

NEIL C. HANSEN

Curriculum vitae

Associate Professor of Soil Science
Colorado State University
Department of Soil and Crop Sciences
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PROFESSIONAL GOALS

My professional goal is to understand how agricultural management practices affect the quality of soil and water resources and to develop management practices that promote sustainability. I will be actively involved in quality education and research teams that make clear contributions to society.

EDUCATION

Ph.D. - Soil Physics - Univ. of Minnesota, St. Paul, MN - Aug. 1998

Thesis Title: Transport of agricultural contaminants in overland flow: Studies at three scales.

M.S. - Agronomy - Brigham Young Univ., Provo, UT - Aug. 1994

Thesis Title: Phytosiderophore release by iron-deficient oat genotypes.

B.S. - Agronomy, Brigham Young Univ., Provo, UT – Aug. 1992

EXPERIENCE

Associate Professor: Soil Scientist and Cropping Systems Specialist, Dept. Soil and Crop Sciences, Colorado State University, Fort Collins, CO (2004-present).

Assistant Professor: Soil Scientist and Water Quality Specialist, Dept. of Soil, Water, and Climate, Univ. of Minnesota, West Central Research and Outreach Center, Morris, MN (1998-2004).

USDA National Needs Predoctoral Fellow: Soil management and water quality, Dept of Soil, Water, and Climate, Univ. of Minnesota, St. Paul, MN (1994-1998).

Graduate Research Assistant: Soil fertility and plant nutrition. Dept. of Agronomy and Horticulture, Brigham Young Univ., Provo, UT (1992-94).

Research Technician: Soil fertility and plant nutrition. Dept. of Agronomy and Horticulture, Brigham Young Univ., Provo, UT (1990-92).

PROFESSIONAL ORGANIZATIONS AND HONOR SOCIETIES

- American Society of Agronomy
- Soil Science Society of America
- Soil and Water Conservation Society
- Sigma Xi, Scientific Research Society
- Phi Kappa Phi Honor Society

RESEARCH

Current research investigates management of dryland agroecosystems including the evaluation of crop rotation, hydrologic balance, soil erosion, and soil carbon dynamics. Additional research evaluates the application of principles from dryland management to limited irrigation cropping systems. Other areas of research interest include managing agricultural phosphorus to protect water quality and iron nutrition of field crops.

TEACHING

- Crop and Soil Management I and II (SC420 and SC 421). Principles and practices for agricultural soil and crop management. SC 421 is a senior level capstone course with extensive use of case study methods.
- Contaminant Hydrology (Uof MN; ES 4216). This upper level undergraduate course addresses mechanisms of contaminant movement in the vadose zone and in surface runoff. Taught annually in the fall: 1999-2003.
- Vadose Zone Hydrology Laboratory (U of MN, ES 5232). Taught standard methods in soil physical analysis and instrumentation. Taught annually: 1995-1997.
- Agronomy and Soil Science Teaching Assistant (BYU). Teaching assistant for courses in soil fertility, introductory crop science, and introductory soil science. 1991-1994.

OUTREACH

I have developed an outreach program that is focused on agricultural management practices and soil conservation issues. Because this subject is important for a variety of stakeholders, I have developed programs for 1) agricultural producers, 2) agricultural professionals and agency staff, and 3) the general public. I also regularly participate in educational opportunities for K-12 students. Regardless of the audience, I am committed to providing high quality educational programs and presentations that introduce new research based information on a foundation of relevant background information. I strive to understand the audience and to provide information that will be applicable to their needs.

Example Outreach Programs

- Annual summer field days (topics: soil erosion, water capture, cropping systems)
- Annual winter crop and soils events (topics: managing soil organic matter, soil water balance)
- Phosphorus chemistry in soil and water.
- Manure in the soil and in the environment
- USDA-NRCS Irrigation Water Management workshop

PUBLICATIONS

Refereed Publications:

- A.Z.H. Ranaivoson, J.F. Moncrief, N.C. Hansen, and S.C. Gupta. 2005. Effect of fall tillage following soybeans on organic matter losses in snowmelt. *Soil and Tillage Research* 81:205-216.
- Hansen, N.C., V.D. Jolley, S.L. Naeve, and R.J. Goos. 2004. Iron Deficiency of Soybean in the North Central U.S. and Associated Soil Properties. *Soil Sci. and Plant Nutr.* 50:983-987.
- Jolley, V.D., N.C. Hansen, and A. K. Shiffler. 2004. Nutritional and Management Related Interactions with Iron-Deficiency Stress Response Mechanisms. *Soil Sci. and Plant. Nutr.* 50:973-981.
- Gessel, P.D., N.C. Hansen, J.F. Moncrief, and M.A. Schmitt. 2004. Application Rate Of Liquid Swine Manure: Effects On Runoff, Sediment And Phosphorus Transport. *J. Environ. Qual.* 33:1839-1844.
- Gessel, P.D., N.C. Hansen, S.M. Goyal, L.J. Johnston, and J. Webb. 2004. Persistence of zoonotic pathogens in soil treated with different rates of liquid hog manure. *Applied Soil Ecology* 25:237-243.
- Hansen, N.C., M.A. Schmitt, J.E. Anderson, and J.S. Strock. 2003. Iron Deficiency of Soybean in the Upper Midwest and Associated Soil Properties. *Agronomy J.* 95:1595-1601.
- Forcella, F., S. Poppe, N.C. Hansen, E. Hoover, W. Head, F. Propsom, and J. McKensie. 2003. Biological mulches for managing weeds in transplanted strawberry. *Weed Technology* 17:782-787.
- Hansen, N.C., T.C. Daniel, and A.N. Sharpley. 2002. Fate and Transport of Phosphorus in Agricultural Systems. *J. Soil and Water Conservation* 57:408-417. *-INVITED.-*
- Hansen, N.C., S.C. Gupta, J.F. Moncrief. 2001. Snowmelt Runoff, Sediment, and Phosphorus Losses Under Three Different Tillage Systems. *Soil and Tillage Res.* 57:93-100.
- Hansen, N.C., J.F. Moncrief, S.C. Gupta, P.D. Capel, and A.E. Olness. 2001. Herbicide banding and tillage system interactions on runoff losses of alachlor and cyanazine. *J. Environ. Qual.* 30: 2120-2126.
- Hansen, N.C., J.F. Moncrief, and S.C. Gupta. 2000. Herbicide banding and tillage system impacts on runoff, sediment, and phosphorus losses in runoff. *J. Environ. Qual.* 29:1555-1560.
- Balogh, S.J., M.L. Meyer, N.C. Hansen, J.F. Moncrief, and S.C. Gupta. 2000. Transport of mercury from a cultivated field during snowmelt. *J. Environ Qual.* 29:871.
- Hansen, N.C., V.D. Jolley, W.A. Berg, M.E. Hodges, and E.G. Krenzer. 1996. Phytosiderophore release related to susceptibility of wheat to iron deficiency. *Crop Sci.* 36: 1473-1476.
- Jolley, V.D., K.A. Cook, N.C. Hansen, and W.B. Stevens. 1996. Plant physiological responses for genotypic evaluation of iron efficiency in strategy I and strategy II plants - a review. *J. Plant Nutr.* 19: 1241-1255.
- Hansen, N.C., V.D. Jolley, and J.C. Brown. 1995. Clipping foliage differentially affects phytosiderophore release by two wheat cultivars. *Agron. J.* 87: 1060-1063.
- Hansen, N.C. and V.D. Jolley. 1995. Phytosiderophore release as a criterion for genotypic evaluation of iron efficiency in oat. *J. Plant Nutr.* 18: 455-465.
- Stevens, W.B., V.D. Jolley, and N.C. Hansen. 1994. Diurnal rhythmicity of root iron reduction in soybean as affected by various light regimes. *J. Plant Nutr.* 17: 2193-2202.

Stevens, W.B., V.D. Jolley, N.C. Hansen, and D.J. Fairbanks. 1993. Modified procedures for commercial adaptation of root iron-reducing capacity for use as a screening technique. *J. Plant Nutr.* 16: 2507-2519.

Book Chapter

N.C. Hansen, B.G. Hopkins, J.W. Ellsworth and V.D. Jolley. 2005. Iron Nutrition in Field Crops. *In: Iron Nutrition in Plants and Rhizospheric Microorganisms*, Editors Larry L. Barton, Javier Abadía. Springer 2005. pgs. 21-53.

Non-refereed Publications:

N.C. Hansen and G. Rehm. 2005. Crop and Water Quality Responses To P Fertilizer Management. *In: Proceedings of the Western Nutrient Management Conference. Vol. 6: 82-87. Salt Lake City, UT. (Invited)*

J.F. Moncrief, A.Z. Ranaivoson, N.C. Hansen, G.R. Sands, and E.C. Dorsey. 2004. Managing Surface Inlets: Rock Filter As An Alternative. Minnesota Department of Agriculture, St. Paul, MN.

N.C. Hansen, M.A. Schmitt, J.E. Anderson, J.S. Strock, and V.D. Jolley. 2004. Iron Deficiency of Soybean in the Upper Midwest and Associated Soil Properties. *Proceedings of the XII International Symposium on Iron Nutrition in Plants. Toyko, Japan. (Invited)*

V.D. Jolley, N.C. Hansen. 2004. Physiological Explanations for Field Observed Problems on Iron. *Proceedings of the XII International Symposium on Iron Nutrition in Plants. Toyko, Japan. (Invited)*

Hansen, N.C. and D. Fuchs. 2003. Dairy manure application methods and nutrient loss from alfalfa. *In: Greenbook 2003; Caring for the Land. pgs 65-67. Minnesota Department of Agriculture. St. Paul, MN.*

Hansen, N.C. 2002. Phosphorus and animal manures from a soil scientist perspective. *Proceedings of the 63rd Minnesota Nutrition Conference Symposium. University of Minnesota. (Invited)*

Hansen, N.C., and J.F. Moncrief. 2002. The phosphorus site index: A tool to reduce non-point source pollution. p.13-20. *In Proc. American Forage and Grassld. Council Symposium on Nutrient Management in Forage-Ruminant Systems. 15 July 2002. Bloomington, MN. (Invited)*

Moncrief, J.F. and N.C. Hansen. 2002. Managing Soil and Water for Crop Production and Meeting Water Quality Challenges. *Proceedings of the 1st Agricultural Drainage Field Day.*

Hansen, N.C., J.G. Moncrief, P.R. Bloom, D.J. Mulla, P. Bierman, and M. Mozafarri. 2002. A Phosphorus Index Developed For Water Quality Risk Assessment in Minnesota. *Proceedings of Minnesota Water 2002.*

Hansen, N.C. 2002. Land application of mortality compost to improve soil and water quality. *In: Greenbook 2002; Sustaining people, land, and communities. Pgs. 30-32. Minnesota Department of Agriculture. St. Paul, MN.*

Hansen, N.C., and K. Pazdernik. 2001. Iron chlorosis in soybean. *In: On-farm cropping trials, Northwest and West Central Minnesota. Pg. 17. University of Minnesota Extension. St. Paul, MN.*

Hansen, N.C. 2000. Soybean inoculation for reducing iron chlorosis. *In: On-farm cropping trials, Northwest and West Central Minnesota. Pg. 21 University of Minnesota Extension. St. Paul, MN.*

Hansen, N.C., J.F. Moncrief, and S.C. Gupta. 1999. Herbicide Banding and Tillage System Interactions on Sediment, and Phosphorus Losses in Runoff. *ISCO Mtgs.*

N. C. Hansen and G.W. Rehm. 1999. Phosphate Management for the Corn Soybean Rotation. In: North Central Extension-Industry Soil Fertility Conference Proceedings Vol 15. Pg 16-25. St. Louis, MO.

P. R. Bloom, Mulla, D., Cheng, H.H., Eash, N., Strock, J., Schmitt, M., Moncrief, J., Lewandowski, A., Chester-Jones, H., Allan, D., Hansen, N.C., Gollany, H.T., Zumwinkle, M. 1999. Generic Environmental Impact Statement on Animal Agriculture: A Summary of the Literature Related to Soils. Minnesota Environmental Quality Board. St. Paul, MN.

J. F. Moncrief, Ginting, D., Mozaffari, M., Russelle, M.P., Bloom, P.R., Richard, T.L., Goodrich, P.R., Chester-Jones, H., Clanton, C.J., Mulla, D.J., Schmitt, M.A., Randall, G.W., Strock, J.S., Eash, N.S., Hansen, N.C., Rosen, C.J., Schaeffer, C.C., DiCostanzo, A., Cheng, H.H. 1999. Generic Environmental Impact Statement on Animal Agriculture: A Summary of the Literature Related to Manure and Crop Nutrients. Minnesota Environmental Quality Board. St. Paul, MN.

Hansen, N.C., J.F. Moncrief, and S.C. Gupta. 1997. The effects of residue management and herbicide application methods on loss of agricultural contaminants in surface water. In: Field Research in Soil Science 1997. Minnesota agric. expt. stn. misc. pub. 91-1997.

Jolley, V.D., and N.C. Hansen. 1995. Grazing-induced iron-deficiency chlorosis in wheat genotypes relates to phytosiderophore release by roots. In: (Terry Tindall, ed.) Western Nutrient Management Conference Proceedings 1: 143-147.

Published Abstracts:

Ma, L., L. A. Sherrod, G. A. Peterson, N. Hansen, and L. R. Ahuja. 2006 (submitted). Soil Carbon Sequestration Under Long-term No-till and Under Various Crop Rotations and ET Demands in Eastern Colorado, USA. Proceedings of the International Soil Tillage Research Organization. Kiel, Germany.

Hansen, N.C., Ward, S. Khosla, R. and Fenwick, J. 2005. A National Look at Undergraduate Programs in Agronomy and Soil Science. Agronomy Abstracts. **(Invited)**

Hansen, N.C. 2004. Agricultural Nutrient Management Issues and Solutions in the U.S. Confronting Water Scarcity Conference, Lethbridge, Alberta, Canada. **(Invited)**

N.C. Hansen, M.A. Schmitt, J.E. Anderson, J.S. Strock, and V.D. Jolley. 2004. Iron Deficiency of Soybean in the Upper Midwest and Associated Soil Properties. Agronomy Abstracts.

V.D. Jolley, N.C. Hansen. 2004. Physiological Explanations for Field Observed Problems on Iron. Agronomy Abstracts.

S. Y. Chen, J. E. Kurle, S. R. Stetina, D. R. Miller, and N. C. Hansen. 2003. Soil Variables Associated with Iron-deficiency Chlorosis in Minnesota Soybean Fields. Phytopathology 93:S16.

N.C. Hansen, A.S. Birr, P. Bierman, J.F. Moncrief, P. Bloom, and D.J. Mulla. 2002. Snowmelt runoff as a transport factor in a phosphorus site index. Agronomy Abstracts.

F. Majs, N.C. Hansen, and P. P. Russelle. 2002. Leaching losses of nitrogen from stockpiled dairy manure. Agronomy Abstracts.

M.A. Schmitt, J.S. Strock, N.C. Hansen, G.W. Randall, and A.M. Cecchi. 2002. Comparison of manure and fertilizer placement on corn and soybean yields and soil test P. Agronomy Abstracts.

- A.S. Birr, P. Bierman, D.J. Mulla, N.C. Hansen, P. Abloom, and J.F. Moncrief. 2002. Comparison of matrix and pathway versions of the phosphorus site index. *Agronomy Abstracts*.
- N.C. Hansen, P.D. Gessel, and G.W. Rehm. 2001. Phosphorus fertilizer management and runoff losses in a corn-soybean rotation. *Agronomy Abstracts*.
- M. Mozaffari, N.C. Hansen, J.F. Moncrief, D.J. Mulla, P. Bloom, A.D. McElhone. 2001. Phosphorus runoff from Minnesota agricultural soils. *Agronomy Abstracts*.
- M. Mozaffari, N.C. Hansen, J.F. Moncrief, D.J. Mulla, P. Bloom, A.D. McElhone. 2001. P status of Minnesota agricultural soils: implications for Minnesota P index development. *Agronomy Abstracts*.
- T.C. Daniel, N.C. Hansen, A.N. Sharpley, and J. Lemunyon. 2001. Fate and transport of phosphorus in agricultural systems. *Agronomy Abstracts*.
- M.A. Schmitt, N.C. Hansen, J.S. Strock, J.E. Anderson. 2001. Soil and plant characteristics of 60 soybean fields surveyed for chlorosis. *Agronomy Abstracts*.
- N.C. Hansen. 2000. Iron Deficiency Chlorosis in Soybean. 2000. Minnesota Crop Pest Management Short course. Proceedings of a Conference for professional agriculturalists. November 20-21, 2000. University of Minnesota Extension. St. Paul, MN.
- N.C. Hansen and P.D. Gessel. 2000. Runoff and Erosion Before and After Post-Emergence Herbicide Application. *Agronomy Abstracts*.
- P.D. Gessel, N.C. Hansen, J.F. Moncrief. 2000. The impact of phosphorus based manure application on water quality and soil properties. *Agronomy Abstracts*.
- J.F. Moncrief, N.C. Hansen, and S.C. Gupta. 2000. Effect of previous crop (alfalfa and soybeans) on runoff losses of pollutants. International Conference on Diffuse Pollution, Milwaukee, Wisconsin. International Water Association.
- John F. Moncrief, Neil C. Hansen, and Satish C. Gupta. Accelerated Adoption of Environmentally Sound Farming Systems Using A Paired Watershed Technique. Minnesota Water 2000. Minneapolis, Minnesota. April 25-26, 2000. University of Minnesota Water Resources Center.
- D. Johnson, T. VanDerPol, W. Head, A. Arner, H. Chester-Jones, G. Cuomo, N. Hansen, M. Reese, M. Rudstrom, W. Wright. Sustainable Livestock Systems. 2000. MISA Symposium. St. Paul, MN
- John F. Moncrief, Neil C. Hansen, and Satish C. Gupta. Accelerated Adoption of Environmentally Sound Farming Systems Using A Paired Watershed Technique. Minnesota Water 2000. Minneapolis, Minnesota. April 25-26, 2000. University of Minnesota Water Resources Center.
- Hansen, N.C., Gupta, S.C., and J.F. Moncrief. 1998. Chemical transport of a sorbing dye tracer in overland flow. *Agronomy Abstracts*.
- Hansen, N.C., Gupta, S.C., and J.F. Moncrief. 1997. Surface transport of alachlor and cyanazine after broadcast or band application on three tillage systems. *Agronomy Abstracts*, p. 38.
- Hansen, N.C., Gupta, S.C., and J.F. Moncrief. 1996. Tillage effects on quantity and quality of snowmelt induced runoff. *Agronomy Abstracts*, p. 28.

Hansen, N.C. and V.D. Jolley. 1995. Phytosiderophore release by clipped wheat explains field observations of iron-deficiency chlorosis when grazed. International Conference on BioIron--Eighth International Symposium of Iron Nutrition and Interactions in Plants, p. 69.

Jolley, V.D., and N.C. Hansen. 1995. Using phytosiderophore release for the genotypic evaluation of iron efficiency in oat and wheat. International Conference on BioIron--Eighth International Symposium of Iron Nutrition and Interactions in Plants, p. 164.

Hansen, N.C., and V.D. Jolley. 1994. Phytosiderophore release by defoliated or non-defoliated wheat. Agronomy Abstracts, p. 303.

Hansen, N.C., and V.D. Jolley. 1993. Differences in phytosiderophore release among 14 varieties of oat. Agronomy Abstracts, p. 273.

Hansen, N.C., W.B. Stevens, and V.D. Jolley. 1992. Ferric iron (Fe^{3+}) reduction by roots of Fe-deficient soybean varies with time of day. Agronomy Abstracts, p. 279.

Stevens, W.B., V.D. Jolley, N.C. Hansen, D.J. Fairbanks, and K.I. Harman. 1992. Adaptation of a laboratory technique for measuring root iron-reducing capacity for use as an iron-efficiency screening technique. Agronomy Abstracts, p. 292.

Hopkins, B.G., V.D. Jolley, and N.C. Hansen. 1991. Phytosiderophore mediated iron uptake in soybean. Agronomy Abstracts, p. 290.