

Roger Kjelgren
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EDUCATION AND WORK HISTORY:

- 2007-Pres. Interim Department Head, Plants, Soils, and Climate, Utah State University
2007-Pres. International Programs Coordinator, College of Agriculture, Utah State University
2006-Pres. Professor, of Landscape Horticulture, Dept. Plants, Soils, and Biometeorology, Utah State University
1998-2006 Associate Professor of Landscape Horticulture, Dept. Plants, Soils, and Biometeorology, Utah State University
1992-98. Assistant Professor of Landscape Horticulture, Dept. Plants, Soils, and Biometeorology, Utah State University
1988-91 Assistant Professor of Landscape Horticulture, Dept. of Plant and Soil Science, Southern Illinois University, Carbondale Illinois
1985-88 PhD, Forestry. Center For Urban Horticulture, University of Washington, Seattle WA
1980-83 MS, Soil Science. Dept. of Soil Science, Oregon State University, Corvallis OR
1983-85 Research Assistant to Extension Specialist, University of California Kearney Agricultural Center, Parlier CA
1978-80 Post-baccalaureate, Department of Crop Husbandry and Plant Breeding, the Royal Veterinary and Agricultural University, Copenhagen, Denmark
1976-78 BS, Soil Science. Department of Agronomy, Washington State University, Pullman WA

RESEARCH—Appointment 55% Utah Agricultural Experiment Station

Key accomplishments

- Research focus on shade tree water use and water relations in urban microclimates, following transplanting, and under turf competition; production and use of Intermountain West native plants in low water urban landscapes, implementation and assessment of landscape water conservation techniques through water billing data analysis and sociological surveys.
- Career publishing: 47 peer reviewed publications (39 as first or second author), one book.
- Career funding at USU: \$450,000 in competitive federal CSREES funding, \$501,000 in CSREES special allocation, \$700,000 in state of Utah line item, and nearly \$554,000 in other grants and contracts.
- Fulbright scholar at the Faculty of Forestry, Kasetsart University in Thailand, 11/05-5/06, conducting water use studies of street trees in Bangkok.

Specific Research Efforts

1. Publishing (*=corresponding author; student co-authors italicized)

a. Refereed Journal Articles

- Cardoso, G., T. Cerny-Koenig, R. Koenig, and R. Kjelgren.* 2007. Characterizing fertilizer and media pH requirements for greenhouse production of Intermountain West native herbaceous perennials. *Native Plant J.*8:115-121.
- Zollinger, N., R. Koenig, T. Cerny-Koenig, and R. Kjelgren.* 2007. Relative salinity tolerance of Intermountain Western United States native herbaceous perennials. *HortScience* 42:529-534.
- *Kjelgren, R.** 2007. Agricultural experiment station faculty and administrator attitudes and perceptions regarding placing research results on the Internet. *HortTechnology* 17:95-101.

- *Kjelgren, R.**, and T. Cerny-Koenig. 2006. Evaluating a line source irrigation system for determining water requirements of herbaceous perennials . J. Environ. Hort. 24:225–229.
- Cardoso, G., **R. *Kjelgren**, Teresa Cerny-Koenig, and Rich Koenig. 2006. Pot-in-pot production of six Intermountain West native herbaceous perennial species grown in containers. J. Environ. Hort. 24: 77-83.
- Montague, T, and **R. Kjelgren**. 2006. Use of thermal dissipation probes to estimate water loss of containerized landscape trees. J. Environ. Hort. 24:95-104.
- Zollinger, N., **R. *Kjelgren**, T. Cerny-Koenig, K. Kopp, and R. Koenig. 2006. Drought responses of six ornamental herbaceous perennials. Scientia Horticulturae, 109:267-274.
- Dewey, D., P. G. Johnson, and **R. Kjelgren**. 2006. Effects of irrigation and mowing on species diversity of grass and wildflower mixtures for the Intermountain West. Native Plant J. 7:267-278.
- Rupp, L.A. and **R. Kjelgren**. 2006. Stewardship and the concept of yield in landscape water conservation. In "Stewardship and the Creation: LDS Perspectives on the Environment," G.B. Handley, T.B. Ball, and S.L. Peck, Eds. Religious Studies Center, Brigham Young University, Provo, Utah. 204 pp.
- Stewart, R., **R. *Kjelgren**, P. Johnson, and M. Kuhns. 2005. Competition between Linden shade trees and buffalograss and Kentucky bluegrass during establishment: turfgrass depletion threshold and rooting depth. Hortscience 40:1529-1533.
- *Kjelgren, R.**, T. Montague, and R. Beeson. 2005. Water use and stomatal behavior of sweetgum (*Liquidambar styraciflua* L.) relative to reference evaporation in three contrasting regions. Acta Horticulturae 664:353-360.
- Montague, T., **R. *Kjelgren**, R. Allen, and D. Wester. 2004. Water loss estimates for five recently transplanted landscape tree species in a semi-arid climate. J. Environ. Hort. 22:189-196.
- Dewey, D., P. Johnson, and R. Kjelgren. 2004. Species composition changes in a rooftop grass and wildflower meadow: Implication for designing successful mixtures. Native Plants J. 5:56-65.
- Montague T., and **R. Kjelgren**. 2004. Energy balance of six common landscape surfaces and the influence of surface properties on gas exchange of four containerized tree species. Scientia Horticulturae. 100: 229-249.
- Stewart, R., **R. *Kjelgren**, P. Johnson, and M. Kuhns. 2004. Soil-water-use characteristics of precision-irrigated buffalograss and Kentucky bluegrass. Online. Applied Turfgrass Science doi:10.1094/ATS-2004-1118-01-RS.
<http://www.plantmanagementnetwork.org/pub/ats/research/2004/water/>.
- Ferro, A., M. Fefell., **R. Kjelgren**, D. S. Lipson, N. Zollinger, and S. Jackson. 2003. Maintain Hydraulic Control Using Deep Rooted Tree Systems. Pp. 125-156. In: Advances in Biochemical Engineering/Biotechnology, Vole 78. Springer-Verlag, Berlin.
- Montague, D. T., **R. Kjelgren**, and L. Rupp. 2000. Surface energy balance affects gas exchange and growth of two transplanted landscape trees. J. Am. Soc. Hort. Sci. 125:299-309.
- Montague, D. T. and **R. Kjelgren**. 2000. Gas exchange and growth of transplanted, field-grown trees in an arid climate. HortScience. 35:763-768.
- *Kjelgren, R.**, N. Chapman, and L. Rupp. 2000. Tree seedling establishment with protective shelters and irrigation scheduling in three naturalized landscapes in Utah. J. Environ. Hort. 18:238-246.
- *Kjelgren, R.**, L. Rupp, and D. Kilgren. 2000. Water conservation in urban landscapes. HortScience. 35:1037-1043.
- Ferro, A, J. Kennedy, **R. Kjelgren**, J. Rieder, and S. Perrin. 1999. Toxicity assessment of volatile organic compounds in poplar trees. Int. J. Phytoremediation. 1:9-17.
- Cole, J. C., **R. Kjelgren**, and D L. Hensley. 1998. In-ground fabric containers as an alternative nursery crop production system. HorTechnology 8:159-163.
- *Kjelgren, R.** and L. A. Rupp. 1998. Using HortBase in education. HorTechnology 8:301-306.

- Montague, T., **R. Kjelgren**, and L. Rupp. 1998. Surface energy balance affects gas exchange of three shrub species. *J. Arboricult.* 24:254-262.
- ***Kjelgren R.** and T. Montague. 1998. Urban tree transpiration over turf and asphalt surfaces. *Atmosph. Environ.* 32:35-41.
- ***Kjelgren, R.**, and L. Rupp. 1997. Establishment in treeshelters I: shelters reduce growth, water use, and hardiness, but not drought avoidance. *HortScience* 32:1281-1283.
- ***Kjelgren, R.**, T. Montague, and L. Rupp. 1997. Establishment in Treeshelters II: Effect of shelter color on gas exchange and hardiness. *HortScience.* 32:1284-1287.
- Rupp, L., and **R. Kjelgren**. 1997. Effect of annual shearing on growth of five high desert shrubs. *J. Environ. Hort.* 15:123-125.
- ***Kjelgren, R.** and L. Rupp. 1997. Treeshelters improve seedling establishment under herbaceous competition. *Int. Soc. Arbor. J.* 23:131-135.
- ***Kjelgren, R.** 1996. Irrigation timing of tree landscape shrub species based on foliage temperature. *Arboricultural J.* 20:47-57.
- ***Kjelgren, R.**, and T. Montague. 1996. Isolated tree water use over various urban surfaces. pp. 250-256 In: *Evapotranspiration and Irrigation Scheduling, Proceedings of the International Conference.* San Antonio TX, Nov 3-6.
- Goldhamer, D. A., R. H. Beede, G. S. Sibbett, **R. Kjelgren**, R. C. Phene, and D E. Ramos. 1995. Hedgerows use more water, but increase efficiency, profit in young walnuts. *California Agricult.* 49:24-28.
- ***Kjelgren, R.** 1995. Variable urban irradiance and shade acclimation in Norway maple street trees. *J. Arboriculture* 21:145-149.
- ***Kjelgren, R.**, and J. R. Clark. 1994. Urban microclimates and growth of sweetgum street trees. *Arboriculture J.* 18:401-417.
- Cleveland, B. R, and **R. Kjelgren**. 1994. Establishment of six tree species on deep-tilled minesoil during reclamation. *Forest Ecol. Management.* 68:273-280.
- ***Kjelgren, R.**, C. Spihlman, and B. R. Cleveland. 1994. Effect of irrigation on crabapple growth and water relations during field production with in-ground fabric containers. *J. Environ. Hort.* 100-103.
- ***Kjelgren, R.**, B. R. Cleveland, and M. Foutch. 1994. Establishment of white oak seedlings with three handling methods on deep-tilled minesoil during reclamation. *J. Environ. Hort.* 12:96-99.
- ***Kjelgren, R.** and B. R. Cleveland. 1994. Growth and water relations of Kentucky coffee tree and silver maple following transplanting. *J. Environ. Hort.* 12 108-111.
- ***Kjelgren, R.** 1994. Growth and water relations of Kentucky coffee tree in protective shelters during establishment. *HortScience.* 29:777-780.
- Ashby, W. C., D. F. Bresnan, **R. Kjelgren**, P. L. Roth, J. E. Preece, and C. A. Huetteman. 1994. Coppice growth and water relations of silver maple. *Biomass and Bioenergy.* 5:317-323.
- ***Kjelgren, R.**, and J. Clark 1993. Water Relations of *Liquidambar styraciflua* L. in an Urban Canyon. *Int. Soc. Arbor. J.*19:266-270.
- ***Kjelgren, R.**, and J. Clark. 1993. Growth and water relations of *Liquidambar styraciflua* L in an urban park and plaza. *Trees* 7:195-201.
- ***Kjelgren, R.**, and J. Clark. 1992. Photosynthesis and leaf morphology of *Liquidambar styraciflua* L. under variable urban radiant energy conditions. *Int. J. Biometeorol.* 36:165-171.
- ***Kjelgren, R.**, and J. Clark. 1992. Microclimates and tree growth in three urban spaces. *J. Environ. Hort.* 10:139-145.
- Clark, J. R., **R. Kjelgren**, J. Hushagen, and J. Fiore. 1992. Cambial electrical resistance does not assess vitality of individual sweetgum trees. *J. Arboricult.* 18:1-5.
- Clark, J. R., **R. Kjelgren**. 1990. Water and urban Trees. *J. Arboricult.* 16:203-208.
- Clark, J. R., **R. Kjelgren**. 1989. Conceptual tree planting. *J. Arboricult.* 15:229-236.

b₁. Research Manuscripts in press

- ***Kjelgren, R.**, L. Puangchit, C. Sriladda, and M. Someechai. 2008. Water use of four street tree species in Bangkok, Thailand. *Acta Horticulturae*.
- *B. Thaiutsa, **R. Kjelgren**, L. Puangchit, and W. Arunpraparut. 2008. Urban green space, street tree and heritage large tree assessment in Bangkok, Thailand. *Urban Forestry and Urban Greening*.
- Endter-Wada, J., J. Kurtzman, S. Kenan, **R. Kjelgren**, and C. Neale. 2008. Situational waste in landscape watering: residential and business water use in an urban Utah community. *J. Amer. Water Res. Assoc.*

b₂. Research Manuscripts submitted

- ***Kjelgren, R.**, L. Wang, and D. Joyce. 2008. Water deficit stress Responses of three herbaceous native Australian ornamental species. *J. American Soc. Hort. Sci.*
- Gunnel, J. D., P. Grossl, and **R. *Kjelgren**. 2008. Nitrogen and media assessment for first-year pot-in-pot production of container and bare root liners in the Intermountain West. *J. Environ. Hort.*
- Caron, M., **R. *Kjelgren**, L. Rupp. Establishment of balled and burlapped and bare root trees of different sizes. *J. Hort. Sci Biotech.*

b₃. Articles in preparation

- Kilgren, D., **R. *Kjelgren**, J. Endter-Wada, and P. Johnson. Implementing water conservation in an institutional setting. *To be submitted to HortTechnology*
- Hernandez Leos B., and **R. *Kjelgren**. Maple (*Acer platanoides*) growth and water relations under turf competition. *to be submitted to Int. Soc. Arboricult. J.*
- Farag, F., C. Neale, **R. *Kjelgren**, and J. Endter-Wada. Estimating landscape irrigated areas and potential water conservation at the rural-urban interface using remote sensing and GIS. *to be submitted to Photogrammetric Eng. and Remote Sensing*
- Farag, F., C. Neale, **R. *Kjelgren**, and J. Endter-Wada. Water Conversion from Agricultural to Urban use at The Rural-Urban Interface Using Remote Sensing and GIS. *to be submitted to Journal of the American Water Resources Association.*

c. Theses and dissertations

- Kjelgren, R. 1988. Urban microclimate effects on the growth and performance of *Liquidambar styraciflua* L. Ph.D. Dissertation, University of Washington.
- Kjelgren, R. 1984. Fertilizer nitrogen use efficiency by winter wheat in the Willamette Valley. Oregon State University

d. Books

- W. Mee, J. Barnes, **R. Kjelgren**, R. Sutton, T. Cerny, C. Johnson. 2003. Waterwise: native plants for Intermountain landscapes. 220 pp. USU Press, Logan, UT. (*first two authors were landscape architecture students who I directed in assembling the data; I wrote all narrative text and organized the book*)

e. Proceedings

- Kjelgren, R.**, F. Fayek, C. Neale, J. Endter-Wada, J. Kurtzman. 2002. Quantifying potential urban landscape water conservation through billing data analysis in Layton, Utah. In: Proceedings, American Water Works Association Sources 2002: Reuse, Resources, Conservation, January 27-31, Las Vegas, NV. CDROM publication.
- Ferro, A., **R. Kjelgren**, D. Turner, B. Chard, T. Montague, and J. Chard. 2000. Phytoremediation systems designed to control contaminant migration. In: EPA Phytoremediation: State of the Science Conference, Boston, MA May 1-2.
- Kjelgren, R.**, F. A. Farag, and C. Neale. 2000. Analyzing water demand in urban landscapes. pp. 469-473. In: American Society for Agricultural Engineers Decennial National Irrigation Symposium, November 14-16, Phoenix AZ.

- Farag, F. A., **R. Kjelgren**, and C. Neale. 2000. Analyzing water demand in urban landscapes. pp. 325-327. In: American Water Resources Association Annual Conference, November 6-9, Miami FL.
- Farag, F. A., C. Neale, and **R. Kjelgren**. 2000. Development of a GIS-based model to estimate landscape water demand in the urban-rural interface. In: Proceeding of Remote Sensing and Hydrology 2000 Symposium, April 2-7, 2000, Santa Fe, New Mexico, USA. International Commission on Remote Sensing of the International Association of Hydrological Sciences.
- Kjelgren, R.**, F. A. Farag, C. Neale, and D. Itenfisu. 1999. Determining conservable landscape water through remote sensing. *In* 1999 proceedings of the Irrigation Association, Nov. 7-9, Orlando FL, pp 193-197.
- Farag, F.A., C. Neale, **R. Kjelgren**, and D. Itenfisu. 1999. Estimating urban landscaped vegetated areas using airborne multispectral imagery and GIS. *In* Proceedings of the 17th Biennial workshop on Color Photography and Videography in Resource Assessment. May 4-6, Reno, NV, pp. 123-135.
- Kjelgren, R.**, and T. Montague. 1996. Isolated Tree Water Use in Various Urban Surfaces ASAE International Conference on Evapotranspiration and Irrigation Scheduling. San Antonio, TX Nov. 3-6.
- Kjelgren, R.**, and B. Foley. 1992. The effect of crown shape on sprinkler irrigation in a container nursery. pp. 124-125 *in* 1991 Irrigation Association International Exposition and Technical Conference.
- Kjelgren, R.** 1990. Irrigation scheduling of woody landscape plants based on foliage temperature. pp 635-640. *in* Visions of the Future, Proc. 3rd Nat. Irri. Symp. Oct 28, 1990, Phoenix AZ.
- Clark, J., **R. Kjelgren**, D. Wang. 1989. Growth and development of urban trees. pp. 290-305 *in* Proc. Workshop on Saving Energy to Reduce Atmospheric Pollution by Controlling Summer Heat Islands. L. Garbesi, M. Akbari, and P. Martin (eds). Berkley CA
- Clark, J. and **R. Kjelgren**. 1990. Environmental factors affecting urban tree growth. pp. 88-92. *in* Proc. 4th Urban Forestry Conf. P. Rodbell (ed.) Am. For. Assoc. Wash. D.C.
- Kjelgren, R.**, D. Goldhamer, K. Uriu, S. Weinbaum. 1986. Almond tree response to variable nitrogen fertilization rates through low volume sprinklers. pp. 377-381. *in* Proceedings of the 3rd International Drip/Trickle Irrigation Congress Vol I. Nov. 17-21, 1985. Fresno, CA.
- Goldhamer, D., **R. Kjelgren**, L. Williams, R. Beede. 1986. Water use requirements of pistachio trees and response to water stress. pp. 216-223. *in* Proceedings of the National Symposium on Advances in Evapotranspiration. Dec. 16-17, 1985. Chicago, IL.
- Goldhamer, D., **R. Kjelgren**, M. Moore, J. Lane. 1985. Low volume sprinkler surface and subsurface distribution uniformity. pp. 851-858. *in* Proceedings of the 3rd International Drip/Trickle Irrigation Congress Vol. II. Nov. 17-21, 1985. Fresno, CA.
- Fischer, B., D. Goldhamer, T. Babb, **R. Kjelgren**. 1985. Preemergence herbicide performance under drip and low volume sprinkler irrigation. pp. 486-490. *in* Proceedings of the 3rd International Drip/Trickle Irrigation Congress Vol. I. Nov. 17-21, 1985. Fresno, CA.
- Phene, R., J. Menezes, D. Goldhamer, G. Aitkens, R. Beede, **R. Kjelgren**. 1985. Irrigation scheduling of drip irrigated pistachios. pp. 808-810. *in* Proceedings of the 3rd International Drip/Trickle Irrigation Congress Vol. II. Nov. 17-21, 1985. Fresno, CA.

f. Abstracts and presentations at scientific meetings

- Myers-Roche, C. and **R. Kjelgren**. 2005. Evaluating student attitudes towards an interdisciplinary professional masters degree specializing in landscape water conservation as compared to a conventional MS degree. ASHS Annual Meeting, July 18-21, Las Vegas.
- Zollinger, N., **R. Kjelgren**, T. Cerny-Koenig, and R. Koenig. 2005. Drought tolerance of selected native and adapted perennial herbaceous wildflowers. ASHS Annual Meeting, July 18-21, Las Vegas.

- Zollinger, N., **R. Kjelgren**, T. Cerny-Koenig, and R. Koenig. 2005. Salt tolerance of selected native and adapted perennial herbaceous wildflowers. ASHS Annual Meeting, July 18-21, Las Vegas.
- Cardoso, G., **R. Kjelgren**, T. Cerny-Koenig, and R. Koenig. 2005. Pot-in-pot production of Intermountain West native perennial wildflowers. ASHS Annual Meeting, July 18-21, Las Vegas.
- Kjelgren, R.**, P. Johnson, K. Kopp. 2004. Urban landscape water conservation research. USU Water Initiative Runoff Conference, March 3, Logan UT.
- Endter-Wada, J., J. Kurtzman, **R. Kjelgren**, and D. Kilgren. 2004. Understanding Water Conservation. USU Water Initiative Runoff Conference, March 3, Logan UT.
- Kjelgren R.** and T. Cerny. 2004. Drought tolerance of western native perennial wildflowers using line source irrigation. AAASPD Annual Meeting, June 13-15, Logan Utah State University.
- Kjelgren, R.** 2004. The changing face of the high desert urban landscape. AAASPD Annual Meeting, June 13-15, Logan Utah State University.
- Zollinger, N., **R. Kjelgren**, and T. Cerny. 2004. Salt and drought tolerance of perennial wildflowers. AAASPD Annual Meeting, June 13-15, Logan Utah State University
- Cardoso, G., **R. Kjelgren**, and T. Cerny. 2004. Pot-in-pot production of Intermountain West native perennial wildflowers. AAASPD Annual Meeting, June 13-15, Logan Utah State University.
- Farag, F., C. Neale, **R. Kjelgren**, and N. Yakoub (2004). "Quantifying potential water conservation for landscape vegetation in Egypt by integrating remote sensing and GIS". The proceedings of the Regional Arab Water Conference 2004, Cairo Egypt April 13, 2004.
- Kjelgren, R.**, T. Montague, and R. Beeson. 2004. Water use and stomatal behavior of sweetgum (*Liquidambar styraciflua*) relative to reference evapotranspiration in three contrasting regions. ASHS Annual Meeting, July 17-20, Austin TX.
- T. Cerny, K. Kopp, and **R. Kjelgren**. 2003. Educating large urban landscape water users. ASHS Annual Meeting, October 2-3, Providence Rhode Island.
- R. Kjelgren** and T. Cerny. 2003. Production of Intermountain West native perennial wildflowers using pot-in-pot production. ASHS Annual Meeting, October 2-3, Providence Rhode Island.
- T. Cerny and **R. Kjelgren**. 2003. Using line source irrigation to evaluate potential low water Use Herbaceous Perennials. ASHS Annual Meeting, October 2-3, Providence Rhode Island.
- R. Kjelgren**, T. Montague, and R. Beeson. 2003. Water use and stomatal behavior of sweetgum (*Liquidambar styraciflua*) relative to reference evapotranspiration in three contrasting regions. ASCE 4th annual Irrigation Symposium, September 1-3, Davis California.
- Kjelgren, R.**, F. Fayek, C. Neale, J. Endter-Wada, and J. Kurtzman. 2002. Quantifying potential urban landscape water conservation through billing data analysis in Layton, Utah. In: Proceedings, American Water Works Association Sources 2002: Reuse, Resources, Conservation, January 27-31, Las Vegas NV. (See Research Appendix for reprint)
- Kjelgren, R.** and R. Stewart. 2001. Poplar Sap Flow Measured by Thermal Dissipation Probes as Compared to Load Cells. ASHS Annual Meeting, July 23-25, Sacramento CA.
- Montague, T. and **R. Kjelgren**. 2001. Water loss estimates for five landscape tree species. ASHS Annual Meeting, July 23-25, Sacramento CA.
- Kjelgren, R.**, K. Kopp, F. Farag, C. Neale, J. Endter-Wada. 2001. Landscape water demand analysis. Am. Water Works Assoc. Intermountain Section Annual meeting, Sept. 10-14, Mesquite NV.
- Ferro, A., **R. Kjelgren**, D. Turner, B. Chard, T. Montague, and J. Chard. 2000. Phytoremediation systems designed to control contaminant migration. In: EPA Phytoremediation: State of the Science Conference, May 1-2, Boston MA.
- Kjelgren, R.**, F. A. Farag, and C. Neale. 2000. Analyzing water demand in urban landscapes. pp. 469-473. In: American Society for Agricultural Engineers Decennial National Irrigation Symposium, November 14-16, Phoenix AZ.

- Farag, F. A., R. Kjelgren, and C. Neale.* 2000. Analyzing water demand in urban landscapes. pp. 325-327. In: American Water Resources Association Annual Conference, November 6-9, Miami FL.
- Farag, F. A., C. Neale, and R. Kjelgren.* 2000. Development of a GIS-based model to estimate landscape water demand in the urban-rural interface. In: Proceeding of Remote Sensing and Hydrology 2000 Symposium, USA. International Commission on Remote Sensing of the International Association of Hydrological Sciences, April 2-7, Santa Fe New Mexico.
- Kjelgren, R., F. A. Farag, C. Neale, and D. Itenfisu.** 1999. Determining conservable landscape water through remote sensing. 1999 Irrigation Association annual meeting, Nov. 7-9, Orlando FL.
- Farag, F. A., C. Neale, R. Kjelgren, and D. Itenfisu.* 1999. Estimating urban landscaped vegetated areas using airborne multispectral imagery and GIS. 17th Biennial workshop on Color Photography and Videography in Resource Assessment. May 4-6, Reno, NV.
- Kjelgren, R. and B. A. Hernandez-Leos.** 1998. Landscape tree water uptake under herbaceous competition. Landscape Below Ground II Conference, sponsored by the International Society of Arboriculture. March, 5-7, San Francisco.
- Kjelgren, R. and L. A. Rupp.** 1998. Work with Intermountain West native plants at Utah State University. Native plant conference sponsored by Red Butte Gardens/University of Utah, November 19-21, Salt Lake City UT.
- Kjelgren, R. and T. Montague.** 1996. Isolated tree water use over various urban surfaces. Evapotranspiration and Irrigation Scheduling, Proceedings of the International Conference, Nov 3-6, San Antonio TX.
- Kjelgren, R. and Larry Rupp.** 1995. Modeling water use of shade trees in field production nurseries. Invited presentation. Annual Meeting of the Pacific Division AAAS and its Affiliated Societies and Section, June 19-23, 1995, University of British Columbia.
- Kjelgren, R. and Larry Rupp.** 1995. Avenues of Distance Education: Highways, Biways, and Dead ends Invited talk Annual Meeting of the Pacific Division AAAS and its Affiliated Societies and Section, June 19-23, 1995, University of British Columbia.
- Kjelgren, R. and Larry Rupp.** 1995. Shelters improve tree establishment under herbaceous competition. Poster presented at ASHS national meeting, July 31-August 3, Montreal Canada.
- Montague, T., R. Kjelgren, and L. Rupp.* 1994. Effect of treeshelter color on growth and gas exchange of green ash and Norway maple. ASHS-WR meeting, June 3, San Francisco CA.
- Kjelgren, R.** 1994. Shading in urban canyons affects growth of Emerald Queen Maple ASHS-WR meeting, June 3, San Francisco CA.
- Kjelgren, R., T. Montague, and L. Rupp.** 1994. Effect of surface properties on water of Norway maple and crabapple. ASHS Annual Meeting, Corvallis OR, August 1994.
- Kjelgren, R. and L. Rupp.** 1993. Water use of green ash and Norway maple in treeshelters. ASHS Annual meeting, July, Nashville, TN.
- Kjelgren, R. and L. Rupp.** 1993. Effect of different irrigation rates on growth and water relations of London plane tree and globe willow. ASHS-WR Annual meeting, June, Missoula MT

2. Grant Proposals Funded (sole PI unless otherwise indicated)

AGENCY	TITLE	YEAR	AMOUNT
Utah Department of Agriculture	Evaluating Eriogonum corymbosum for Nursery Production and Use in Low Water Landscapes YEAR 2	2008	\$15,000
Jordan Valley Water Conservancy District	Water Check Program (co-PI Kelly Kopp)	2008	\$117,000
USDA Cooperative States Research, Education and Extension Service special allocation earmark	Drought Management, Utah	2008	\$240,000 (\$36,000 Kjelgren)
Jordan Valley Water Conservancy District	Water Check Program (co-PI Kelly Kopp)	2007	\$82,330
Utah Department of Agriculture	Evaluating Eriogonum corymbosum for Nursery Production and Use in Low Water Landscapes	2007	\$11,500
USDA Cooperative States Research, Education and Extension Service special allocation earmark	Drought Management, Utah	2005-06	\$727,827 (Kjelgren=\$28,000)
Jordan Valley Water Conservancy District	Water Check Program (co-PI Kelly Kopp)	2006	\$86,862
Utah State University Community/University Research Initiative Grant Program	Evaluation of Competition Between Turfgrasses and Trees: Rooting Dynamics and Characteristics (Kelly Kopp co-PI)	2005-05	\$35,000
USDA Cooperative States Research, Education and Extension Service special allocation earmark	Drought Management, Utah	2005-06	\$727,827 (Kjelgren=\$28,000)
Jordan Valley Water Conservancy District	Water Check Program (co-PI Kelly Kopp)	2005	\$101,587
USDA Cooperative States Research, Education and Extension Service special allocation earmark	Drought Management, Utah (co-PI David Chandler)	2004-05	\$626,826 (Kjelgren \$250,730)
Bureau of Reclamation, Provo	Eddy Covariance measurements of turfgrass water use in the Intermountain West (co-PI's Kelly Kopp and Paul Johnson)	2003	\$20,000
Utah Agricultural Experiment Station	Production and Use of Intermountain West Native Plants for Low Water Landscapes, Project #UTA00442	2002-2007	\$12,5000 /yr
Jordan Valley Water Conservancy District	Landscape Irrigation Workshops for the Wasatch Front-Year 2 (collaborator)	2002	\$40,000
Jordan Valley Water Conservancy District	Landscape Irrigation Workshops for the Wasatch Front-Year 1 (collaborator)	2001	\$40,000

Utah Division of Water Resources, Dept. of Natural resources	Improving Water Loss Estimate for Kentucky Bluegrass in the Mountain West Using Advanced Micrometeorological Techniques (co-PI)	2001	\$15,000
Bureau of Reclamation, Provo	Improving Water Loss Estimate for Kentucky Bluegrass in the Mountain West Using Advanced Micrometeorological Techniques (co-PI)	2001	\$25,000
Western Region Sustainable Agriculture Research and Education	Production of drought-adapted Intermountain native plants through low-cost in-ground containers for emerging western markets	2001-04	\$71,686
Utah Department of Agriculture	Production of drought-adapted Intermountain native plants through low-cost in-ground containers for emerging western markets	2001	\$16,000
Bureau of Reclamation, Provo	Developing two techniques for determining irrigated area in analyzing urban landscape water demand as applied to West Jordan, UT	2001	\$12,000
State of Utah	Center for Water Efficient Landscaping, a bill funded by Utah State Legislature.	1999 - Ongoing	\$100,000
Scientific Applications, International Corp.	Root system of a deep-rooted poplar at an Ogden, Utah superfund site	1999	\$15,157
Bureau of Reclamation, Provo	Analysis for implementing landscape water budgeting-auditing	1999	\$8,000
Bureau of Reclamation, Provo	Landscape water conservation in Granite School District by irrigation auditing and scheduling	1998	\$8,000
Bureau of Reclamation, Provo	Developing water use coefficients for woody landscape plants for use in water budgeting	1998	\$6,000
Scientific Applications, International Corp.	Measuring water use of direct-rooted poplar poles at the former Chevron Terminal in Ogden, UT	1998	\$9,527
Utah Cooperative Extension	Introduction of uncommonly used shade trees for Utah	1998	\$6,500
USDA National Research Initiative	Farm and landscape water allocation and conservation at the rural:urban interface	1997 - 2002	\$246,357
Utah Agricultural Experiment Station	Water Management in Woody Landscape Plants. Project #UTA00442	1997 - 2002	\$15,000 /yr
Bureau of Reclamation	Implementing Irrigation Scheduling for a School District in Salt Lake City	1997	\$10,000
USU Multimedia grant	Developing a web page for a course in	1997	\$10,000

	sustainable landscaping		
Bureau of Reclamation	Development of multimedia tools in teaching precision landscape irrigation	1996	\$14,000
Bureau of Reclamation	Implementing irrigation scheduling for a school district in Salt Lake City	1996	\$16,000
USDA Challenge grant	Developing an accessible undergraduate curriculum in landscape horticulture	1995-97	\$135,000
Bureau of Reclamation	Implementing irrigation scheduling for a school in Salt Lake City	1995	\$23,000
Utah Water Conservation Forum	Determination of landscaped area for Granite School District Schools through aerial imagery	1995	\$4,000
Utah Water Conservation Forum	Water use and growth of three native shrub species when sheared	1995	\$7,500
Central Utah Water Conservation District	Development of an educational package in landscape water auditing and irrigation scheduling	1995	\$33,000
Utah Mineral Lease Funds	Determining water use in turf-type crested wheatgrass	1995 1994	\$13,500 \$14,250
Utah Mineral Lease Funds	Water conservation techniques for turfgrass in the landscape	1995	\$14,500
Utah Mineral Lease Funds	Evaluating performance of 10 shade trees in various Utah climates	1995	\$39,000
Bureau of Reclamation	Tree water use under variable surface conditions	1994	\$20,000
International Society Arboriculture	Modeling tree water use following transplanting	1994	\$3,000
USU Faculty Grant	Estimating water use of landscape trees from potential evapotranspiration	1992-94	\$28,400
Hill Air Force Base Legacy grant	Drought tolerant tree	1993	\$15,000
Bureau of Reclamation	Modeling tree water use	1993	\$10,000
Utah Agricultural Experiment Station	Water Management in Woody Landscape Plants. Project #UTA00442	1992 - 1997	\$15,000 /yr
Bureau of Reclamation	Modeling tree water use	1992	\$10,000

3. Sabbatical

One year sabbatical, November 2005-November 2006.

- Six months (Nov. 05-May 06) on research/teaching Fulbright Scholar award at Kasetsart University, Bangkok, in the College of Forestry. Conducted research into water use of tropical trees for use as urban street trees, and consulted on an urban forestry masters curriculum. Two articles in press and two in preparation
- Six months (May 06-Nov 06) at Center for Native Floriculture at University of Queensland, Australia, in College of Agriculture and Natural Resources; will conduct research into water relations and drought tolerance of native Australian woody plants in urban environments. One article submitted

TEACHING—appointment 35%

Key Accomplishments

- Leader in innovative teaching, including developing CD-based courses for asynchronous learning, and then the Master's of Professional Studies in Horticulture: Water Efficient Landscaping Specialization (MPSH:WELS) , a one-of-a kind one-calander year professional masters degree program
- Directed or co-directed three PhD students, six MS students and 19 MPSH:WELS students while at USU

Specific Teaching Efforts

1. MPSH:WELS.

I developed one-year degree program, Masters of Professional Studies in Horticulture:Water Efficient Landscaping Specializaion (MPSH:WELS). MPSH:WELS is a Plan C, terminal degree program to provide an advanced training, cross disciplinary educational opportunity that meshes a horticultural background with coursework in communication skills, water policy, and advanced water conservation techniques such that graduates can develop an effective program in landscape water conservation when employed in either the public or private sector. It consists of 29 classroom semester credits and four credits of summer internship experience working for a firm or business with a stake in landscape water management where the student conducts a small research project on some facet of landscape water conservation. The program has graduated 21 students since 2002. Nearly all students are employed in positions relating to landscape water conservation and provide the basis for a network of employment opportunities for future students.

2. Courses Taught.

Specific Teaching Responsibilities for MPSH:WELS Program

PLSC 6100/5100-3 La ndscape Irrigation Management (2002-04)

Background physical processes that drive the plant demand for water necessary for normal growth, sprinkler irrigation systems used to deliver water to meet that demand, and techniques and recent technology for managing plants and irrigation systems to ensure the most efficient use of that water.

PLSC 6230-1 Horticultural Landscape Water Management Readings (2002-04)

Explores readings regarding the social, political, and environmental factors driving irrigation in general and landscapes in particular, and covers current readings in landscape irrigation management and low water landscaping as a means to conserving water.

PLSC 6240-2 Horticultural Landscape Water Management Seminar

This course is a series of exercises in writing about summer internship experiences, including a press release, supervisor report, position description/role statement, culminating in the final report on the specific project worked on during summer internship that will be the student's culminating scholarly activity. Students will also develop public speaking skills by giving several oral presentations with visual aids, including a presentation on their internship project to the entire department.

PLSC/LAEP 6400-3 Planting Design for Low Water Use Landscapes (2002-04)

Cross-disciplinary exploration of the climatic and soil factors that determine aridity, arid zone plant communities in the Intermountain West, and plant physiological responses to water stress as the context for creating low water urban landscapes. Drawing upon this context, students will learn to design low water landscapes through inspiration of natural pattern of native habitats, proper site analysis, mass-space drawings, planting plans and plant selection, and physical and irrigation layout,

with an emphasis on using native plants to create a look characteristic of the Intermountain West. Nursery sourcing and maintenance also presented.

PLSC 6900-4 MPSH:WELS internship experience (2002-04)

Work experience with a private firm or public institution in landscape water conservation. Students will develop a project addressing some aspect of landscape water conservation, collect data, and develop a culminating report. Past projects have included a survey of visitor attitudes towards a low water demonstration garden, an irrigation system assessment of state park landscapes, public response to free landscape irrigation system evaluations, and the economics of converting a homeowner's association turfgrass landscape to low water landscaping.

PLSC 4100-3 Landscape Water Conservation (1999-2001)-CDROM course

How the soil-plant-air continuum determines the desire for landscape irrigation; elementary principals of proper irrigation design; landscapes water budgets and precision irrigation management, low water landscaping, and how to implement water conservation/water efficient landscaping methods.

PLSC 3400 Sustainable Landscape Management-3 (1998-2001) -CDROM course

Presents the background, methodology, and implementation of sustainable landscaping with an emphasis on understanding and applying ecophysiological knowledge to proper plant selection and maintenance .

PLSC 360 Arboriculture (1992-97)

Basic physiology, environmental interaction, and maintenance of commonly used woody landscape plants. Topics to include, pruning, fertilization, transplanting, irrigation, diagnosis of problems, and appraisal.

PLSC 340 Landscape Management in the Interior West (1992-97)-Satellite Course

Presents the information that enters into the decisions a landscape manager makes in conditions unique to the Interior West, in particular covering underlying concepts of plant physiology and ecology to practical maintenance issues such as fertilization, irrigation, and plant selection.

PLSS 432-4 Nursery Management-Southern Illinois University (1988-91)

Principles and practices in both fields and container production or ornamental landscape materials and

PLSS 327-3 Landscape Plant Materials Southern Illinois University (1988-91)

Identification, usage and adaptability to the landscape of woody (deciduous and evergreen) and ornamental shrubs, trees and vines.

3. Graduate Students advised:

1991 Brenda Cleveland SIU, MS.

1998 Thayne Montague, PhD. Factors affecting gas exchange and growth of woody landscape plants in an arid environment.

1999 Bertha Hernandez-Leos, PhD. Water uptake, water relations, tree growth, and root distribution under herbaceous competition.

2001 Molly Waters, MS. An assessment of the feasibility of implementing landscape water demand analysis conservation tools.

2001 Ryan Stewart, MS. Growth and water relations of balled and burlapped littleleaf linden during establishment in precision.

- 2002 Fayek Farag, PhD. Farm and landscape water allocation and conservation at the rural:urban interface (co-advisor with Dr. Christopher Neale, Biological and Irrigation Engineering Dept.).
- 2002 MPSH:WELS Jalene Hunt, Rachel Lopez, David Rice, Clifton Smith.
- 2003 Amy Croft, MS. The production of native and adapted plants for the Intermountain West using the pot-in-pot production system.
- 2003 Sarah Rosenkrantz MS-plan B. Report on the Water Check program: an analysis of Salt Lake City audits.
- 2003 MPSH:WELS: Tiffany Graham, Anne Haueter, Jennie Marshall, Judy Stockton.
- 2004 MPSH:WELS: Talia Buroker, Mark Guthrie, Jerry Hunsaker, Sue Robison.
- 2005 MPSH:WELS: Jerry Hunsaker, Heather Johnson, Cable Jones, Cade Turner, Desire Van Dyke
- 2005 Guillermo Cardoso, MS. Production of Intermountain West native perennial wildflowers using pot-in-pot production versus conventional above ground production.
- 2005 Nickolee Zollinger, MS. Evaluating drought and salt tolerance of ornamental herbaceous perennials (Co-PI with Kelly Kopp).
- 2006 Tony McCammon. MS. Public perceptions and drought stress in three landscape types varying in drought tolerance (co-advisor with Kelly Kopp, Plants, Soils, and Climate dept..
- 2006 Megan Guenter. MS. Survey of garden center attitudes to selling Intermountain Native plants.
- 2007 MPSH:WELS: Dale Roberts, Kristopher Sagers

Current graduate students

- Kurt Rashall, MS. Water use and stomatal behavior in the putatively anisohydric species *Morus alba*.
- Nisa Leksungnoen, Ph.D. Interaction of salt and drought tolerance in salt and tree species varying in native habitat.

4. Other teaching activities:

- Developed two courses, PS 3400-Sustainable Landscaping-3 and PS 4100-3 Landscape Water Conservation on narrated CDROM for asynchronous delivery to time constrained and placebound students funded by a USDA-CSREES Educational Challenge grant.
- Fulbright award to Kasetsart University, Bangkok Thailand, November 2005-May 2006

Other—Administration, Professional Development, Outreach, Service—appointment 10%

Key accomplishments

- Interim department head, Plant, Soils, and Climate 1 September 2007 to 30 July 2008
- Direct the Center for Water Efficient Landscaping program.
- Attended Experiment Station Council on Policy leadership training program, 2004-05
- Sabbatical to Thailand and Australia 2005-06.
- Developed bi-annual native plant symposium, helped initiate Utah's Choice native plant marketing program, advised on the state Waterwise Plant Tag program.

Specific Efforts

1. Administration

- Interim head, department of Plants, Soils, and Climate, directing re-organization undergraduate curriculum. Overseeing creation of a residential design and management degree, and current revising plant science and soil curricula to incorporate concept of

sustainability as a central identity throughout undergraduate curricula.

Coordinating with all departments in the College of Agriculture to develop an appropriate model for hiring a statistical consultant.

- International programs coordinator, College of Agriculture developing sustainable partnerships with universities in developing countries:
 - Thailand: Working on signing institutional level Memorandum of Understanding between Kasetsart University (KU) and Utah State University (USU). Developing college level academic collaborations between KU-Faculty of Agriculture (KUFA) and KU-Faculty of Forestry (KUFF). Specifically working on undergraduate study abroad opportunities in the KUFA Tropical Agriculture program that is taught in English to students from around SE Asia as well as Thailand. USU students will be trained in Teaching English as a Foreign Language such that they will trade English language training for tuition. Also developing short course for KUFA/KUFF lecturers and graduate students in scientific English and manuscript preparation to build their capacity to publish in international journal.
 - Working with Hanoi University of Agriculture Faculty of Agronomy to send USU undergraduates to assist in teaching agronomy curriculum in English to select Vietnamese students, and to provide English language coaching to students and lecturers
 - Developing undergraduate research abroad program with Northwest Agricultural and Forestry University in Shaanxi province and concurrently will be paid to provide English language coaching and training.
 - Leading an undergraduate study abroad tour in plant science and horticulture to Singapore, Thailand, and Vietnam to give USU plant science students an exposure to Asia and challenge their own way of thinking.
 - Creating scientific English short course to train Vietnamese and Thai lecturers in how to craft their research data into manuscripts that can be published in international scientific journals.
 - Developing partnership with Michael Okpara University of Agriculture-Umudike in Nigeria by hosting two of their lecturers for biotech shortcourse.
- Director, Center for Water Efficient Landscaping (CWEL). Funded 1999, encompasses three additional colleagues in turf and ornamentals extension/research. The mission of CWEL is "To promote water conservation and quality in irrigated horticultural landscapes by developing and disseminating information on demand-side management through effective irrigation and sustainable landscaping to the green industry, water purveyors, and cooperative extension". I am responsible for overseeing the state line item, current federal earmark, contract budgets, developing further funding opportunities, mentoring junior faculty, overseeing development of a web page for disseminating Extension and research information. CWEL is reviewed by an outside board of industry and government representatives with a stake in landscape water conservation.
- Director, MPSH:WELS. Recruit students, oversee graduate school paperwork, assist students in locating employment.

2. Professional Development

- ESCOP (Experiment Station Committee on Policy) leadership training program. Phase I training program in Indianapolis June 27-July 1, 2004; Phase II project, survey of faculty and administration attitudes towards using the Internet to disseminate Agricultural Experiment Station-funded research results; Phase III, three day, Feb. 27-March 1, experience in Washington DC with agricultural research policy, Cooperative States Research, Extension and Education Service, and visit with state congressional delegation.

- Sabbatical, November 2005-November 2006. Six months at Kasetsart University in Bangkok, the premier Thai agricultural school, and six months at the Center for Native Floriculture at the University of Queensland in Australia.

3. Outreach.

- Landscape Horticulture Field Day. Initiated 1996, offered bi-annually to showcase woody plant and turfgrass research. Attendance 110-140, and attendee surveys verifying favorable response to presenting research findings through field days.
- Native Plant Symposium. Initiated 1999, I have bi-annually offered a native plant symposium where expert, both from USU and outside, gave presentations on production, selection, and use of Intermountain West native plants in ornamental landscapes. Initially a full day in 1999, subsequent symposia have been offered in the afternoons of the field days. Attendance from 110-130, and surveys of attendees have shown it to be a very positive experience.
- Utah's Choice Program This program was conceived by myself, Janett Warner, native plant grower from Richfield Utah, and Susan Meyer, seed physiologist with the Forest Service shrub lab in Provo to promote 40 Utah native trees, shrubs, perennial wildflowers, and grasses for use in low water landscapes. The Center for Water Efficient Landscaping and Utah Botanical Center donated \$4,000 each in 2003 to the Intermountain Native Plant Growers Association (INPGA) to purchase pot tags, nursery placards, and posters, and to put up a web site. The INPGA has solicited membership in the program from several large nurseries from Arizona and New Mexico as well as local nurseries, and is selling pot tags and placards to support the program to any nursery willing to carry these plants. Within this first year the program has nearly reached a break-even point, and is anticipating solid growth in the future
- WaterWise Plant Tag Program. As director of CWEL, I am a member of this program whose mission is to assist Utah citizens in identifying water-wise plants for our region, we have developed a program to recognize desirable low water use species. CWEL also supported the start up of this program with \$1,000. Representatives from several other government and local organizations have worked together to organize a list of ornamental trees, shrubs, herbaceous perennials, ornamental grasses, and ground covers that are drought tolerant, adapted to Utah's arid climate and cold winters, available in the industry, relatively easy to maintain in the landscape, and have desirable landscape characteristics which remain desirable under limited water availability.
- Extension talks. While not having an explicit Extension appointment, I generally give from 3-5 major Extension talks around the country on landscape water conservation, landscape tree water use, and selection of woody plants. A sampling from 2002-2008 include:
 - 2008 Feb. 12. Talk to Singapore National Parks Board on water use of tropical trees
 - 2007 Aug. 19. Talk to Hanoi University of Agriculture on tree water use and on exchange opportunities with Utah State University

2006 October 10, *Urban horticulture and water policy in Utah and the Arid Intermountain West* keynote presentation in the morning session, "Water policy and

- practices for the plants of lifestyle horticulture”. Plant Water Workshop for South East Queensland.
- 2006 October 10, *Estimating water use of urban shade trees for water conservation in irrigated landscapes* keynote presentation in the afternoon session, “Topics in plant water relations research”. Plant Water Workshop for South East Queensland.
- 2006 August 25, *Urban Landscape Water Conservation in the Arid Interior West of the US* guest lecture year 3 level course in sustainable horticultural management at the University of Melbourne Burnley campus.
- 2006 August 23, *Urban Landscape Water Conservation in the Arid Interior West of the US: Learning to Live within Our Means* presentation to Faculty of Natural Resources, Monash University in Melbourne.
- 2006 May 9, *Thai University Faculty: Observations on Professional Development*, presentation to Roundtable Forum on Encouraging Professional Development in Thai Higher Education, organized by the Thai Commission on Higher Education and Thailand-US Educational Foundation.
- 2006 May 7 *Forest Types in the US*, to Faculty of Forestry students at their Summer Field Camp, Kasetsart University.
- 2006 April 28 *Tree Water Use*, to the Department of Horticulture, Ubon Ratchathani University.
- 2006 April 25 *Sustainable Ornamental Horticulture in the US*, to the Department of Horticulture, Kasetsart University.
- 2006 Feb. 24 *Urban Forestry in the US*, to the Faculty of Natural Resources, Prince of Songkla University;
- 2006 Feb 23 *Ornamental Horticulture in the US*, to the Faculty of Natural Resources, Prince of Songkla University;
- 2006 Feb 22 *The US Agricultural Experiment Station*, to the Faculty of Natural Resources, Prince of Songkla University
- 2006 Feb 17. *Sustainable Landscaping in the US and Thailand*, to an off-campus masters program in the Faculty of Architecture at KU;
- 2006 Feb 14. *Urban Forestry and Remote Sensing in the US*, guest lecture to an urban forestry class;
- 2006 Feb 10, *Nursery Production in the US*, to the Silviculture Department;
- 2005 Dec 22, *Urban Forestry in America*, to the international forestry program offered by the Faculty of Forestry (FORTROP);
- 2005 Dec. 20, *Utah to Thailand and Back*, an overview of USU and my research and teaching program, to the Silviculture Department;
- 2005 March 15-16, Talk to Soils for Salmon workshop on landscape water conservation for Washington State University and Oregon State University Cooperative Extension, Puyallup WA
- 2004 Feb. 19-20. Talk on water conservation in landscapes and landscape tree water use to Chicagoland Nursery and Landscape Association, Chicago Illinois
- 2004 October 26. Handling and Planting Techniques for environmental restoration using native and adapted plants for Colorado State University Cooperative Extension. Delta Colorado.
- 2003 October 16. Who’s Using all the Water? A Comparison of Business and Residential Landscape Water Use to Utah League of Cities and Towns Annual Meeting, Springdale, Utah.

3. Service

a. Utah State University

- Former USU president Kermit Hall's Environmental Task Force—chair of landscape subcommittee. Developed guidelines for integrating university physical plant and academic units towards planning for future landscapes that require less resource consumption.
- Search committees—chaired three faculty search committees, sat as member on two others.
- Member—departmental advisory committee 2002, campus arboretum committee ongoing, president's diversity committee.

b. Professional Society

- American Society of Horticultural Science
Chair, Climatology Working Group, 1990-92
Secretary, Western Region 1992-1997
- USDA Western Regional Coordinating Committee 58, Production and Use of Nursery Crops.
Hosted annual meeting, October 1995
- Associate Editor, Journal of Environmental Horticulture

c. Community

- Yearly donation of native plant material to Whittier Community Center for annual fundraising plant sale.
- Donation of plant material and labor to Smithfield community native plant garden.