



DIRECTOR'S REPORT OF RESEARCH IN KANSAS 2015

JULY 1, 2014–JUNE 30, 2015

K-STATE
Research and Extension

Letter of Transmittal

Office of the Director

To the Honorable Sam Brownback, 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, 2015. This report contains the title, author, and publication information for manuscripts published by station scientists. The report was published only in electronic format.

John D. Floros, Ph.D.
Director, K-State Research and Extension
Dean, College of Agriculture

A Message from the Director

It is a pleasure to provide the 2015 Director's Report of Research in Kansas. The report documents our current research programs 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. This reduces printing costs and makes the report accessible to a broader audience.

The 2015 Director's Report of Research in Kansas includes a list of journal articles, station publications, and other published manuscripts from scientists in our departments, research stations, and associated programs.

The Agricultural Experiment Station serves as the research component of K-State Research and Extension. During our strategic planning process, we received input from 5,000 stakeholders to determine five grand challenges facing Kansans — global food systems, water, health, developing tomorrow's leaders, and community vitality. Our research programs provide the latest information through our statewide extension network to address those challenges.

John D. Floros, Ph.D.
Director, K-State Research and Extension
Dean, College of Agriculture



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



A Message from the Associate Director of Research

The Hatch Act established the Kansas Agricultural Experiment Station in 1887 as the food, agriculture, and natural resources research component of Kansas State University, the state’s only land-grant university.

Our statewide network of centers and experiment fields allows our faculty to evaluate crop and livestock production systems across a wide range of environmental conditions.

Southeast Kansas is approximately 2,000 feet lower in elevation, receives almost 25 inches more precipitation per year, and the temperature averages about six degrees warmer than northwest Kansas. To be successful, producers must have access to crop varieties and management strategies developed for their local climate and soil conditions. Researchers work closely with farmers and ranchers to ensure that projects directly relate to local needs.

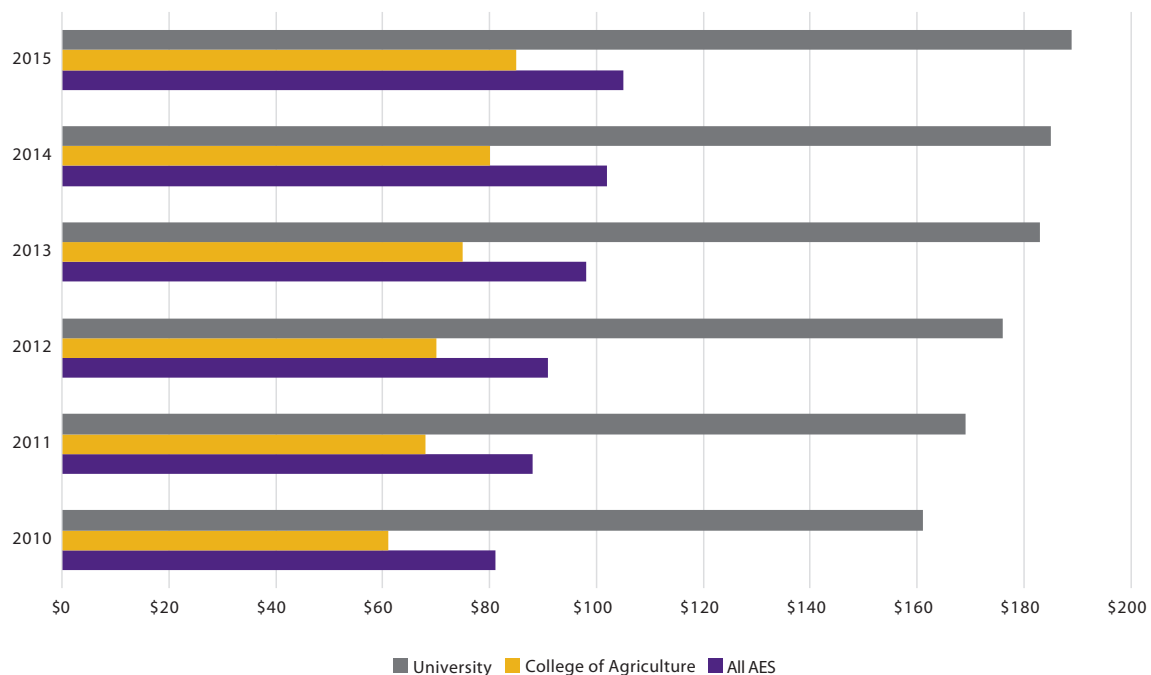
K-State’s Agricultural Experiment Station funds research in 20 academic departments across five colleges on three campuses. In addition to long-term research projects on livestock and crop breeding, scientists are looking at new ways to control pests and diseases, emerging technologies to save water and energy, food safety, postharvest storage, weed control, and more.

As Kansas’ largest employer, agriculture contributes 43 percent of the state’s economy. More than 234,000 people are involved in the production, distribution, and transportation of agricultural products. Our research focuses on the agricultural industry and helping it grow in a sustainable manner.

Kansas Agricultural Experiment Station research expenditures — all funds used to produce research outcomes — represent the majority of Kansas State University’s total research effort. Funds are usually awarded through a highly competitive federal grant system.

J. Ernest Minton
 Associate Director, Research, K-State Research and Extension
 Associate Dean, Research and Graduate Programs, College of Agriculture

Agricultural Experiment Station and University Research Expenditures (in millions)



Making a State Impact



Drop by precious drop: Researchers and farmers work together

From Kansas City to Liberal, we're reliant on farmers to help grow the world's food supply and contribute to the \$64.6 billion that agriculture brings to the state's economy. But growing crops requires water, which is in short supply and growing scarcer in parts of the state.

Kansas State University researchers and Kansas farmers are collaborating to determine if a new technology, mobile drip irrigation (MDI), works well enough to merit the upfront purchase and maintenance costs of installation on farms on a broad scale.

Mobile drip irrigation brings together existing technology — center pivot systems that are highly visible in some parts of the state — with new hose-like products called drip irrigation lines, said Danny Rogers, K-State Research and Extension irrigation engineer.

With the widely used center-pivot systems, water is sprayed either above or within the canopy of the crop that's being irrigated. Some of the water stays on leaves or is lost to evaporation before it reaches the ground, possibly as much as 20 percent. By adding drip lines, which drag along the soil surface, less water is lost to evaporation and more is available for plants' roots.

"It started with a question," extension water resource engineer Jonathan Aguilar said of how K-State scientists and farmers began working together to test the new irrigation method. He and other K-State researchers were already studying the new technology on a limited scale on university property near Garden City. But first one farmer, then another asked the researchers if the technology worked as well as manufacturers claimed — especially for large-scale farming.

Ensuing discussions, which included the Kansas Water Office and Kansas Department of Agriculture, led to establishing three water-technology demonstration farms in 2016 — all on privately owned farmland. K-State is now conducting multiyear MDI equipment studies with various crops and soil types on two farms near Garden City and one near Larned.

Garden City overlies the Ogallala Aquifer, a massive underground water source that is increasingly being depleted, and Larned is over the Big Bend Prairie Aquifer.

"Part of the work is focused on education," Aguilar said. To help show farmers and others how the technology may be used and shed light on the research that's underway, K-State Research and Extension and the Kansas Water Office hosted field days on the three farms in 2016. The events drew more than 350 people, about twice as many at each site than a normal educational event. More such events are planned in upcoming years.

Pictured at left is Isaya Kisekka, research water resource engineer at the Southwest Research Extension Center in Garden City. Kisekka is one of the many faculty members working on this project in the Garden City area.

22

Watershed Restoration and Protection Strategy (WRAPS) plans developed and implemented (2010–2016)

56

Mesonet weather data stations available throughout the state

Research Components of the Kansas Agricultural Experiment Station

(see map, next page)

Academic Departments

College of Agriculture

Agricultural Economics
Agronomy
Animal Sciences and Industry
Communications and Agricultural Education
Entomology
Grain Science and Industry
Horticulture and Natural Resources
Plant Pathology

College of Arts and Sciences

Biochemistry and Molecular Biophysics
Biology
Sociology, Anthropology, and Social Work
Statistics

College of Engineering

Biological and Agricultural Engineering
Chemical Engineering

College of Human Ecology

Apparel, Textiles, and Interior Design
Hospitality Management
Food, Nutrition, Dietetics and Health

College of Veterinary Medicine

Anatomy and Physiology
Clinical Sciences
Diagnostic Medicine/Pathobiology

Research Centers

Agricultural Research Center
(Hays, HB Ranch, and Saline Experimental Range)
John C. Pair Horticultural Center (Haysville)
K-State Research and Extension Center
for Horticultural Crops (Olathe)
Northwest Research-Extension Center (Colby)
Southeast Agricultural Research Center (Parsons,
Columbus, Mound Valley)
Southwest Research-Extension Center (Garden City)
Southwest Research-Extension Center (Tribune)

Experiment Fields

East Central – Ottawa
Kansas River Valley – Rossville, Topeka
North Central and Irrigation – Belleville, Scandia
Pecan Field – Chetopa
South Central – Hutchinson

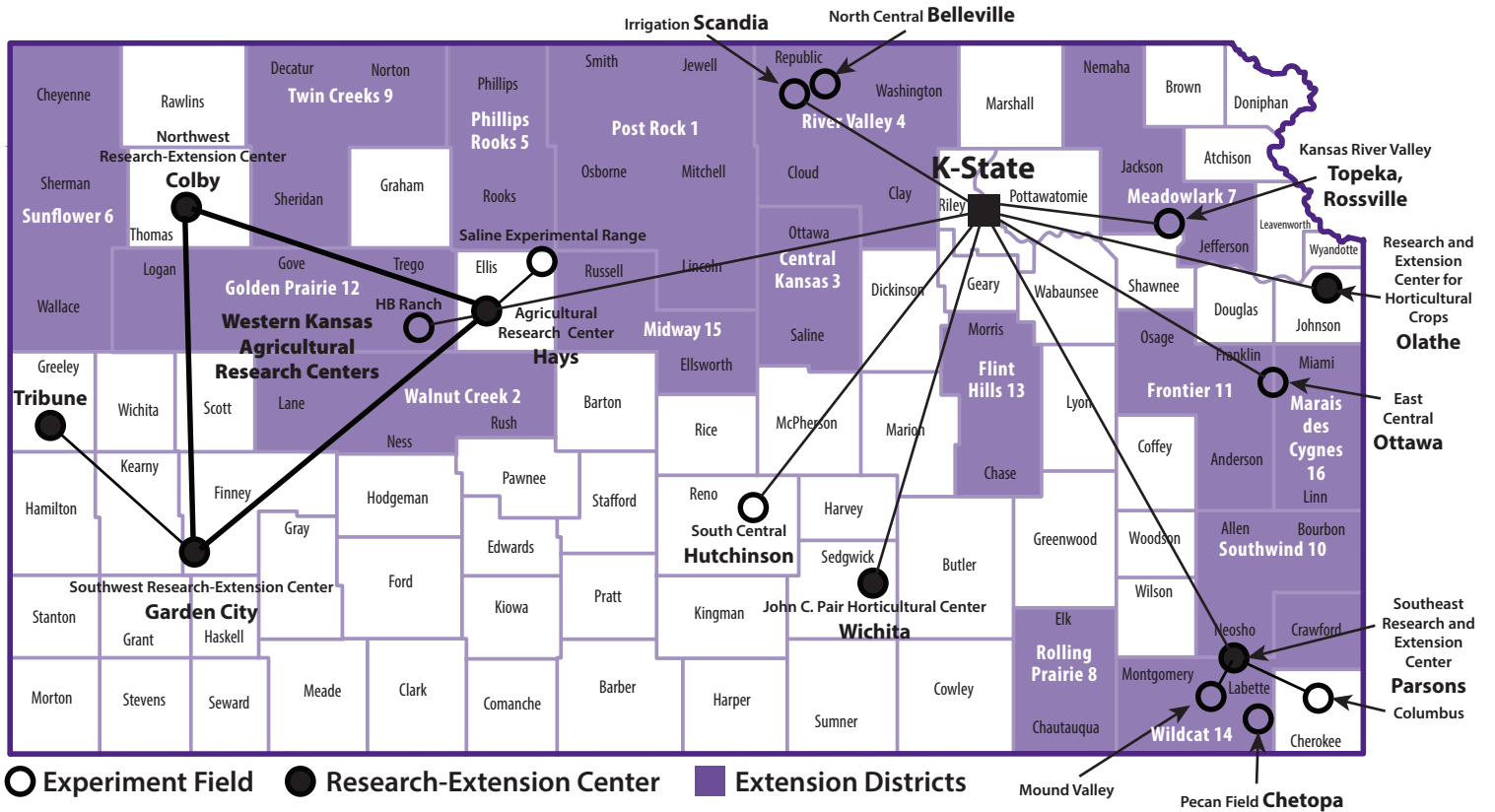
Associated Programs

Bioprocessing and Industrial Value Added Products
Center for Biobased Products by Design
Center for Sustainable Energy
Food Science Institute
Great Plains Diagnostic Network
Center for Sorghum Improvement
IGP Institute
K-State Libraries
Kansas Agriculture and Rural Leadership
Kansas Center for Agricultural Resources
and the Environment
Kansas Center for Sustainable Agriculture
and Alternative Crops
Kansas Water Resources Institute
Konza Prairie Biological Station
National Science Foundation Industry/University
Cooperative Research for Wheat Genetics
Plant Biotechnology Center
Veterinary Diagnostic Laboratory
Weather Data Library
Wheat Genetics Resource Center

USAID Feed the Future Innovation Labs

Applied Wheat Genomics
Reduction of Post-Harvest Loss
Sorghum and Millet
Sustainable Intensification

Kansas State University Agricultural Research Locations



Station Publications

Reports of Progress

SRP 1107	K-State Turfgrass Research 2014
SRP 1108	2014 Kansas Performance Tests with Winter Wheat Varieties
SRP 1109	2014 Kansas Performance Tests with Corn Hybrids
SRP 1110	Swine Day 2014
SRP 1111	Dairy Research 2014
SRP 1112	2014 Kansas Performance Tests with Soybean Varieties
SRP 1113	2014 Kansas Performance Tests with Grain Sorghum Hybrids
SRP 1114	2014 Kansas Performance Tests with Sunflower Hybrids
SRP 1116	2014 National Winter Canola Variety Trial
SRP 1117	2015 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland *Cattlemen's Day 2015 Field Research 2015 Kansas Fertilizer Research 2015 Roundup 2015, Agricultural Research Center-Hays 2015 Agricultural Research, Southeast Agricultural Research Center Field Day 2015, Southwest Research-Extension Center

Special Publications

DRR14	Director's Report of Research in Kansas 2014
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Understanding Contribution Numbers

Contribution numbers have three parts:

- The first two digits denote the year (state fiscal) of assignment.
- The second set of digits identifies the manuscript (numbered consecutively throughout the year).
- The suffix letter identifies the type of publication.

- 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 at:

<http://newprairiepress.org/kaesrr/>
<http://www.bookstore.ksre.ksu.edu/>

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, simply paste the doi into your browser or visit <http://dx.doi.org/>.

*As of March of 2015, Kansas Agricultural Experiment Station reports are posted at <http://newprairiepress.org/kaesrr/>. These reports no longer have "SRP" numbers. They are now listed by volume and issue (2015 Cattlemen's Day Research, Volume 1, Issue 1; <http://newprairiepress.org/kaesrr/vol1/iss1/>). Recommended citations and DOI numbers are listed with each report.

Recommended Citation

Vesco, A. C.; Sexten, A. K.; Weibert, C. S.; Oleen, B. E.; Hollenbeck, W. R.; Grimes, L. C.; and Blasi, Dale (2015) "Evaluation of the Productivity of a Single Subcutaneous Injection of LongRange in Stocker Calves Compared With a Positive (Dectomax) and a Negative (Saline) Control," Kansas Agricultural Experiment Station Research Reports: Vol. 1: Iss. 1. <http://dx.doi.org/10.4148/2378-5977.1018>

Agricultural Economics

- 14-346-T Overview of the Results of the Population-Based Survey of Northern Ghana, 2012
V. Amanor-Boadu
Monitoring, Evaluation and Technical Support Services (METSS), U.S. Agency for International Development (USAID), 2012
- 15-003-D Staff, programs, and publications in agricultural economics, Kansas State University, 2013
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Department Staff Paper, 15-01
SP15-01(2013):1-47
- 15-072-J Introduction of electronic combinatorial auction to a food manufacturer
K.D. Harris, A. Biere
International Food and Agribusiness Management Review, 2014
17(3): 171-186
- 15-080-J Consumer Responses to Multiple and Superfluous Labels in the Case of Eggs
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2016 Journal of Food Distribution Research
47(2016)2
- 15-082-J Regression estimates of different land type prices and time adjustments
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192-203
- 15-085-J The effects of policy expectations on crop supply, with an application to base updating
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American Journal of Agricultural Economics, 2014
96(3):903-923
- 15-086-J Crop supply dynamics and the illusion of partial adjustment
N.P. Hendricks, A. Smith, and D.A. Sumner
American Journal of Agricultural Economics, 2014
96(5):1469-1491
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- 15-087-J Futures prices in supply analysis: Are instrumental variables necessary?
N.P. Hendricks, J.P. Janzen, A. Smith
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- 15-088-J The environmental effects of crop price increases: Nitrogen losses in the U.S. Corn Belt
N.P. Hendricks, S. Sinnathamby, K. Douglas-Mankin, A. Smith, D.A. Sumner, and D.H. Earnhart
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May 2015, Vol. 9 No. 2, p. 244-248
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S.M. Funk, J.S. Bergtold
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- 15-162-J Crop machinery benchmarks
M. Langemeier, G. Ibendahl
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204-213

- 15-163-J Characteristics that help a farm achieve long-term viability
G. Ibendahl, M. Langemeier
Journal of the American Society of Farm Managers and Rural Appraisers, 2014
240-250
- 15-164-J Revealed demand for country-of-origin labeling of meat in the United States
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Journal of Agricultural and Resource Economics
38(2):235-247, 2013
- 15-165-J Dairy farmer policy preferences
C. Wolf, G. Tonsor
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38(2):220-234, 2013
- 15-296-A Using the K-State center pivot sprinkler and SDI economic comparison spreadsheet - 2015
F.R. Lamm, D. O'Brien, and D.H. Rogers
Proceedings of the 27th Annual Central Plains Irrigation Conference, Colby, Kansas, February 17-18, 2015, Pages 161-168
- 15-303-D Staff, programs, and publications in agricultural economics, Kansas State University, 2014
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Departmental Staff Paper, 15-02
SP15-02(2014):1-45
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- 13-279-J Some Biological Properties of Isolates of *Triticum* mosaic virus From the Great Plains states of the USA
D.L. Seifers, S. Wegulo, G. Hein, G. Byamukama, E. De Wolf, N. Tisserat, and M. Langham
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<http://dx.doi.org/10.1080/07060661.2014.924028>
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A. Anandhi, R.S. Nanjundiah
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doi:10.1007/s00704-013-1043-5
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The Professional Animal Scientist
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- 15-016-S 2014 Kansas performance tests with winter wheat varieties
Multiple authors
Coordinating author, J. Lingenfelser
Kansas Agricultural Experiment Station
Report of Progress 1108, July 2014
- 15-017-S 2014 Kansas performance tests with corn hybrids
Multiple authors
Coordinating author, J. Lingenfelser
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Report of Progress 1109, November 2014
- 15-018-S 2014 Kansas performance tests with soybean varieties
Multiple authors
Coordinating author, J. Lingenfelser
Kansas Agricultural Experiment Station
Report of Progress 1112, December 2014
- 15-019-S 2014 Kansas performance tests with grain sorghum hybrids
Multiple authors
Coordinating author, J. Lingenfelser
Kansas Agricultural Experiment Station
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- 15-020-S 2014 Kansas performance tests with sunflower hybrids
Multiple authors
Coordinating author, J. Lingenfelser
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- 15-065-J Consultant's perspective on the evolution and management of glyphosate-resistant kochia (*Kochia scoparia*) in western Kansas
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- 15-178-S 2015 Chemical weed control for field crops, pastures, rangeland, and noncropland
Multiple authors; coordinating author
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A.K. Obour, P.W. Stahlman, and J.D. Holman
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D.A. Ruiz Diaz
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X. Zhang, G. Bai, R. Xu, and G. Zhang
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Agronomy

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A. Anandhi, R.S. Nanjundiah
Theoretical and Applied Climatology, 2014
doi: [10.1007/s00704-013-1043-5](http://dx.doi.org/10.1007/s00704-013-1043-5)
- 13-316-J Mapping QTL for the Traits Associated with Heat Tolerance in Wheat (*Triticum aestivum* L.)
S.K. Talukder, M.A. Babar, K. Vijayalakshmi, J.A. Poland, P.V. Vara Prasad, and A.K. Fritz
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DIRECTOR'S REPORT OF RESEARCH IN KANSAS 2015

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