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Director's report of research in Kansas 2009

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DIRECTOR'S REPORT OF RESEARCH IN KANSAS 2009

JULY 1, 2008 TO JUNE 30, 2009



KANSAS AGRICULTURAL
EXPERIMENT STATION

Letter of Transmittal

Office of the Director

To the Honorable Mark Parkinson, Governor of Kansas

It is my pleasure to transmit herewith the report of the Agricultural Experiment Station of the Kansas State University of Agriculture and Applied Science for the fiscal year ending June 30, 2009. This report contains the title, author, and publication information for manuscripts published by station scientists. The report was published only in electronic format.

Gary Pierzynski
Interim Director, K-State Research and Extension
and Interim Dean, College of Agriculture

A Message from the Director

We are pleased to provide this 2009 Director's Report of Research in Kansas. The report is intended to inform you about our research programs under way and some of our accomplishments. K-State Research and Extension is dedicated to a safe and sustainable food and fiber system and to strong, healthy communities, families, and youth through integrated research, analysis, and education.

This report is produced and distributed in electronic format only. An annual report distributed via the Internet provides information in a more timely fashion, eliminates printing costs, and makes the report accessible to a broader audience.

The 2009 Director's Report of Research in Kansas provides a list of journal articles, station publications, and other published manuscripts from scientists in our departments, centers, fields, and associated programs.

The Agricultural Experiment Station is the research component of [K-State Research and Extension](#). Our research programs provide the latest information used by our extension programs to address issues facing Kansas citizens.

Gary Pierzynski
Interim Director, K-State Research and Extension
and Interim Dean, College of Agriculture



Contents

Research Components of the Kansas Agricultural Experiment Station.....1	Clinical Sciences.....22
Station Publications3	Communications23
Publications of Station Scientists.....4	Diagnostic Medicine/Pathobiology.....23
Administration4	Entomology.....27
Agricultural Economics4	Grain Science and Industry29
Agronomy4	Horticulture, Forestry, and Recreation Resources32
Anatomy and Physiology10	Hospitality Management and Dietetics34
Animal Sciences and Industry.....11	Human Nutrition34
Apparel, Textiles, and Interior Design.....16	Plant Pathology35
Biochemistry16	Statistics40
Biological and Agricultural Engineering18	Agricultural Research Center–Hays.....41
Biology.....19	Northwest Research-Extension Center44
Chemical Engineering.....21	Southeast Agricultural Research Center45
Civil Engineering.....22	Southwest Research-Extension Center46

Search Tips

To find publications by a particular author, type the surname in the “find” search box in the Acrobat toolbar in this document. Use “Find Next” until all relevant publications are found.

To minimize irrelevant items when searching for common names such as Smith or Johnson, go to the page for the author’s unit (or use the unit bookmark) to start your search.

Research Components of the Kansas Agricultural Experiment Station*

(See map, p. 2)

Academic Departments

College of Agriculture

Agricultural Economics
Agronomy
Animal Sciences and Industry
Communications
Entomology
Grain Science and Industry
Horticulture, Forestry and Recreation Resources
Plant Pathology

College of Arts and Sciences

Biochemistry
Biology
Statistics

College of Engineering

Biological and Agricultural Engineering
Chemical Engineering

College of Human Ecology

Apparel, Textiles, and Interior Design
Hospitality Management and Dietetics
Human Nutrition

College of Veterinary Medicine

Anatomy and Physiology
Clinical Sciences
Diagnostic Medicine/Pathobiology
Veterinary Diagnostic Lab

Research Centers

Agricultural Research Center–Hays
Horticulture and Forestry Research-Extension Center
John C. Pair Horticultural Center
Northwest Research-Extension Center
Southeast Agricultural Research Center
Southwest Research-Extension Center

Experiment Fields

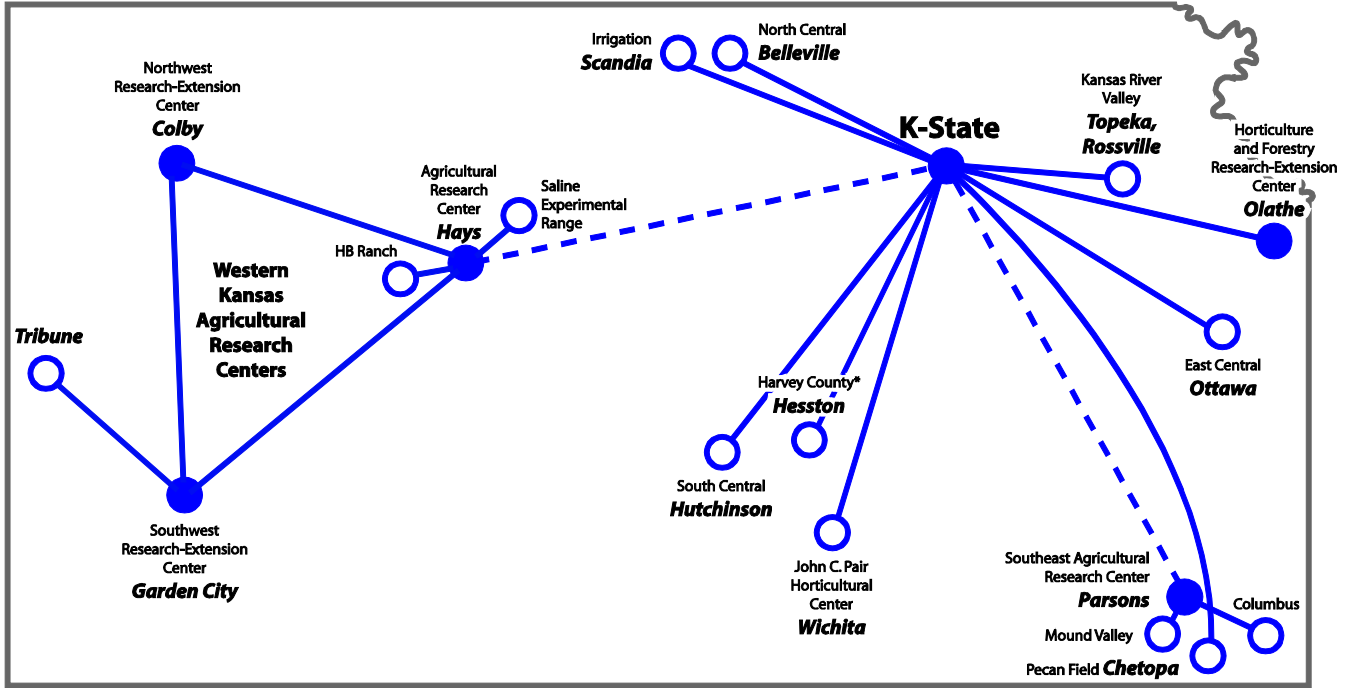
East Central - Ottawa
Harvey County – Hesston (Closed in Dec. 2009)
Irrigation - Scandia
Kansas River Valley - Rossville, Silver Lake
North Central - Belleville
Pecan Field - Chetopa
South Central - Hutchinson

Associated Programs

Bioprocessing and Industrial Value-Added Program
Center for Animal Identification
Center for Biobased Products by Design
Center for Sustainable Energy
Food Science Institute
Great Plains Diagnostic Network
Great Plains Sorghum Improvement and Utilization Center
Kansas Ag and Rural Leadership
Kansas Center for Agricultural Resources and the Environment
Kansas Center for Sustainable Ag and Alternative Crops
Kansas Cooperative Development Center
Kansas Water Resources Institute
Konza Prairie Biological Station
International Grains Program
International Meat and Livestock Program
Plant Biotechnology Center
Weather Data Library
Wheat Genetic and Genomic Resources Center

* List includes units having faculty with KAES appointments in fiscal year 2009. For a full list of departments and programs of the Kansas State University Agricultural Experiment Station and Cooperative Extension Service and for additional information on K-State Research and Extension, see www.ksre.ksu.edu, and click on “About Us” in the sidebar.

Kansas State University Agricultural Research Locations



Current research centers and experiment fields.
 *Harvey County Experiment Field closed in December 2009.

Station Publications

Reports of Progress

- SRP 999 2008 Kansas Performance Tests with Winter Wheat Varieties
- SRP 1000 2008 Kansas Performance Tests with Corn Hybrids
- SRP 1001 Swine Day 2008 (electronic only)
- SRP 1002 Dairy Research 2008
- SRP 1003 2008 Kansas Performance Tests with Soybean Varieties
- SRP 1004 2008 Kansas Performance Tests with Grain Sorghum Hybrids
- SRP 1006 2008 Kansas Performance Tests with Sunflower Hybrids
- SRP 1007 2009 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland
- SRP 1008 2008 Kansas Performance Tests with Cotton Varieties
- SRP 1009 2008 National Winter Canola Variety Trial
- SRP 1010 Beef Cattle Research 2009 (electronic only)
- SRP 1011 Agronomy Field Research 2008 (electronic only)
- SRP 1012 Kansas Fertilizer Research 2008 (electronic only)
- SRP 1013 2009 Agricultural Research, Southeast Agricultural Research Center
- SRP 1014 Field Day 2009, Southwest Research-Extension Center
- SRP 1016 Roundup 2009, Agricultural Research Center-Hays
- SRP 1017 Agronomy Field Research 2009 (electronic only)

Special Publications

- DRR08 Director's report of research in Kansas 2008 (electronic only)

Suffix Letters for Contribution Numbers

- A Proceedings of meeting or symposium
- B Book or book chapter
- C Computer program
- D Department report
- J Journal manuscript
- S Station publication (report of progress, keeping up with research, special publication, or bulletin)
- T Trade publication

Categories are based on information received before manuscripts are published. Type of publication sometimes changes later.

Station publications are available on the World Wide Web at: www.ksre.ksu.edu/library

Department reports are available only from the appropriate department office. Copies of journal articles or other external publications must be obtained from authors, journals, or a library. Some citations include a digital object identifier (doi) for use in retrieving manuscripts online. To locate an object using its doi, visit <http://dx.doi.org/>.

Publications of Station Scientists (by unit and contribution number)

Note: Manuscripts are cross listed under all relevant units according to authors' affiliation and appointment (i.e., Kansas Agricultural Experiment Station tenths).

Administration

DRR08 Director's report of research in Kansas 2008
May 2009, 209 pp. (electronic only)
www.ksre.ksu.edu/library/misc2/DirRept08.pdf

Agricultural Economics

07-295-J Grain sorghum and corn comparisons:
Yield, economic, and environmental
responses
S.A. Staggenborg, K.C. Dhuyvetter, W.B.
Gordon
Agronomy Journal, 100:1600-1604, 2008

08-143-J Soybean yield and yield components
response to plant density in narrow row
systems
M. Epler, S. Staggenborg
Crop Management, 2008
doi:10.1094/CM-2008-0925-01-RS

08-228-J Economics of reduced-till, no-till and
opportunity cropping in western Kansas
R.O. Burton, Jr., R.P. Smith, A.J. Schlegel
Journal of the American Society of Farm
Managers and Rural Appraisers, 72:164-
176, 2009

09-064-D Staff, programs, and publications in
agricultural economics, Kansas State
University 2007
D.L. Foster
Agricultural Economics Department Staff
paper no. 09-01, 2008, 36 pp.

09-137-D Irrigated crop-share leasing arrangements in
Kansas
J. Schlegel, L.J. Tsoodle
Agricultural Economics Department Staff
paper no. 09-02, 2008, 18 pp.

09-143-J The procompetitive effect of demand-
enhancing check-off programs
J.M. Crespi, S. Marette
American Journal of Agricultural
Economics, 91:389-401, 2009

09-359-D Economic impacts of selected water
conservation policies in the Ogallala Aquifer
S. Amosson, L. Almas, B. Golden, B.
Guerrero, J. Johnson, R. Taylor, E. Wheeler-
Cook
Agricultural Economics Department Staff
paper no. 09-04, 2009, 51 pp.

09-364-D Staff, programs, and publications in
agricultural economics, Kansas State
University 2008
J. Maberry
Agricultural Economics Department Staff
paper no. 09-03, 2009, 45 pp.

Publications without contribution numbers

A stochastic model to compare breeding
system costs for synchronization of estrus
and artificial insemination to natural service
S.K. Johnson, R.D. Jones
The Professional Animal Scientist, 24:588-
595, 2008

Consumer responses to new food quality
information: Are some consumers more
sensitive than others?
Z. Gao, T.C. Schroeder
Agricultural Economics, 40:339-346, 2009

Probabilistic models of yield, price, and
revenue risks for fed cattle production
E. Belasco, M. Taylor, B.K. Goodwin, T.C.
Schroeder
Journal of Agricultural and Applied
Economics, 41:91-105, 2009

Valuing fed cattle using objective tenderness
measures
J.M. Riley, T.C. Schroeder, T. Wheeler, S.
Shackelford, M. Koohmaraie
Journal of Agricultural and Applied
Economics, 41:163-175, 2009

Agronomy

04-099-J Starter nitrogen fertilizer management for
continuous no-till corn production
B.J. Niehues, R.E. Lamond, C.B. Godsey,
C.J. Olsen
Agronomy Journal, 96:1412-1418, 2004

- 04-111-J Comparison of genotype and cultural practices to control iron deficiency chlorosis in soybean
J.E. Lingenfelter, W.T. Schapaugh, J.P. Schmidt, J.J. Higgins
Communications in Soil Science and Plant Analysis, 36:1047-1062, 2005
- 04-156-J Comparison of the Weibull model with measured wind speed distributions for stochastic wind generation
S.J. van Donk, L.E. Wagner, E.L. Skidmore, J. Tatarko
Transactions of the ASAE, 48(2):503-510, 2005
- 04-189-J On the construction and calibration of dual-probe heat capacity sensors
J.M. Ham, E.J. Benson
Soil Science Society of America Journal, 68:1185-1190, 2004
- 04-211-J Carbon and nitrogen mineralization as affected by drying and wetting cycles
M.M. Mikha, C.W. Rice, G.A. Milliken
Soil Biology & Biochemistry, 37:339-347, 2005
- 04-256-J Carbon dynamics in tallgrass prairie and wheat ecosystems
R. Kocyigit, C.W. Rice
Turkish Journal of Agriculture and Forestry, 28:141-153, 2004
- 04-262-J Lagoon-biogas emissions and carbon balance estimates of a swine production facility
T.M. DeSutter, J.M. Ham
Journal of Environmental Quality, 34:198-206, 2005
- 04-332-B Carbon cycle in soils: Dynamics and management
C.W. Rice
In: Encyclopedia of soils in the environment, D. Hillel (Ed.). Oxford, UK: Elsevier, pp. 164-169, 2005
- 04-382-J A field-based assessment tool for phosphorus losses in runoff in Kansas
O. Sonmez, G.M. Pierzynski, L. Frees, B. Davis, D. Leikam, D.S. Sweeney, K.A. Janssen
Journal of Soil and Water Conservation, 64:212-222, 2009
- 05-019-J Partitioning of nitrogen over five growing seasons in tallgrass prairie
C.J. Dell, M. A. Williams, C.W. Rice
Ecology, 86:1280-1287, 2005
- 05-163-J Corn yield response to nitrogen rate and timing in sandy irrigated soils
R.J. Gehl, J.P. Schmidt, L.D. Maddux, W.B. Gordon
Agronomy Journal, 97:1230-1238, 2005
- 05-327-J Emerging technologies for *in situ* measurement of soil carbon
R.J. Gehl, C.W. Rice
Climate Change, 80:43-54, 2007
- 06-083-J Post-harvest soil nitrate in irrigated corn: Variability among eight field sites and multiple nitrogen rates
R.J. Gehl, J.P. Schmidt, C.B. Godsey, L.D. Maddux, W.B. Gordon
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- 06-112-J Phosphorus source effects on soil organic phosphorus: A ³¹P NMR study
M. Shafqat, G.M. Pierzynski, K. Xia
Communications in Soil Science and Plant Analysis, 40: 1722-1746, 2009
- 06-141-J Greenhouse gas mitigation in agriculture
P. Smith, D. Martino, Z. Cai, D. Gwary, H. Janzen, P. Kumar, B. McCarl, F. O'Mara, C. Rice, B. Scholes, O. Sirotenko, M. Howden, T. McAllister, S. Ogle, G. Pan, V. Romanenkov, U. Schneider, S. Towprayoon, M. Wattenbach, J. Smith
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- 06-222-J Policy and technological constraints to implementation of greenhouse gas mitigation options in agriculture
P. Smith, D. Martino, Z. Cai, D. Gwary, H. Janzen, P. Kumar, B. McCarl, F. O'Mara, C. Rice, B. Scholes, O. Sirotenko, M. Howden, T. McAllister, S. Ogle, Pan, V. Romanenkov, U. Schneider, S. Towprayoon.
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N.O. Nelson, J.E. Parsons
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- 06-287-J Guar tolerance to postemergence herbicides
B.L.S. Olson, J.W. Sij, T.A. Baughman
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- 06-336-J Soil biological properties following
additions of bmr mutant grain sorghum
P.M. White, C.W. Rice, J.A. Baldock, M.R.
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Soil Biology & Biochemistry, 39:1518-
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a real-time sensor
S.A. Staggenborg, M. Carignano, L. Haag
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- 07-085-J Tillage effects on microbial and carbon
dynamics during plant residue
decomposition
P.M. White, C.W. Rice
Soil Science Society of America Journal,
73(1):138-145, 2009
- 07-096-J Efficacy of sulfonylurea herbicides when
tank mixed with mesotrione
C.L. Schuster, K. Al-Khatib, J.A. Dille
Weed Technology, 22:222-230, 2008
- 07-112-J Inheritance of resistance of common
waterhemp (*Amaranthus rudis*) to
protoporphyrinogen oxidase-inhibiting
herbicide
D.E. Shoup, K. Al-Khatib, P.A. Kulakow
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the Great Plains
G.M. Paulsen, J.P. Shroyer
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number of background markers for
relationship estimation in association
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J. Yu, Z. Zhang, C. Zhu, D.A. Tabanao, G.
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Todhunter, E.S. Buckler
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E.L. Skidmore, C. Liao, S.J. van Donk
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M. Carignano, J.P. Shroyer, S.A.
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stomatal resistance under microgravity
M.B. Kirkham
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- 07-295-J Grain sorghum and corn comparisons:
Yield, economic, and environmental
responses
S.A. Staggenborg, K.C. Dhuyvetter, W.B.
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lines using synchrotron infrared
microspectroscopy
E.S. Bonwell, T.L. Fisher, A.K. Fritz, D.
Wetzel
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combined in-field crop practices using the
Soil and Water Assessment Tool
D. Maski, K.R. Mankin, K.A. Janssen, P.
Tuppad, G.M. Pierzynski
Journal of Soil and Water Conservation,
63(4):193-203, 2008

- 08-073-J Efficacy of preemergence application of S-metolachlor plus fomesafen or metribuzin as an element in the control of common waterhemp (*Amaranthus rudis* Sauer) in soybeans
M.G. Duff, K. Al-Khatib, D.E. Peterson
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- 08-074-J Relative competitiveness of protoporphyrinogen oxidase-resistant common waterhemp (*Amaranthus rudis*)
M.G. Duff, K. Al-Khatib, D.E. Peterson
Weed Science, 57:169-174, 2009
- 08-083-J Soil temperature and planting depth effects on tef emergence
S. Evert, S. Staggenborg, B.L. Olson
Journal of Agronomy and Crop Science, 195:232-236, 2009
- 08-143-J Soybean yield and yield components response to plant density in narrow row systems
M. Epler, S. Staggenborg
Crop Management, 2008
doi:10.1094/CM-2008-0925-01-RS
- 08-167-B Linkage disequilibrium and association mapping in the Triticeae
M.E. Sorrells, J. Yu
In: Genetics and genomics of the Triticeae, Volume 7, C. Feuillet, G.J. Muehlbauer (Eds.). New York, NY: Springer, pp. 655-684, 2009
- 08-168-J Differential response of grain sorghum hybrids to foliar-applied mesotrione
M.J.M. Abit, K. Al-Khatib, D.L. Regehr, M.R. Tuinstra, M.M. Claassen, P.W. Greier, P.W. Stahlman, B.W. Gordon, R.S. Currie
Weed Technology, 23:28-33, 2009
- 08-196-J Impact of nighttime temperature on physiology and growth of spring wheat
P.V.V. Prasad, S.R. Pisipati, Z. Ristic, U. Bukovnik, A.K. Fritz
Crop Science, 48:2372-2380, 2008
- 08-213-J Sensitivity of grain sorghum to high temperature stress during reproductive development
P.V.V. Prasad, S.R. Pisipati, R.N. Mutava, M.R. Tuinstra
Crop Science, 48:1911-1917, 2008
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P.W. Geier, P.W. Stahlman, D.L. Regehr, B.L. Olson
Weed Technology, 23:197-201, 2009
- 08-219-J Protection of soil organic C and N in temperate and tropical soils: Effect of native and agroecosystems
K.P. Fabrizzi, C.W. Rice, T.J.C. Amado, J. Fiorin, P. Barbagelata, R. Melchiori
Biogeochemistry, 92:129-143, 2009
- 08-237-J Source specific fecal bacteria modeling using source and water assessment tool model
P.B. Parajuli, K.R. Mankin, P.L. Barnes
Bioresource Technology, 100:953-963, 2009
- 08-249-J Comparison of AnnAGNPS and SWAT model simulation results in USDA-CEAP agricultural watersheds in south-central Kansas
P.B. Parajuli, N.O. Nelson, L.D. Frees, K.R. Mankin
Hydrological Processes, 23:748-763, 2009
- 08-253-J Surface boundary layer of cattle feedlots: Implications for air emissions measurement
K.A. Baum, J.M. Ham, N.A. Brunsell, P.I. Coyne
Agricultural and Forest Meteorology, 148:1882-1893, 2008
- 08-265-J Fertilizer management for short-season corn grown in reduced, strip-till, and no-till systems on claypan soil
D.W. Sweeney, G.L. Kilgore, K.W. Kelley
Crop Management, 2008
doi:10.1094/CM-2008-072J-01-RS
- 08-278-B Impact of drought and heat stress on physiological, growth and yield processes
P.V.V. Prasad, S.A. Staggenborg, Z. Ristic
In: Modeling water stress effects on plant growth processes, L.H. Ahuja and S.A. Saseendran (Eds.). Madison, WI: ASA – CSSA. Advances in Agricultural Systems Modeling, pp. 301-355, 2009
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P.B. Parajuli, K.R. Mankin, P.L. Barnes
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K.W. Kelley, D.W. Sweeney
Crop Management, 2008
doi:10.1094/CM-2008-1114-01-RS
- 08-301-J Soil aggregation and carbon sequestration are tightly correlated with the abundance of arbuscular mycorrhizal fungi: Results from long-term field experiments
G.W.T. Wilson, C.W. Rice, M.C. Rillig, A. Springer, D.C. Harnett
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M.R. Tuinstra, S. Soumana, K. Al-Khatib, I. Kapran, A. Toure, A. van Ast, L. Bastiaans, N.W. Ochanda, I. Salami, M. Kayentao, S. Dembele
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R.A. Boydston, K. Al-Khatib
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R.A. Ogutu, K.A. Williams, G.M. Pierzynski
HortScience, 44(2):431-437, 2009
- 08-396-J Assessing intellectual development of horticulture undergraduates using the Perry scheme and learning environment preferences instrument
C.C. Lavis, K.A. Williams, S.J. Thein
NACTA Journal, 52(4):25-31, 2008
- 08-402-J Adaptation of a speciation sampling cartridge for measuring ammonia flux from cattle feedlots using relaxed eddy accumulation
K.A. Baum, J.M. Ham
Atmospheric Environment, 45:1753-1759, 2009
- 09-006-S 2008 Kansas Performance Tests with Winter Wheat Varieties
Multiple authors.
Coordinating author: J. Lingenfelter
KS Agric. Exp. Stn. Report of Prog. 999, July 2008
- 09-007-J Seed composition, seedling emergence and early seedling vigour of red kidney bean seed produced at elevated temperature and carbon dioxide
J.M.G. Thomas, P.V.V. Prasad, K.J. Boote, L.H. Allen, Jr.
Journal of Agronomy and Crop Science, 195:148-156, 2009
- 09-030-J Discovery and mapping single feature polymorphisms in wheat using Affymetrix arrays
A.N. Bernardo, P.J. Bradbury, H-X. Ma, S-W Hu, R.L. Bowden, E.S. Buckler, G-H. Bai
BCM Genomics, 2009
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- 09-033-J Lesion mimic associates with adult plant resistance to leaf rust infection in wheat
T. Li, G. Bai
Molecular Plant-Microbe Interactions, 119:13-21, 2009
- 09-043-J Influence of fungicide and sowing density on the growth and yield of two groundnut cultivars
J.B. Naab, K.J. Boote, P.V.V. Prasad, S.S. Seini, J.W. Jones
Journal of Agricultural Science, 147:179-191, 2009
- 09-051-J Conversion of grassland to coniferous woodland has limited effects on soil nitrogen cycle processes
D.C. McKinley, C.W. Rice, J.M. Blair
Soil Biology & Biochemistry, 40:2627-2633, 2008
- 09-093-J Heat tolerance and expression of protein synthesis elongation factors, EF-Tu and EF-1 α , in spring wheat
U. Bukovnik, J. Fu, M. Bennett, P.V.V. Prasad, Z. Ristic
Functional Plant Biology, 36:234-241, 2009
- 09-098-J Glyphosate weed control enhancement with ammonium sulfate and commercial water conditioning agents
D.E. Peterson, C.R. Thompson
Journal of ASTM International, 6(5), 2009
doi:10.1520/JAI102147
- 09-107-S 2008 Kansas Performance Tests with Corn Hybrids
Multiple authors.
Coordinating author: J. Lingenfelter
KS Agric. Exp. Stn. Report of Prog. 1000, November 2008

- 09-108-S 2008 Kansas Performance Tests with Soybean Varieties
Multiple authors.
Coordinating author: J. Lingenfelter
KS Agric. Exp. Stn. Report of Prog. 1003, December 2008
- 09-109-S 2008 Kansas Performance Tests with Grain Sorghum Hybrids
Multiple authors.
Coordinating author: J. Lingenfelter
KS Agric. Exp. Stn. Report of Prog. 1004, December 2008
- 09-121-J Grazing effects on yield and quality of hard red and hard white winter wheat
J. Holman, C. Thompson, R. Hale, A. Schlegel
Agronomy Journal, 101(4):775-788, 2009
- 09-140-J Selection before backcross during exotic germplasm introgression
N. Ochanda, J. Yu, P.J. Bramel, A. Menkir, M.R. Tuinstra, M.D. Witt
Field Crops Research, 112:37-42, 2009
- 09-145-J Measuring seepage from waste lagoons and earthen basins with an overnight water balance test
J.M. Ham, K.A. Baum
Transactions of the ASABE, 52:835-844, 2009
- 09-153-S 2009 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland
Multiple authors.
Coordinating author: D. Peterson
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