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EDUCATION

Ph.D. Crop Physiology, University of Arkansas--1990
M.S. Tree Physiology, Colorado State University--1982
B.S. Forest Management, Colorado State University--1979

STATEMENT OF RESEARCH INTEREST

Current research interests include quantifying plant response to environmental change, modeling plant, regional, and global carbon and water cycles, and incorporating emerging capabilities of plant genomics into studies of plant physiology and ecology. Field experiments are conducted to examine the response of plants to atmospheric CO₂ enrichment, drought, and warming, focusing on carbon, water, and energy exchange. Mechanistic understanding gained in these investigations is incorporated into models and used to assess leaf, plant, stand, and ecosystem-scale responses to global climatic change. Studies are being expanded to examine role of plants and microbes in biosequestration, what new approaches can be used to model hierarchical systems in ecology; and how sensors and sensor networks can best be developed and deployed for high-resolution measurements in the ecological sciences.

PROFESSIONAL EXPERIENCE

Laboratory Directed Research and Development (LDRD Manager, Systems Biology and the Environment (2009-present); Biological and Environmental Sciences Directorate, Oak Ridge National Laboratory, Oak Ridge, TN. Participate in setting the ORNL research agenda in support of high-risk, potentially high-value research and development in the biological and environmental sciences.

Lead Scientist, Climate Change Mitigation Science Focus Area (2008-present); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Coordinate a three national laboratory effort to understand the chemical, physical, and biological mechanisms that regulate the soil carbon cycle and to use that understanding to enhance carbon sequestration in terrestrial ecosystems.

Interim Division Director (2008-2009); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Oversaw the scientific operations of a large, multi-disciplinary organization that encompassed more than 165 scientists, technicians, students, and guests.

Leader, Plant Systems Biology Group (2005-present); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Provide scientific leadership to a highly talented and multi-disciplinary group of researchers involved in applying new tools of molecular biology to questions of interest to plant biology, bioenergy crop development, carbon sequestration, and ecosystem genomics.

Distinguished R&D Scientist (2005-present); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Conduct field and laboratory studies on the physiological and ecological response of terrestrial ecosystems to global environmental change. Participate in genetic and genomic

investigations highlighting the role of tissue quantity and chemistry in carbon sequestration.

Chief Scientist, Detection and Simulation of Ecosystem Response (2005-2007); Oak Ridge National Laboratory, Oak Ridge, TN. Led a lab-wide initiative to apply new technology in ecology. Areas of interest include sensors and sensor networks, next-generation facilities, and simulation of terrestrial ecosystems.

Senior R&D Staff Scientist (2002-2005); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Conducted field and laboratory studies on the physiological and ecological response of terrestrial ecosystems to global environmental change. Participated in the functional and comparative genomic investigations of plant carbon allocation and biomass distribution in trees. Assisted in the coordination of the DOE effort to sequence the poplar genome and co-lead International *Populus* Genome Consortium.

Staff Research Member (1995-2002); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Identified and modeled mechanisms by which plants respond to global environmental change. Research emphasized carbon and water cycles, carbon sequestration, advanced instrumentation for the ecological sciences, bioenergy crops, and ecosystem genomics.

Staff Research Associate (1992-1995); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Examined response of plants and ecosystems to changing global climate and explored accelerated domestication of woody and herbaceous crops for an emerging biofuels industry.

Alexander Hollaender Distinguished Postdoctoral Fellow (1990-1992); Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN. Established physiological and biochemical mechanisms of plant response to environmental stresses.

Research Assistant (1985-1990); Department of Agronomy, University of Arkansas, Fayetteville, AR. Documented the effects of environmental and nutritional stresses on foliar gas-exchange, carbon allocation, and plant productivity in a wide range of agricultural crops, including cotton, soybean, and rice.

Plant Physiologist (1981-1985); USDA-ARS, Fort Collins, CO. Investigated soil and environmental influences on root hydraulic conductivity and whole-plant nutrient uptake. Served as irrigation specialist and participated in the development of advanced sensors and sensor networks for crop water scheduling.

Graduate Research Assistant (1979-1981); Department of Forest and Wood Sciences, Colorado State University, Fort Collins, CO. Investigated hormone biosynthesis by ectomycorrhizal fungi and the influence of ectomycorrhizal fungi in determining pine seedling vigor.

PROFESSIONAL AWARDS AND HONORS

- UT-Battelle Awards Night Director's Award for Outstanding Team Accomplishment (2007)
- UT-Battelle Awards Night Winner, Scientific Research Team (2007)
- Scientific Achievement Award (1998), Environmental Sciences Division, Oak Ridge, TN
- Alexander Hollaender Distinguished Postdoctoral Fellowship (1990), ORAU, Oak Ridge, TN
- Outstanding Graduate Student Award (1990), American Society of Agronomy
- Gerald O. Mott Scholarship (1989), Crop Science Society of America
- BASF Outstanding Presentation Award (1989), Beltwide Cotton Production Research Conferences

- Aubrey E. Harvey Award (1988), Sigma Xi Research Society, University of Arkansas
- Outstanding Agronomy Ph.D. Student (1987), Department of Agronomy, University of Arkansas
- Hill Memorial Fellowship (1981), Department of Forest Science, Colorado State University
- Colorado Graduate Scholarship (1980), Graduate School, Colorado State University.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Ecological Society of America; American Geophysical Union; Soil Science Society of America

SERVICE TO OAK RIDGE NATIONAL LABORATORY

- Alvin M. Weinberg Post-doctoral Fellowship Committee (2008-present)
- LDRD Selection and Review Panel – Understanding Climate Change Impacts (2009)
- LDRD Selection and Review Panel – Systems Biology and the Environment (2007-2009)
- Seed Fund Committee (2005-2007)
- UT Battelle Awards Night Selection Committee (2008-2009) – Distinguished Scientist, Early Career Award for Scientific Accomplishment, and Scientific Research
- UT Battelle Awards Night Selection Committee (2008-2009) – Administrative Support (Team or Exempt Individual), Administrative Support, Nonexempt, and Esprit de Corps
- ESD Awards Committee (2002-2005) – Technical, Operational, and Administrative Support
- Workshop Organization – Moving Towards an Ecological Genomics Initiative: Putting Genomics to Work in Ecology and the Environmental Sciences (2005), Oak Ridge Center for Advanced Studies.

SERVICE TO THE SCIENTIFIC COMMUNITY

- Editor – Tree Physiology (2000-2007)
- Editorial Review Board – Tree Physiology (1992-present)
- Ecological Society of America Student Awards Committee (Buell and Braun Awards; 2007-2008)
- Workshop Organization
 - Sensors and Sensor Networks (2005), Ecological Society of America
 - Biospheric Monitoring Ecosystem Forecasts: Sensing the Pulse of the Planet (2006), American Association for the Advancement of Science (AAAS)
 - Linking physiological ecology, evolutionary biology, and functional genomics for better understanding biotic responses to a changing climate (2007), Ecological Society of America
 - Mechanistic Underpinning of Ecological Processes: Scaling from genes to ecosystems (2007), Ecological Society of America
 - Molecular Interactions of Carbon with Mineral Soils (2010), Goldschmidt Conference
- Technical Review Board, Savanna River Short-rotation Woody Crops Coop (1999-2005)
- Research Council, Southern Man and the Biosphere (1999-2005)
- Reviewer for scientific journals, including Science, Nature, New Phytologist, Global Change Biology, Plant Cell and Environment, Plant Physiology, Plant Cell, GCB Bioenergy, Ecology, Ecology Letters, American Journal of Botany, Journal of Experimental Botany, Tree Physiology, Forest Ecology and Management, Physiologia Plantarum, Journal of Environmental Quality, Agricultural and Forest Meteorology, Journal of Geophysical Research, and Functional Ecology.

ADDITIONAL TRAINING

Developing Leadership Potential (2006)

PUBLICATIONS – February 17, 2010; h-index 35; Total citations 4,541

BOOKS EDITED - 1 total

1. Hanson, P.J. and S.D. Wullschleger (eds.) North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes. 2003. Springer, New York, NY. Pp. 472.

BOOK CHAPTERS - 18 total

1. Oosterhuis, D. M. and S. D. Wullschleger. 1989. Psychrometric water potential analysis in leaf discs. pp. 113-133. *In* Modern Methods of Plant Analysis, New Series, Volume 9, Gases in Plant and Microbial Cells. H. F. Linskens and J. F. Jackson (eds.). Springer-Verlag, Berlin.
2. Wullschleger, S.D., W.M. Post and A.W. King. 1995. On the potential for a CO₂ fertilization effect in forest trees - An assessment of 58 controlled-exposure studies and estimates of the biotic growth factor. Pp.85-107. *In* Biotic Feedbacks in the Global Climate System: Will Warming Feed the Warming? G.M. Woodwell and F.T. Mackenzie (eds.). Oxford Press.
3. Norby, R.J., E.G. O'Neill and S.D. Wullschleger. 1995. Belowground responses to atmospheric carbon dioxide in forests. Pp. 397-418. *In* Carbon Forms and Functions in Forest Soils. W.F. McFee and J.M. Kelly (eds.). American Society of Agronomy, Madison, WI.
4. Norby, R.J., S.D. Wullschleger and C.A. Gunderson. 1996. Tree Responses to Elevated CO₂ and Implications for Forests. Pp. 1-21. *In* Carbon Dioxide and Terrestrial Ecosystems. G.W. Koch and H.A. Mooney (eds.). Academic Press.
5. McLaughlin, S.B., J.D. Joslin, A. Stone, R. Wimmer and S.D. Wullschleger. 1996. Effects of acid deposition on calcium nutrition and health of Southern Appalachian Spruce-Fir forests. *In* Proc. IUFRO Symp. Air Pollution and Multiple Stresses. R. Cox, K.Percy, K. Jensen and C. Simpson (eds.). p. 207-215. Fredericton, New Brunswick, Canada. September 7-9, 1994.
6. Post, W.M., A.W. King and S.D. Wullschleger. 1996. Soil organic matter models and global estimates of soil organic carbon. D.S. Powlson, P. Smith, and J.U. Smith (eds.), NATO Advanced Science Institute, Series I, vol. 38:201-222.
7. Wullschleger, S.D., R.J. Norby and C.A. Gunderson. 1997. Forest trees and their response to atmospheric CO₂ Enrichment - A Compilation of Results. Pg. 79-100. *In* Advances in Carbon Dioxide Effects Research. L.H. Allen, Jr. (ed.). American Society of Agronomy Special Publication
8. McLaughlin, J.D. Joslin, W. Robarge, A. Stone, R. Wimmer and S.D. Wullschleger. 1997. The impact of acidic deposition and global change on high elevation Southern Appalachian Spruce-Fir forests. Pg. 255-277. *In* The Productivity and Sustainability of Southern Forest Ecosystems in a Changing Environment. R.A. Mickler and S. Fox (eds.). Forest Service, Southern Global Change Program.
9. Martin, M., S. Wullschleger, and C. Garten. 2002. Laser-induced breakdown spectroscopy for environmental monitoring of soil carbon and nitrogen. *In* T. VoDinh and S. Buttgenbach (eds.) Advanced Environmental Sensing Technology. Pg. 188-195. Proceedings of the Society of Photo-optical Instrument Engineers.

10. Wullschleger, S.D. and P.J. Hanson. 2003. Sensitivity of saplings and mature-tree water use to altered precipitation regimes. pg. 87-99. *In North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes*. P.J. Hanson and S.D. Wullschleger (eds.). Springer, New York.
11. Wullschleger S.D., P.J. Hanson and D.E. Todd. 2003. Forest water use and the influence of precipitation change. pg. 363-377. *In North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes*. P.J. Hanson and S.D. Wullschleger (eds.). Springer, New York, NY.
12. Wullschleger S.D., C.A. Gunderson, L.M. Tharp, D.C. West and W.M. Post. 2003. Simulated patterns of forest succession and productivity as a consequence of altered precipitation. pg. 433-446. *In North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes*. P.J. Hanson and S.D. Wullschleger (eds.). Springer, New York.
13. Hanson, P.J., N.T. Edwards, T.J. Tschaplinski, S.D. Wullschleger and J.D. Joslin. 2003. Estimating the net primary and net ecosystem production of a southeastern upland *Quercus* forest from an 8-year biometric record. pg. 378-395. *In North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes*. P.J. Hanson and S.D. Wullschleger (eds.). Springer, New York.
14. Norby R.J., L.A. Joyce and S.D. Wullschleger. 2004. Modern and future forests in a changing atmosphere. Pg. 394-414. *In History of Atmospheric CO₂ and the Impacts on Plants, Animals, and Ecosystems*. J. Ehleringer, T. Cerling and D. Dearing (eds.). Springer, New York.
15. Tuskan, G.A., S.D. Wullschleger, J.H. Cushman, R.L. Graham, and S.R. Thomas. 2004. Mitigation of greenhouse warming, biomass-based energy supply systems and accelerated domestication of energy crops. *In* N.J. Rosenberg, F.B. Metting, and R.C. Izuaralde (eds.) *Application of Biotechnology to Mitigation of Greenhouse Warming*, St. Michaels, MD, April 13-15, 2003.
16. Norby R.J., S.D. Wullschleger, P.J. Hanson, C.A. Gunderson, T.J. Tschaplinski, J.D. Jastrow. 2006. CO₂ enrichment of a deciduous forest: The Oak Ridge FACE Experiment. pp. 231-251 *In Managed Ecosystems and CO₂: Case Studies, Processes, and Perspectives* (Nösberger J., Long S.P., Norby R.J., Stitt M., Hendrey G.R., Blum H, editors). Ecological Studies, Vol. 187. Springer, Berlin.
17. Martin, M.Z., S.D. Wullschleger, C.T. Garten, and P.V. Palumbo. 2007. Measurement of carbon for carbon sequestration and site monitoring. *In* J.P. Singh and S.N. Thakur (eds.) *Laser Induced Breakdown Spectroscopy*, Elsevier Science, The Netherlands.
18. Wullschleger S.D. and D.J. Weston. 2010. Microarrays and Molecular Phenotypes. *In* J.A. DeWoody (ed.) *Molecular Insights into Natural Resource Conservation and Management*, Cambridge University Press.

REFEREED PUBLICATIONS

1. Kidd, F. A., S. D. Wullschleger, K. Dawley and C. P. P. Reid. 1982. Use of Gentamicin in axenic culturing of ectomycorrhizal plants. *Applied Environmental Microbiology* 44:506-508.
2. Schaffer, B., F. G. Hawksworth, S. D. Wullschleger and C. P. P. Reid. 1983. Cytokinin-like activity related to host reactions to Dwarf mistletoe (*Arceuthobium* spp.). *Forest Science* 29:66-70.
3. Fiscus, E. L., S. D. Wullschleger and H. R. Duke. 1984. Integrated stomatal opening as an indicator of

water stress in *Zea*. Crop Science 24:245-249.

4. Wullschleger, S. D. and D. M. Oosterhuis. 1986. A rapid leaf- disc sampler for psychrometric water potential measurements. Plant Physiology 81:684-685.
5. Tyree, M. T., E. L. Fiscus, S. D. Wullschleger and M. A. Dixon. 1986. Detection of xylem cavitation in corn under field conditions. Plant Physiology 82:597-599.
6. Wullschleger, S. D. and D. M. Oosterhuis. 1987. Electron microscope study of cuticular abrasion on cotton leaves in relation to water potential measurements. Journal of Experimental Botany 38:660-667.
7. Oosterhuis, D. M. and S. D. Wullschleger. 1987. Water flow through cotton roots in relation to xylem anatomy. Journal of Experimental Botany 38:1866-1874.
8. Oosterhuis, D. M. and S. D. Wullschleger. 1987. Osmotic adjustment in cotton (*Gossypium hirsutum* L.) leaves and roots in response to water stress. Plant Physiology 84:1154-1157
9. Oosterhuis, D. M., M. L. Parker, S. D. Wullschleger and K. S. Kim. 1988. The citrus leaf cuticle in relation to measurement of leaf water potential using thermocouple psychrometers. Plant, Cell and Environment 11:129-135.
10. Wullschleger, S. D., M. A. Dixon and D. M. Oosterhuis. 1988. Field measurement of leaf water potential with a temperature-corrected *in situ* thermocouple psychrometer. Plant, Cell and Environment 11:129-135.
11. Wullschleger, S. D. and D. M. Oosterhuis. 1989. The occurrence of an internal cuticle in cotton (*Gossypium hirsutum* L.) leaf stomates. Environmental and Experimental Botany 29:229-235.
12. Wullschleger, S. D. and D. M. Oosterhuis. 1989. Water use efficiency as a function of leaf age and position within the cotton canopy. Plant and Soil 120:79-85.
13. Oosterhuis, D. M., H. D. Scott, R. E. Hampton and S. D. Wullschleger. 1990. Physiological response of two soybean [*Glycine max* (L.) Merr] cultivars to short-term soil flooding. Environmental and Experimental Botany 30:85-92.
14. Wullschleger, S. D. and D. M. Oosterhuis. 1990. Photosynthesis of individual field-grown cotton leaves during ontogeny. Photosynthesis Research 23:163-170.
15. Oosterhuis, D. M., S. D. Wullschleger, R. E. Hampton and R. A. Ball. 1990. Physiological response of rice (*Oryza sativa* L.) to fenoxaprop-induced injury. Weed Science 38:459-462.
16. West, C. P., D. M. Oosterhuis and S. D. Wullschleger. 1990. Osmotic adjustment in tissues of tall fescue in response to water deficit. Environmental and Experimental Botany 30:149-156.
17. Wullschleger, S. D. and D. M. Oosterhuis. 1990. Photosynthetic carbon production and use by developing cotton leaves and bolls. Crop Science 30:1259-1264.
18. Wullschleger, S. D. and D. M. Oosterhuis. 1990. Photosynthetic and respiratory activity of fruiting forms within the cotton canopy. Plant Physiology 94:463-469.

19. Oosterhuis, D. M. and S. D. Wulschleger. 1990. Drought tolerance and irrigation scheduling of vegetable crops. *Acta Horticulturae* 278:351-358.
20. Wulschleger, S. D. and D. M. Oosterhuis. 1990. Canopy development and photosynthesis of cotton as influenced by nitrogen nutrition. *Journal of Plant Nutrition* 13: 1141-1151.
21. Hampton, R. E., S. D. Wulschleger and D. M. Oosterhuis. 1990. Impact of *Verticillium* wilt infection on net photosynthesis, respiration, and photorespiration of field-grown cotton. *Physiological and Molecular Plant Pathology* 37:271-280.
22. Wulschleger, S. D. and C. P. P. Reid. 1990. Implication of ectomycorrhizal fungi in the cytokinin relations of loblolly pine. *New Phytologist* 116:681-688.
23. Wulschleger, S. D., J. E. Cahoon, J. A. Ferguson and D. M. Oosterhuis. 1991. SURFTEMP: Simulation of soil surface temperature using the energy balance equation. *Journal of Agronomic Education* 20:11-15.
24. Oosterhuis, D. M., R. E. Hampton and S. D. Wulschleger. 1991. Water deficit effects on the cotton leaf cuticle and the efficiency of defoliant. *Journal of Production Agriculture* 4:260-265.
25. Wulschleger, S. D. and D. M. Oosterhuis. 1991. Osmotic adjustment and the growth response of seven vegetable crops following water-deficit stress. *HortScience* 26:1210-1212.
26. Kirkpatrick, T. L., D. M. Oosterhuis and S. D. Wulschleger. 1991. Interaction of root-knot nematodes and water stress in two cotton cultivars. *Journal of Nematology* 23:462-467.
27. Wulschleger, S. D., D. M. Oosterhuis, R. E. Hurrion and P. J. Hanson. 1991. Evidence for light-dependent recycling of respired CO₂ by the cotton fruit. *Plant Physiology* 97:574-579.
28. Wulschleger, S. D. and D. M. Oosterhuis. 1991. Photosynthesis, transpiration, and water-use efficiency of cotton leaves and fruit. *Photosynthetica* 25:505-515.
29. Wulschleger, S. D., R. J. Norby and D. L. Hendrix. 1992. Carbon exchange rates, chlorophyll concentration, and carbohydrate status of two forest tree species to carbon dioxide enrichment. *Tree Physiology* 10:21-31. **Cited 104 times.**
30. Wulschleger, S. D., P. J. Hanson and R. F. Sage. 1992. PHOTOBIO: Modeling the stomatal and biochemical control of plant gas-exchange. *Journal of Natural Resources and Life Sciences Education* 21:141-145.
31. Wulschleger, S. D. and D. M. Oosterhuis. 1992. Canopy leaf area development and age-class dynamics in cotton. *Crop Science* 32:451-456.
32. Norby, R. J., C. A. Gunderson, S. D. Wulschleger, E. G. O'Neill and M. K. McCracken. 1992. Productivity and compensatory growth responses of yellow-poplar trees to elevated CO₂. *Nature* 357:322-324. **Cited 256 times.**
33. Wulschleger, S. D., R. J. Norby and C. A. Gunderson. 1992. Growth and maintenance respiration in leaves of *Liriodendron tulipifera* L. saplings exposed to long-term carbon dioxide enrichment in the

field. *New Phytologist* 121:515-523.

34. Wullschleger, S. D., P. J. Hanson and C. A. Gunderson. 1992. Assessing the influence of exogenous ethylene on electron transport and fluorescence quenching in leaves of *Glycine max*. *Environmental and Experimental Botany* 32:449-455.
35. Wullschleger, S.D. and R.J. Norby. 1992. Respiratory cost of leaf growth and maintenance in white oak saplings exposed to atmospheric CO₂ enrichment. *Canadian Journal of Forest Research* 22:1717-1721.
36. Edwards, G.S., S.D. Wullschleger and J.M. Kelly. 1993. Growth and physiology of northern red oak: Preliminary comparisons of mature and seedling responses to ozone. *Environmental Pollution* 83:215-221.
37. Hanson, P.J., S.D. Wullschleger, S.A. Bohlman and D.E. Todd. 1993. Seasonal and topographic patterns of forest floor CO₂ efflux from an upland oak forest. *Tree Physiology* 13:1-15. **Cited 198 times.**
38. Wullschleger, S.D. 1993. Biochemical limitations to carbon assimilation in C₃ plants - A retrospective analysis of the A/C_i curves from 109 species. *Journal of Experimental Botany* 44:907-920. **Cited 407 times.**
39. Gunderson, C.A. and S.D. Wullschleger. 1993. Photosynthetic acclimation of trees to a doubling of atmospheric CO₂: A broader perspective. *Photosynthesis Research* 39:369-388. **Cited 227 times.**
40. Gunderson, C.A., R.J. Norby and S.D. Wullschleger. 1993. Foliar gas exchange of two deciduous hardwoods during three years of growth in elevated CO₂: No loss of photosynthetic enhancement. *Plant, Cell and Environment* 16:797-807. **Cited 124 times.**
41. Tschaplinski, T.J., R.J. Norby and S.D. Wullschleger. 1993. Responses of loblolly pine seedlings to elevated CO₂ and fluctuating water supply. *Tree Physiology* 13:283-296.
42. Luxmoore, R.J., S.D. Wullschleger and P.J. Hanson. 1993. Forest responses to CO₂ enrichment and climate warming. *Water, Soil, and Air Pollution* 70: 309-323.
43. Wullschleger, S.D., L.H. Ziska and J.A. Bunce. 1994. Respiratory responses of higher plants to atmospheric CO₂ enrichment. *Physiologia Plantarum* 90:221-229. **Cited 97 times.**
44. Bondada, B.R., Oosterhuis, D.M., Wullschleger, S.D., Kim, K.S. and Harris, W.M. 1994. Anatomical considerations related to photosynthesis in cotton (*Gossypium hirsutum* L.) leaves, bracts, and the capsule wall. *Journal of Experimental Botany* 45:111-118.
45. Wullschleger, S.D., Lynch, J.P. and Berntson, G.M. 1994. Modeling the belowground response of plants and soil biota to edaphic and climatic change - What can we expect to gain? *Plant and Soil* 165:149-160.
46. Wullschleger, S.D., R.J. Norby and P.J. Hanson. 1995. Growth and maintenance respiration in stems of *Quercus alba* after four years of CO₂ enrichment. *Physiologia Plantarum* 93:47-54.
47. Hanson, P.J., L.J. Samuelson, S.D. Wullschleger, T.A. Tabberer and G.S. Edwards. 1994. Seasonal

- patterns of light-saturated photosynthesis and leaf conductance for mature and seedling *Quercus rubra* L. foliage: differential sensitivity to ozone. *Tree Physiology* 14:1351-1366.
48. Norby, R.J., S.D. Wullschleger, C.A. Gunderson and C.T. Nietch. 1995. Increased growth efficiency of *Quercus alba* trees to a CO₂-enriched atmosphere. *New Phytologist* 131:91-97.
 49. King, A.W., W.R. Emanuel, S.D. Wullschleger and W.M. Post. 1995. In search of the missing carbon sink: a model of terrestrial biospheric response to land-use change and atmospheric CO₂. *Tellus* 47B:501-519.
 50. Kelly, J.M., L.J. Samuelson, G. Edwards, P.J. Hanson, D. Kelting, A. Mays and S.D. Wullschleger. 1995. Are seedlings reasonable surrogates for trees? An analysis of ozone impacts on *Quercus rubra*. *Water, Soil, and Air Pollution* 85:1317-1324.
 51. Wullschleger, S.D., P.J. Hanson and G.S. Edwards. 1996. Growth and maintenance respiration in leaves of northern red oak seedlings and mature trees after three years of ozone exposure. *Plant, Cell and Environment* 19:577-584.
 52. Wullschleger, S.D., M.A. Sanderson, S.B. McLaughlin, D.P. Biradar and A.L. Rayburn. 1996. Photosynthetic rates and ploidy levels among populations of switchgrass. *Crop Science* 36:306-312.
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 54. Wullschleger, S.D., P.J. Hanson and D.E. Todd. 1996. Measuring stem water content in four deciduous hardwoods with a time domain reflectometer. *Tree Physiology* 16:809-815.
 55. Sanderson, M.A., R.L. Reed, S.B. McLaughlin, S.D. Wullschleger, B.V. Conger, D.J. Parrish, D.D. Wolf, C. Taliaferro, A.A. Hopkins, W.R. Ocumpaugh, M.A. Hussey, J.C. Read and C.R. Tischler. 1996. Switchgrass as a sustainable bioenergy crop. *Bioresource Technology* 56:83-93.
 56. Post, W.M., A.W. King and S.D. Wullschleger. 1997. Historical variations in terrestrial biospheric carbon storage. *Global Biogeochemical Cycles* 11:99-109.
 57. King, A.W., W.M. Post and S.D. Wullschleger. 1997. The potential response of terrestrial carbon storage to changes in climate and atmospheric CO₂. *Climatic Change* 35:199-227.
 58. Norby, R.J., N.T. Edwards, J.S. Riggs, C.H. Abner, S.D. Wullschleger, C.A. Gunderson, E.G. O'Neill. 1997. Temperature-controlled open-top chambers for global change research. *Global Change Biology* 3:259-267.
 59. Wullschleger, S.D., R.J. Norby, J.C. Love and C.D. Runck. 1997. Energetic cost of tissue construction in yellow-poplar and white oak saplings exposed to long-term CO₂ enrichment. *Annals of Botany* 80:289-297.
 60. Wullschleger, S.D., P.J. Hanson and T.J. Tschaplinski. 1998. Whole-plant water flux in understory red maple exposed to altered precipitation regimes. *Tree Physiology* 18:71-79.
 61. Wullschleger, S.D., F.C. Meinzer and R.A. Vertessy. 1998. A review of whole-plant water use studies in trees. *Tree Physiology* 18:499-512. **Cited 156 times.**

62. Norby, R.J., S.D. Wullschleger, C.A. Gunderson, D.W. Johnson and R. Ceulemans. 1999. Tree responses to rising CO₂ in field experiments: Implications for the future forest. *Plant, Cell and Environment* 22:683-714. **Cited 373 times.**
63. Garten, C.T. and S.D. Wullschleger. 1999. Soil carbon inventories under a bioenergy crop (Switchgrass): Measurement limitations. *Journal of Environmental Quality* 28:1359-1365.
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WORKSHOP PROCEEDINGS – 9 total

POPULAR-PRESS OR TRADE-RELATED PUBLICATIONS – 9 total

ABSTRACTS – 231 total