

Curriculum Vita for C. Jerry Nelson

(August, 2011)

Name and Title:

C. Jerry Nelson, Curators' Professor Emeritus

University Address:

109 Curtis Hall, Plant Sciences Division
University of Missouri, Columbia, MO 65211 USA

<u>Education:</u>	<u>Location</u>	<u>Date</u>	<u>Degree</u>	<u>Field of Study</u>
Austin Junior College	Austin, Minn.	1959	A.A.	General Science
University of Minnesota	St. Paul, Minn.	1961	B. S.	Animal Husbandry
University of Minnesota	St. Paul, Minn.	1963	M. S.	Forage Production
University of Wisconsin	Madison, Wis.	1966	Ph.D.	Forage Physiology

<u>Academic Positions:</u>	<u>Organization</u>	<u>Dates</u>	<u>Remarks</u>
Research Associate	Cornell University	1966-1967	Research, Teaching
Assistant Professor	University of Missouri	1967-1971	Teaching, Research
Associate Professor	University of Missouri	1971-1975	Research, Teaching
Visiting Research Scientist	Welsh Plant Breeding Station, Aberystwyth	1973-1974	Sabbatic leave
Professor	University of Missouri	1975-1989	Research, teaching
Academic Guest	ETH, Zurich	1980-1981	Sabbatic leave
Curators' Distinguished Professor	University of Missouri	1989-2005	Research, teaching
Senior Advisor (Asian Affairs)	University of Missouri	2006-2009	International linkages
Curators' Professor Emeritus	University of Missouri	2009-present	Asia/Africa Food Systems

Honors/Awards/Activities:

1. Fellowship from NATO (NSF) for half salary during sabbatical leave, 1973-1974.
2. Fellow Award from American Society of Agronomy, 1978.
3. Merit Certificate from American Forage and Grassland Council, 1979.
4. Faculty Man of the Year Award by Missouri students in Alpha Zeta, 1979.
5. Outstanding Academic Advisor Award by students in College of Agriculture, 1979.
6. Fellowship from Swiss NSF for half salary for sabbatical leave, 1980-81.
7. Outstanding Undergraduate Teacher Award from Gamma Sigma Delta, Missouri Chapter, 1982.
8. Senior Faculty Research Award from Gamma Sigma Delta, Missouri Chapter, 1982.
9. Faculty-Alumni Award from University of Missouri Alumni Association, 1984.
10. Fellow Award from Crop Science Society of America, 1985.
11. Distinguished Faculty Award (campus-wide, one per year) from MU Alumni Association, 1987.
12. Fellow Award from Missouri Academy of Science, 1988.
13. Elected President of Crop Science Society of America, 1988.
14. Curators' Professor, distinguished professor designation from MU Board of Curators, 1989.
15. Crop Science Research Award from Crop Science Society of America, 1992.
16. Chair, Continuing Committee, International Crop Science Congresses, 1992-2000.
17. Honorary Scientist, Rural Development Administration (Korean "USDA"), 1992- present.
18. Elected President of American Society of Agronomy, 1996.
19. Researcher of the Year, University of Missouri College of Agriculture, 1996.
20. National Alfalfa Research Award, Certified Alfalfa Seed Council, 1996.
21. International Education Award, University of Missouri, 1997.
22. Board of Directors for CAST (Council of Agriculture and Science Technology), 1988-1991, 1998-2001.
23. National Advisory Committee for GLCI (Grazing Lands Conservation Initiative), 1994-2003.
24. Honorary Life Member, Certified Crop Advisor Program, 1997.
25. Board of Directors, the Thomas Jefferson Agricultural Institute, 2000-present, Chair 2005-present.
25. Medallion Award for distinguished service, American Forage and Grassland Council, 2000.
26. Elected President of International Crop Science Society, 2000-2004.
27. Distinguished Alumnus Award for 2004, Riverland Community College, Austin, MN.
28. Siehl Prize for Academic Leadership and Contributions to Agriculture, Siehl Foundation, MN, 2004
29. Agricultural Leader of the Year, Agricultural Leaders of Tomorrow organization in Missouri, 2004.
29. Commendation from Chonnam National University (Korea) for promoting cooperation with MU, 2005.
30. Outstanding Agronomy Faculty Award, Agronomy Club, University of Missouri, 2005.
31. Commendation from Suncheon National University (Korea) for facilitating cooperation with MU, 2005.
32. Agronomic Service Award from the American Society of Agronomy, 2006.
33. Outstanding Alumni Award from the American Association of Community Colleges, 2007.
34. Presidential Citation for Special Services from American Forage and Grassland Council, 2011.

Textbooks Authored:

1. Larson, K.L., W.J. Russell, and C.J. Nelson. 1971. Individualized Program Learning Units for Plant Science. University of Missouri Technical Education Service. 250 p.
2. Larson, K.L., W.J. Russell, and C.J. Nelson. 1975. Agricultural Plant Science. Kendall/Hunt Pub. Co. Dubuque, IA. 180 p.

Textbooks Edited:

1. Barnes, R.F, D.A. Miller, and C.J. Nelson (eds.). 1995. Forages: (Vol. I) An Introduction to Grassland Agriculture, 5th edition. Iowa State University Press, Ames, IA.
2. Barnes, R.F, D.A. Miller, and C.J. Nelson (eds.). 1995. Forages: (Vol. II) The Science of Grassland Agriculture, 5th edition. Iowa State University Press, Ames, IA.
3. Barnes, R.F, C.J. Nelson, M. Collins, and K.J. Moore (eds.). 2003. Forages: (Vol. I) An Introduction to Grassland Agriculture, 6th edition. Blackwell Press, Ames, IA. (Nelson co-authored 10 of 20 chapters)
4. Barnes, R.F, C.J. Nelson, K.J. Moore and M. Collins (eds.). 2006. Forages: (Vol. II) The Science of Grassland Agriculture, 6th edition. Blackwell Press, Ames, IA. (Nelson co-authored 2 of 46 chapters)
5. Nelson, C.J. (ed). 2011. Conservation Outcomes from Pastureland and Hayland Practices: Assessment, Recommendations and Knowledge Gaps. Allen Press. Lawrence KS. (Nelson co-authored 2 chapters).

Chapters in Technical Books (since 1994, all invited, about 30 in total career):

1. Nelson, C.J. 1994. Apparent respiration and plant productivity. p. 251-258. In Boote, K.J., J.M. Bennett, T.R. Sinclair, and G.M. Paulsen (eds.) Physiology and Determination of Crop Yield. Amer. Soc. Agron., Madison, WI.
2. Nelson, C.J. and L.E. Moser. 1994. Plant factors affecting forage quality. p. 115-154. In G.C.Fahey et al. (eds.) Forage quality, evaluation, and utilization. Amer. Soc. Agron. Madison, WI.
3. Nelson, C.J. 1996. Physiology and developmental morphology. p. 87-125. In L.E. Moser et al., (eds.) Cool-Season Forage Grasses. Amer. Soc. Agron., Madison, WI.
4. Nelson, C.J. 2000. Shoot morphological plasticity of grasses: leaf growth and tillering. p. 101-126. In G. Lemaire et al. (eds). Grassland Ecophysiology and Grazing Ecology, CAB International, Wallington, UK.
5. Schnyder, H., R. Schauffele, R. de Visser, and C.J. Nelson. 2000. An integrated view of C and N use in leaf growth zones of defoliated grasses. p. 41-60. In G. Lemaire et al. (eds) Grassland Ecophysiology and Grazing Ecology, CAB International, Wallington Oxon, UK.
6. Nelson, C.J. and others. 2003 and 2006. Twelve chapters in books 3 and 4 above.
7. Nelson, C.J. 2007. Sustainability of Agriculture: Issues, Observations and Outlook. p. 1-24. In M.S. Kang (ed.) Agriculture and Environmental Sustainability: Considerations for the Future. Haworth, Binghamton, NY.
8. Nelson, C.J. 2008. Grassland Agriculture, Vol I. p. 451-455. In G. Goreham (ed.) Encyclopedia of Rural America. Grey House Pub., Millerton, NY.

Recent Refereed Research Publications (more than 210 in total career):

- Nelson, C.J., R.E. Mattas, and J.H. Coutts. 1996. Seeding rate, plant density and persistence of alfalfa. Proc. Amer. Forage Grassl. Coun. 5:231-235.
- Skinner, R.H., C.J. Nelson, and J.H. Coutts. 1996. Tall fescue growth after paraquat application to elongating or mature leaves. Agron. J. 88:49-53.
- Nelson, C.J. 1997. Methods of analysis of quantitative data in crop research: An overview. p. 753-758. In V.L Chopra, R.B. Singh, and A. Varma (eds) Crop Productivity and Sustainability - Shaping the Future. Proc. 2nd International Crop Science Congress. Oxford Pub. Co. New Delhi. Invited.
- Nelson, C.J. 1997. Culture and science. Agron. J. 89:155-156. Invited Presidential Address.
- Nelson, C.J., J.A. Jennings, S-U Chon, and J.H. Coutts. 1997. Dealing with alfalfa autotoxicity. Proc. 25th Central Alfalfa Improvement Conference (LaCrosse, WI), p.13-25. Invited.
- Jennings, J.A. and C.J. Nelson. 1998. Influence of soil texture on alfalfa autotoxicity. Agron. J. 90:54-58.
- Nelson, C.J., M.H. Hall, and J.H. Coutts. 1998. Seeding rate effects on self-thinning of alfalfa. Proc. Am. Forage Grassl. Coun. 7:6-10.
- Seong, R.C., J.G. Kim, and C.J. Nelson. 1999. Dry matter accumulation and leaf mineral contents as affected by excessive soil water in soybean. Korean J. Crop Sci. 44:129-133.
- Nelson, C.J., and J.H. Coutts. 1999. Regulation and application of leaf growth rate in grasses. Am. Forage Grassl. Coun. Abstr. 8:55.
- Nelson, C.J. 1999. Managing nutrients across regions of the United States. J. Anim. Sci. 77:90-100. Invited.
- Chon, S.U., C.J. Nelson, and J.H. Coutts. 2000. Effects of light, growth media, and seedling orientation on bioassays of alfalfa autotoxicity. Agron. J. 92:715-720.
- Nelson, C.J. 2000. Grazing lands research and education assistance-Midwest region. Proc. Am. Forage Grassl. Coun. 9:275-279. Invited.
- Luscher, M., U. Hochstrasser, G. Vogel, R. Aeschbacher, V. Galati, C.J. Nelson, T. Boller, and A. Wiemken. 2000. Cloning and functional analysis of sucrose-sucrose 1-fructosyltransferase (1-SST) from tall fescue. Plant Physiol. 124:1217-1227.

- Kallenbach, R.L., C.J. Nelson, J.H. Coutts, and R.E. Mattas. 2000. Influence of cultivar, harvest frequency and autumn management on alfalfa yield and persistence. *Proc. Am. Forage Grassld. Coun.* 9:207-211.
- Nelson, C.J., M.H. Hall, R.L. Kallenbach, and J.H. Coutts. 2001. Effects of seeding rate on plant thinning and crown development of alfalfa. *Proc. Am. Forage Grassld. Coun.* 10:180-184.
- Chon, S-U, and C.J. Nelson. 2001. Effects of experimental procedures and conditions on bioassay sensitivity of alfalfa autotoxicity. *Commun. Soil Sci. Plant Anal.* 32:1607-1619.
- Rademacher, I.F, and C.J. Nelson. 2001. Nitrogen effects on leaf anatomy within leaf intercalary meristems of tall fescue leaf blades. *Ann. Bot.* 88:893-903.
- Nelson, C.J. 2001. Pride and place of scientific leadership: Summary and perspectives. p. 265-272. In W.A. Payne, D.R. Keeney, and S.C. Rao (eds) *Sustainability of agricultural systems in transition*. Amer. Soc. Agron, Madison, WI.
- MacAdam, J.W., and C.J. Nelson. 2002. Secondary cell wall deposition causes radial growth of fibre cells in the maturation zone of elongating tall fescue leaf blades. *Ann. Bot.* 89: 89-96.
- Jennings, J.A., and C.J. Nelson. 2002. Rotation interval and pesticide effects on establishment of alfalfa after alfalfa. *Agron. J.* 94:786-791.
- Jennings, J.A., and C.J. Nelson. 2002. Zone of autotoxic influence around established alfalfa plants. *Agron. J.* 94:1104-1111.
- Chon, S-U, C.J. Nelson, and J.H. Coutts. 2003. Factors affecting autotoxicity of alfalfa. *J. Chem. Ecol.* 29:2413-2424.
- Hall, M.H., C.J. Nelson, J.H. Coutts, and R.C. Stout. 2004. Effect of seeding rate on alfalfa stand longevity. *Agron. J.* 96:717-722.
- Chon, S.U., C.J. Nelson, and J.H. Coutts. 2004. Osmotic and autotoxic effects of leaf extracts on germination and seedling growth of alfalfa. *Agron. J.* 96:1673-1679.
- Xu, Q., S.S. Bughrara, C.J. Nelson, and J.H. Coutts. 2005. Mechanisms of seed dormancy in zoysia (*Zoysia japonica* Stued.). *Seed Sci. Tech.* 33:543-550.
- Nelson, C.J., and J.C. Burns. 2006. Fifty years of grassland science leading to change; a review. *Crop Sci.* 46:2204-2217.
- Chon, S.U., J.J. Jennings, and C.J. Nelson. 2007. Advances in understanding alfalfa (*Medicago sativa* L.) autotoxicity. *Allelopath. J.*
- Wang, J.P., S.S. Bughrara, and C.J. Nelson. 2008. Morpho-physiological responses of several fescue grasses to drought stress. *HortSci.*43:776-783.

Some Recent Technical Publications (more than 100 in total career):

- Nelson, C.J., R. Keingatti, and J. Coutts. 2000. Nitrogen alters mineral use for growth of tall fescue leaves. *Proceedings of 3rd International Crop Science Congress Abstr.* p. 35.
- Matitschka, G., and C.J. Nelson. 2000. Effects of temperature and radiation density on leaf and cell growth of leek and tall fescue. *Proceedings of 3rd International Crop Science Congress Abstr.* p. 90.
- Nelson, C.J. 2000. Mechanisms associated with alfalfa autotoxicity. *Amer. Soc. Agron. Abstr.* p. 91.
- Bottoms, R.M., C.J. Nelson, and J.H. Coutts. 2000. Growth and yield response of corn, soybean and tomato to colored mulch. *Amer. Soc. Agron. Abstr.* p. 155.
- Coutts, J.H., R.L. Kallenbach, and C.J. Nelson. 2001. Determining plant density of alfalfa: to dig or not to dig? *Amer. Soc. Agron. Abstr.*
- Bottoms, R.M., C.J. Nelson, J.H. Coutts, and T.D. Whitson. 2001. Grass-knapweed interference involves allelopathic factors associated with ecosystem mineral cycling. *Amer. Soc. Agron. Abstr.*
- Nelson, C.J., and J.H. Coutts. 2001. Vigor and survival of early and late emerging seedlings of alfalfa. *Amer. Soc. Agron. Abstr.*
- Bottoms, R.M., C.J. Nelson, T.D. Whitson, and J.H. Coutts. 2001. Factors causing allelopathy in Russian knapweed. *International Knapweed Symposium Proc., Coeur d'Alene, ID.* 1:100.
- Bottoms, R.M., C.J. Nelson, T.D. Whitson, and J.H. Coutts. 2002. Grass knapweed interference involves allelopathic factors associated with ecosystem mineral cycling. *Proc. Weed Sci. Soc. of Amer., Reno, NV.*
- Kallenbach, R.L., C.J. Nelson, W.C. Bailey, and J.H. Coutts. 2003. Influence of cultivar selection, insect management, and potassium fertilization on potato leafhopper tolerance of alfalfa. *Amer. Soc. Agron.*
- Hall, M.H., C.J. Nelson, and J.H. Coutts. 2004. Alfalfa seeding rate effects on stand longevity. *Amer. Soc. Agron.*
- Nelson, C.J. 2004. Microclimates within plant communities. *Amer. Soc. Agron. Abstr.* (invited).
- Nelson, C.J. 2005. Importance of *Medicago* species and economic consequences of their pests. *National Alfalfa Conference.* (invited).
- Nelson, C.J. 2005. Golden anniversary lecture, 50 years of Grassland Progress. *Crop Sci. Soc. Amer.* (invited).
- Nelson, C.J. 2006. Environmentally friendly agriculture: Global perspectives and local challenges. *Korea Society of Crop Science.* (invited)
- Nelson, C.J. 2008. International Crop Science and Meeting Future Needs. *Proc. 5th International Crop Science Congress, Jeju, Korea.* (invited)
- Nelson, C.J. 2008. Panel Report for African scientists: Seeds of growth. *Corp. Coun. on Africa, Chicago,* (invited)
- Nelson, C.J. 2009. Harvesting resources for meeting world food needs. *Lecture, Seoul Korea.* (invited)

International Experience in Science and Professional Leadership:

Nelson has extensive international experience, especially during the past 25 years, in research, graduate education, international relations and development efforts. Based on year-long sabbatical leaves in Wales (1973-1974) and Switzerland (1980-1981) extensive relationships and interactions were developed with scholars and leaders throughout the world, and more recently in East Asia. Since 1985, while maintaining strong research and teaching programs, activities increased at the international level, especially on international conferences and symposia, coordinating joint research projects, book writing, and serving in leadership capacities that integrate science and problem solving in developing countries. Extensive efforts have been dedicated to University of Missouri programs and other initiatives in developed and developing countries including research and technical visits of 2-3 weeks each to Germany (7 times), France (5 times), United Kingdom (3 times), Poland (2 times), Czechoslovakia, India (5 times), Kenya (5 times), Tunisia (2 times), Morocco, Brazil, Australia (2 times), New Zealand, Japan (2 times), South Korea (32 times), North Korea (4 times), Thailand (3 times), South Africa (2 times), Tanzania (1 time) and Vietnam (6 times). Currently, Nelson serves the Asian Affairs Center as liaison for international activities for the entire University of Missouri campus, including Agriculture.

In addition to being elected President of the Crop Science Society of America (1988) and the American Society of Agronomy (1996), Nelson was the key US and international leader in developing the successful series of International Crop Science Congresses that have been held every 4 years beginning in 1992. When the series of Congresses was developed into the International Crop Science Society in 2000, Nelson was elected the first President (2000–2004). During the past 5 years he has worked with the American Association for the Advancement of Science (AAAS) to develop science exchanges with developing countries, mainly North Korea.

Nelson has worked extensively with African agriculture for about 20 years on a program with the University of Missouri. The goals were institution building where he contributed expertise and mentoring of graduate students and consulted with governments on agricultural policies for food security and environmental conservation. He was involved in Morocco, South Africa and Tanzania with germplasm issues and technical advice on cropping systems and rotations. In Tunisia, he dealt with plant breeders, crop physiologists and soil scientists on developing cropping systems for dryland areas. On several visits Nelson worked in Kenya to develop an overall long-term project plan, coordinated a strategic plan for cereal crops and food supplies, developed the framework for a competitive grants program for Kenyan scientists in agriculture, and taught workshops on grant-writing and proposal assessment methods. All led to significant advancements in the approach to research and the outcomes from the research.

Most recently, Nelson continued to expand his international involvement focusing on world food issues with major contributions in East Asia (Vietnam, North Korea), South Asia (India) and Africa (South Africa, Tanzania). Scores of lectures have been delivered at universities, research institutes and to government officials. Three general themes have been advocated: World Food Issues, Agricultural Sustainability, and the Roles of Biotechnology.

Integrating Advances in Technology with Social/Cultural Issues:

Throughout his research and teaching career on crop sciences, Nelson has gained comprehensive expertise on rotations for erosion control and nutrient management; cover crops for off-season forage production and soil improvement, erosion control and weed control; green manures for nutrient management and improvement of soil quality; and bio-pest control through nutrient management, species selection, and grazing or harvest management. Not surprisingly, these principles apply to a wide range of cropping systems including intercropping, relay cropping and other strategies that are common in Asian and African agriculture, and in many of the developing countries.

Currently, Nelson is leading an effort for the USDA Natural Resource Conservation Service (NRCS) on a national assessment of environmental and conservation benefits that have accrued from US government programs that support these goals. The major literature search is underway to assess nutrient management, seeding strategies, grazing and cutting effects (making hay or silage) on the ecosystem services the public expects. This extensive report will be finished in the next 3 months and will be interfaced with a parallel reports assessing the role of cost-share programs. In both assessments there is major focus on soil quality, soil conservation, food production and environmental sustainability, all of which relate to a broad range of international challenges and potential solutions.

Throughout the international effort there is recurring emphasis on gender issues in developing countries and the increasing recognition of the major roles played by women. But this is still affected by limited appreciation of their roles, so cultures, social systems including education, and government policies need assessments along with new technologies for making significant changes. Thus, a theme throughout Nelson's effort is that technology advances can be helpful, but they need to be evaluated and accepted in a social and political context as the technology is moved into practice in crop and livestock production and sustainable land management. Too frequently, it is thought that technology alone can solve the problem, yet history has revealed again and again that technology only offers solutions; it is the public and governments that determine if that solution can be or will be used.