancient cross timbers forest. Stacy Clark and Stephen Hallgren. US Army Corps of Engineers. \$20,000.
- 2001-2003 Comparison of limitations to water transport in oak and pine. Stephen Hallgren. INRA French National Institute for Agronomic Research. 84,000 FF (\$14,000).
- 1998-1999 Exploring natural and cultural resources: An international experiential approach. Tom Kuzmic, Steve Hallgren, Ed Miller. USDA/Higher Education Challenge Grants Program. \$40,165.
- 1996-2000 Root hydraulic properties and anatomy of pines: Developmental changes. S.W. Hallgren in collaboration with C.A. Peterson at the University of Waterloo. NRIGCP. \$104,000.
- 1994-1995 Hydraulic properties of roots in relation to water-use efficiency, S. W. Hallgren, B. Martin and C.G. Tauer, OAES-TRIP, \$21,750.
- 1992-1995 Enhanced systems to improve tree seedling production, K. E. Conway and S. W. Hallgren, OCAST, \$148,000.
- 1987-1991 Genetic and environmental control of rooting density and fine root turnover in loblolly pine, S.W. Hallgren and C.G. Tauer, Weyerhaeuser Company, \$50,000.
- 1989-1991 Lifting window for shortleaf pine planted in the Ouachita Mountains, S.W. Hallgren, U.S. Forest Service, \$25,000.

PUBLICATIONS

- Clark, S.L., Hallgren, S.W., Engle, D.M., and Stahle, D. 2007. The historic fire regime on the edge of the prairie: a case study from the Cross Timber of Oklahoma. In: Proceeding Tall Timbers 23rd Fire Ecology Conference. pp 40-49. Tall Timbers Research Station, Tallahassee, FL.
- Kumar, P., Hallgren, S.W., Enstone, D.E. and Peterson, C.A. 2007. Root anatomy of *Pinus taeda* L.: seasonal and environmental effects on development in seedlings. *Trees* 21:693-706.
- Clark, S., Hallgren, S. W., Lynch, T. B. and Stahle, D. W., 2005. Characteristics of the Keystone Ancient Forest Preserve, an old-growth forest in the Cross Timbers of Oklahoma. *Natural Areas J.* 25:165-175.

- Hallgren, S. W. 2005. Tree physiology: shoot growth and canopy development. *In* Encyclopedia of Forest Sciences. Eds. J. Burley, J. Evans, and J. A. Youngquist. Academic Press, London. Pp. 1600-1606.
- Clark, S.L. and S.W. Hallgren, 2004. Dynamics of oak (*Quercus marilandica* and *Q. stellata*) reproduction in an old-growth Cross Timbers forest. *Southeastern Naturalist* 2:559-574.
- Clark, S. and Hallgren, S.W. 2004. Can oak seedlings be aged from bud scars. *Southwest. Nat.* 49:243-246.
- Clark, S. and Hallgren, S.W. 2004. Age estimation of *Quercus marilandica* and *Q. stellata*: applications for interpreting stand dynamics. *Can. J. For. Res.* 34:1353-1358.
- Clark, S. and Hallgren, S.W. 2003. Dynamics of oak (*Quercus marilandica* and *Q. stellata*) reproduction in an old-growth cross timbers forest. *Southeastern Naturalist*. *Southeast. Nat.* 2:559-574.
- Wu, L., Hallgren, S. W., Huang, Y., Conway, K. E. And Tauer, C. G. 2003. Storage protein mobilization and thiol protease up-regulation by solid matrix priming in loblolly pine (*Pinus taeda*) seed embryos. *Seed Sci. Technol.* 31:667-680.
- Enstone, DE, Peterson, CA and Hallgren, SW. 2001. Anatomy of seedling roots of loblolly pine (*Pinus taeda* L.). *Trees – Structure and Function* 15:98-111.
- Conway, K.E., Mereddy, R., Kahn, B.A., Wu, Y., Hallgren, S.W. and Wu, L. 2001. Beneficial effects of solid matrix chemo-priming in Okra. *Plant Disease*. 85:535-537.
- Wu, L., S.W. Hallgren, D.M. Ferris, and K.E. Conway. 2001. Effects of moist chilling and solid matrix priming on germination of loblolly pine (*Pinus taeda* L.) seeds. *New Forests*. 21:1-16.
- Mereddy, R., Wu, L., Hallgren, S.W., Wu, Y. and Conway, K.E. 2000. Solid matrix priming improves vigor of okra seedlings. *Proc. Okla. Acad. Sci.* 80:33-37.
- Wu, L., S.W. Hallgren, D.M. Ferris, and K.E. Conway. 1999. Solid matrix priming to enhance germination of loblolly pine (*Pinus taeda*) seeds. *Seed Sci. and Technol.* 27:251-261.
- South, D.B. and S.W. Hallgren. 1997. Research versus operational correlations between seedling survival and root growth potential of shortleaf pine. *New Forests*. 13:357-365.
- Hallgren, S.W. and L. Wu. 1995. Water relations of seed germination in pine. pp. 237-242. *In*: Proceedings 1995 Society of American Foresters Convention, Portland Maine, Oct. 28 – Nov. 1, Society of American Foresters, Baltimore, Maryland.
- Hallgren, S.W., M. Rüdinger and E. Steudle. 1995. Root hydraulic properties of spruce measured with the pressure probe. *Plant Soil*. 167:91-98.

- Hallgren, S.W. and D.M. Ferris. 1995. Benomyl applied to roots improves second-year survival and growth of shortleaf pine. *South. J. Appl. For.* 19:36-41.
- Rüdinger, M., S.W. Hallgren, E. Steudle, and E.-D. Schultze. 1994. Hydraulic and osmotic properties of spruce roots. *J. Exp. Bot.* 279:1413-1425.
- Hallgren, S.W., C.G. Tauer and D.L. Weeks. 1993. Cultural, environmental and genetic factors interact to affect performance of planted shortleaf pine. *For. Sci.* 39: 478-498.
- Hallgren, S.W.. 1992. The impact of lift and store practices on field performance of shortleaf pine seedlings. In *Proceedings of the Shortleaf Pine Regeneration Workshop*. (Little Rock, AR, Oct. 29-31, 1991). pp. 46-57. USDA For. Ser. SFES Gen. Tech. Report SO-90.
- Hallgren, S.W. and J.A. Helms. 1992. The effects of summer shoot production on height growth components of seedlings of California red and white fir. *Can. J. For. Res.* 22:690-698.
- Tauer, C.G., S.W. Hallgren and B. Martin. 1992. Using marker-aided selection to improve tree growth response to abiotic stress. *Can. J. For. Res.* 22:1018-1030.
- Hallgren, S.W., C.G. Tauer and J.E. Lock. 1991. Fine root carbohydrate dynamics of loblolly pine seedlings grown under contrasting levels of soil moisture. *For. Sci.* 37:766-780.
- Hallgren, S.W. 1989. Growth response of *Populus* hybrids to flooding. *Ann. Sci. Forest.* 46:361-372.
- Hallgren, S.W. and C.G. Tauer. 1989. Root growth potential, first-year survival and growth of shortleaf pine seedlings show effects of lift date, storage and family. *South. J. Appl. For.* 13:163-169.
- Hallgren, S.W. 1989. Effects of osmotic priming using aerated solutions of polyethylene glycol on germination of pine seeds. *Ann. Sci. Forest.* 46:31-37.
- Hallgren, S.W. and J.A. Helms. 1988. Control of height growth components in seedlings of California red and white fir by seed source and water stress. *Can. J. For. Res.* 18:521-529.
- Carlson, W.C., C.A. Harrington, P. Farnum, S.W. Hallgren. 1988. Effects of root severing on loblolly pine. *Can. J. For. Res.* 18: 1376-1385.

PROFESSIONAL MEETINGS

- 2005 Clark, S.L., Hallgren, S.W., Engle, D.M. and Stahle, D. The historic fire regime on the edge of the prairie: a case study from the Cross Timbers of Oklahoma, Paper presented at the 23rd Tall Timbers Fire Ecology

- Conference: Fire in Grassland & Shrubland Ecosystems, Bartlesville, Oklahoma, U.S.A., 17-19 October
- 2004 Clark, S. and Hallgren, S. W. Characterization of an old-growth forest in the cross timbers of Oklahoma. Paper presented at the symposium, Ancient Cross Timber Consortium, Inaugural Meeting, Tulsa OK, April 30 and May 1.
- 2002 Clark, S. and Hallgren, S. W. Characterization of an old-growth forest in the cross timbers of Oklahoma. Poster presented at the symposium, Upland Oak Ecology, The History, Current Conditions and Sustainability, Fayetteville AR, October 7 to 10.
- 2002 Clark, S. and Hallgren, S. W. Tree-ring analysis of fire frequency in an old-growth forest in the cross timbers of Oklahoma. Paper presented at the 50th annual meeting of the Southwestern Association of Naturalists, Norman OK, April 17 to 19.
- 2001 Hallgren, S.W., Huc, R., Doussan, C., and Vercambre, G. Hydraulic properties of mixed stands of *Pinus halepensis* and *Quercus ilex*. Paper presented at the meeting: Flux d'Eau dans les Organes en Croissance & Architecture Hydraulic. May 29-31. Nancy, France.
- 2001 Hallgren, S.W., Thondikkattil, P., Chatelet, D., Ferris, D.M., Enstone, D.E., and Peterson, C.A. Root hydraulic properties and anatomy in pine: developmental changes. Poster presented at the Premières Rencontres d'Ecophysologie de l'Arbre: Ecole Thématique. Jan. 16-19. Autrans, France.
- 1999 Governor's Conference on Forestry in Oklahoma, Oklahoma City OK, Dec 6-7.
- 1999 Enstone, D.E., Peterson, C.A. and Hallgren, S.W. Developmental anatomy of loblolly pine (*Pinus taeda* L.) roots: Its implications for water uptake. Paper presented at the 2nd International Symposium on the Dynamics of Physiological Processes in Roots. Sept. 24-30, Nancy, France.
- 1999 Opportunities for Cooperative Research in France, INRA, Mediterranean Forestry Research Center, Avignon and U.A. Bioclimatologie-PIAF, Clermont-Ferrand, visited researchers to discuss cooperative research, presented two seminars, February 5-14.
- 1998 Opportunities for Student and Faculty Exchange with Scandinavia, University of Helsinki, Finland, Swedish University of Agricultural Sciences, Umeå, visit faculty and facilities, presented two seminars, August 12-22.
- 1998 Oklahoma Department of Agriculture, Forestry Services; Forest Regeneration and Tree Improvement Program Review for Oklahoma, Washington OK, March 30-31.

- 1997 Hallgren, S.W. Water uptake and transport by tree roots. Invited presentation made to Department of Biology, University of Waterloo, Ontario in November.
- 1997 Wu, L., Y. Huang, S.W.Hallgren, and D.M. Ferris. Enhanced gene translation and activity of thiol protease during solid matrix priming and germination of loblolly pine seeds. paper presented by Y. Huang at the Joint Meeting of the IUFRO Working Parties 2.04-07 and 2.04-06 Somatic Cell Genetics and Molecular Genetics of Trees. Quebec City, Canada, August 12-16.
- 1996 International Society for Root Research; Clemson, SC; presented paper – Effects of drought on carbon metabolism of pine roots.
- 1995 Society of American Foresters National Convention; Portland, Maine; presented paper – Water relations of seed germination in pine at the Physiology Working Group technical session.
- 1994 13th North American Forest Biology Workshop; Baton Rouge, LA; presented paper - Root hydraulic properties of spruce.
- 1993 EUROSILVA Conference; Tharandt, Germany; presented one poster - Root hydraulic properties of Norway spruce.
- 1993 4th International Symposium on Structure and Function of Roots; Stará Lesná, Slovakia; presented one paper - Root hydraulic properties of spruce measured with the pressure probe.
- 1992 Oklahoma Academy of Science Annual Meeting; Lawton, Ok; presented one paper - Effects of desiccation of root growth potential and field performance of pine seedlings.
- 1991 Shortleaf Pine Regeneration Workshops, Little Rock, AR; presented two papers - The impact of lift and store practices on field performance of shortleaf pine seedlings, and Lifting window for shortleaf pine planted in the Ouachita Mountains.
- 1990 11th North American Forest Biology Workshop; Athens, Georgia; presented two papers - Root growth and carbohydrate dynamics of North Carolina and Oklahoma-Arkansas loblolly pine seedlings under contrasting levels of soil moisture, and Osmotic priming of southern pine seeds
- 1990 6th Biennial Southern Silviculture Conference; Memphis, Tennessee; read one paper - Effects of lift date, storage and family on shortleaf pine seedling quality and performance
- 1989 15th Southern Forest Tree Physiology Workshop; Bossier City, Louisiana
- 1988 IUFRO International Symposium on Tree Physiology; Nancy, France; presented poster - Effects of altering the root/shoot balance on water relations of loblolly pine seedlings

1988 10th North American Forest Biology Workshop; Vancouver, B.C.; read two papers - Growth response of *Populus* hybrids to flooding, and Effects of lift date, storage and family on root growth potential, first-year survival and growth of shortleaf pine seedlings

COURSES TAUGHT

Forest Ecology

Silvics and Field Silviculture (summer camp)

Graduate Seminar

Expand Your Horizons: What Study Abroad is Really About

Wildland Fire Ecology and Management

Ecology of Rangeland Habitats and Landscapes Including Forestry, University of Chihuahua, Department of Zootecnia, summer of 2005

GRADUATE STUDENTS

Laxman Karki. MS. Thesis title: Tree Fall Gap Dynamics in the Cross Timbers of Oklahoma. 2007.

David Chatelet. PhD. Thesis title: Hydraulic Properties of Roots of Loblolly Pine Seedlings (*Pinus taeda* L.). 2004.

Stacy Clark. PhD. Thesis title: Stand Dynamics of an Old-Growth Forest in the Cross Timbers of Oklahoma. 2003.

Prem Kumar. PhD. Thesis title: Anatomical Characteristics of Roots of Loblolly Pine Seedlings. 2003.

Prem Kumar. MS. Thesis title: Effect of Acorn Size on the Seedling Growth of Shumard Oak, *Quercus shumardii* Buckl. 1999.

Geroges Backoulou. MS. Thesis title: Oak regeneration of the Cross-Timbera of Oklahoma. 1998.

Luguang Wu. PhD. Thesis title: Development of Solid Matrix Priming to Enhance Loblolly Pine (*Pinus taeda*) Seed Germination and Anaylsis of it Physiological Mechanisms. 1997.

Ferit Kocacinar. MS. Thesis title: Effects of Moisture Stress Conditioning and the Presence of New Roots on the Water Relations Parameters derived from Pressure Volume Curves. 1997.

Gezahegne Bushra. MS. Thesis title: Use of Two Benzimidazole Fungicides to improve roots growth potential and field performance on shortleaf pine (*Pinus echinata* Mill.) seedlings. 1993.

Zhijun Liu. MS. Thesis title: Effects of Altering the Root System and Shoot Size on the Water Relations of Loblolly Pine (*Pinus taeda* L.) Seedlings Under Contrasting Levels of Soil Moisture Stress. 1988.

UNIVERSITY RESPONSIBILITIES

Graduate Coordinator Department of Natural Resource Ecology and Management

Fulbright Program Advisor, OSU

Member, Plant Sciences Graduate Program Steering Committee

Member, Environmental Science Steering Committee

Member, Group I of the Graduate Faculty

PROFESSIONAL ACTIVITIES

Editor-in-Chief, *New Forests*, 1994-present

Scientific Board, *Annales des Science Forestières*, 1990-present

Society of American Foresters, Member

IUFRO Shoot Growth Physiology Working Party S2.01.11, Member

Society of American Foresters Physiology Working Group C6, Member

President, North-Central Oklahoma Chapter of the Fulbright Association