2018

Director's Report of Research in Kansas 2017

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Director's Report of Research in Kansas 2017

Abstract
The 2017 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-extension centers, and associated programs.

Keywords
Agriculture

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Director’s Report of Research in Kansas 2017

July 1, 2016–June 30, 2017
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, 2017. 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 2017 Director’s Report of Research in Kansas. The report documents our research programs and some of our accomplishments. K-State Research and Extension provides trusted, practical education to help individuals, businesses and communities solve problems, develop skills, and build a better future.

This report is produced and distributed in electronic format. This reduces printing costs and makes the report accessible to a broader audience.

The 2017 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-extension centers, and associated programs.

The Kansas Agricultural Experiment Station was established in 1887 to conduct research vital to the success of Kansas. In 1914, the Kansas Cooperative Extension Service was created to disseminate research-based information to the public. 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 network to address those challenges.

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

3  *Letter of Transmittal*

4  *A Message from the Director*

6  *A Message from the Associate Director of Research*

7  *Making a State Impact*

8  *Research Components of the Kansas Agricultural Experiment Station*

10  *Station Publications*

   10  Reports of Progress
   10  Special Publications
   10  Understanding Contribution Numbers
   11  Agricultural Economics
   12  Agricultural Research Center - Hays
   15  Agronomy
   24  Anatomy and Physiology
   25  Animal Sciences and Industry
   29  Apparel, Textiles, and Interior Design
   29  Biochemistry and Molecular Biophysics
   31  Biological and Agricultural Engineering
   34  Division of Biology
   37  Clinical Sciences
   37  Communications and Agricultural Education
   38  Diagnostic Medicine/Pathobiology
   41  Entomology
   44  Food, Nutrition, Dietetics and Health
   45  Grain Science and Industry
   50  Horticulture and Natural Resources
   52  Northwest Research-Extension Center
   52  Plant Pathology
   57  Southeast Research and Extension Center
   59  Southwest Research-Extension Center
   60  Statistics

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**PDF 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.
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 nation’s first operational 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.

This research helps Kansas farmers contribute to feeding a growing world population. By 2050, there will be an estimated 9.6 billion people globally. Every year, we develop and test nearly 1,000 new wheat breeding lines, tirelessly working to find only the best ones that will grow well in Kansas. In 2016, one of our varieties – Everest – was the top variety planted in Kansas for the fourth straight year.

Great wheat varieties mean great harvests for Kansas farmers, which in turn benefits the local, regional and state economies.

K-State’s Agricultural Experiment Station funds research in 20 academic departments across five colleges on two 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 an example of the value of this work, it is estimated that Kansas’ farms would lose $2.4 billion in crop yield value if weeds are not controlled.

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
Making a State Impact

Time to Burn: Study examines best season for prescribed burns

As researchers continue exploring the benefits of summer prescribed burning, Kansas land managers may be on the brink of a real opportunity to explore this alternative on their own property.

KC Olson, K-State professor of range beef cattle nutrition and management, has been researching the benefits of moving prescribed burning from spring to late summer.

Olson’s research began in 2014. The data from that four-year study shows late-summer burning dramatically reduces the incidence of sericea lespedeza, a noxious weed found in at least one-third of the Flint Hills. The plant is known to out-compete native plants for water and nutrients, and it contains high levels of condensed tannins that make it undesirable for cattle grazing.

“We’ve started data collection for a six-year trial, which will involve livestock performance as a primary metric,” he said. “We’re going to test the influences of a traditional spring burn, a summertime burn in the August-September interval, and a fall burn in the September-October interval, to see how those options influence subsequent livestock performance.”

Olson hopes to make a significant contribution to the growing pile of data, confirming the benefits of summer burning.

Poor weather conditions this past April prompted some landowners to postpone pasture burning. Many worried that the moisture was inadequate to fuel the lush regrowth, which is the impetus for burning. Olson hopes pasture managers try summer burning.

Spring versus summer

Like a spring burn, you’re still applying fire to plant material. “I recommend people hang their old fire management paradigms on a hook and look at it with fresh eyes, because this is a different animal,” Olson said.

“Expect it to move at about one quarter of the surface wind speed. For example, if the surface wind speed is 10 miles an hour, expect that fire to move at about 2 1/2 miles an hour. You can walk and keep up with these things.”

In summer, green and growing foliage contains more water. For the people working the fire, as well as neighbors, the experience is less irritating.

“As the fire makes contact, that water flash boils,” Olson said. “The smoke cloud looks dense, more intimidating, but that’s because of all the steam.”

To reduce walking in extreme heat, Olson modified his prescribed fire team. “We’re using more small vehicles – think all-terrain vehicles – to work that fire line. If possible, no one walks more than a few feet to spare our people unnecessary exertion in extremely hot temperatures.”

Olson added that his summer burn teams generally employ fewer people than his spring burn teams.

“The aftermath of a spring fire usually looks like a pool table – slick, black, and little residual material,” Olson observed. “In the summer, fire intensity is much lower. Chances are most of the above ground vegetation is not going to go away completely. You will see standing green material immediately after the fire passes, and it looks like the fire didn’t have any effect at all. But maybe 48 hours after the fire, what was standing green material the day of the fire is now brown, dead, and top-killed. You’ve just caused the whole plant community to reboot itself.”

While those are the major differences between spring and summer burns, all the rules and ordinances apply. You still have to contact your county government for a burn permit. You still have to advise local emergency management teams of your fire, both before you light it and after it’s out.

Professor KC Olson, left, initiates a summer pasture burn to reduce the incidence of sericea lespedeza, a noxious weed found in at least one-third of the Flint Hills.
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
- Division of Biology
- Sociology, Anthropology, and Social Work
- Statistics

**College of Engineering**
- Biological and Agricultural Engineering

**College of Human Ecology**
- Apparel, Textiles, and Interior Design
- Hospitality Management
- Family Studies and Human Services
- 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)
- K-State Research and Extension Center for Horticultural Crops (Olathe)
- Northwest Research-Extension Center (Colby)
- Southeast Research and Extension Center
  (Parsons, Columbus, Mound Valley)
- Southwest Research Center (Tribune)
- Southwest Research-Extension Center (Garden City)

**Experiment Fields**
- East Central (Ottawa)
- John C. Pair Horticultural Center (Haysville)
- Kansas River Valley (Rossville, Topeka)
- North Central and Irrigation (Belleville, Scandia)
- Pecan Field (Chetopa)
- South Central (Hutchinson)

**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**

**Associated Programs**

- AgManager.info
- Beef Cattle Research Center
- Beef Stocker Unit
- Bio Materials and Technology Lab
- Bioprocessing and Industrial Value-Added Products
- Biosecurity Research Institute
- Cargill Feed Safety Research Center
- Center for Bio-based Products by Design
- Center for Risk Management Education and Research
- Center for Rural Enterprise Engagement
- Center for Sorghum Improvement
- Center for Sustainable Energy
- Environmental Health and Safety Office
- Food Science Institute
- Fungal Genetics Stock Center
- Grain-Feed Microbiology and Toxicology Laboratory
- Great Plains Diagnostic Network
- International Grains Program Institute
- Insect Zoo
- Hal Ross Flour Mill
- Horse Unit
- K-State Global Food Systems
- K-State Libraries
- K-State Meat Lab (cookery, sensory, color, chemistry, microbiology, customized)
- K-State Pet Food Program

- K-State Radio Network
- K-State Rapid Response Center
- Kansas Agriculture and Rural Leadership
- Kansas Center for Agricultural Resources and the Environment
- Kansas Center for Sustainable Agriculture and Alternative Crops
- Kansas Cooperative Extension Service
- Kansas FFA
- Kansas Wheat Innovation Center
- Kansas Youth Institute
- Kansas Value-Added Foods Lab
- Kansas Water Resources Institute
- Konza Prairie Biological Station
- KSRE News and Media Services
- National Science Foundation Industry/University Cooperative Research for Wheat Genetics
- O. H. Kruse Feed Technology Innovation Center
- Plant Biotechnology Center
- Sheep and Meat Goat Center
- Soil Carbon Center
- Tom Avery Poultry and Game Bird Research Unit
- University Gardens
- Veterinary Diagnostic Laboratory
- Weather Data Library
- Wheat Genetics Resource Center
- Wheat Quality Lab
Station Publications

Reports of Progress

SRP 1128  2016 Kansas Performance Tests with Winter Wheat Varieties
SRP 1129  2016 Kansas Performance Tests with Corn Hybrids
SRP 1130  2016 Kansas Performance Tests with Soybean Varieties
SRP 1131  2016 Kansas Performance Tests with Grain Sorghum Hybrids
SRP 1133  2016 Kansas Performance Tests with Sunflower Hybrids
SRP 1132  2017 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland
  *Cattlemen’s Day 2017
  2017 Agricultural Research, Southeast Agricultural Research Center
  K-State Turfgrass Research 2017
  Kansas Field Research 2017
  Kansas Fertilizer Research 2017
  Field Day 2017, Southwest Research-Extension Center
  Swine Day 2017
  Dairy Research 2017

Special Publications

DRR16  Director’s Report of Research in Kansas 2016

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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/.

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*As of March 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

<table>
<thead>
<tr>
<th>Journal/Magazine</th>
<th>Title of the Article</th>
<th>Authors</th>
<th>Volume</th>
<th>Issue</th>
<th>DOI or URL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Johnsonville Sausage LLC: finding new opportunities beyond the pork commodity markets</td>
<td>K. Harris</td>
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<td></td>
<td>doi.org/10.1108/TCJ-11-2017-0106</td>
</tr>
<tr>
<td></td>
<td>Cooperating to compete: turning toward a community of practice</td>
<td>K.D. Harris, H.S. James Jr., A. Harris</td>
<td>Vol. 38, Issue 4</td>
<td></td>
<td>doi.org/10.1108/JBS-03-2016-0035</td>
</tr>
<tr>
<td></td>
<td>Women’s empowerment in agriculture and household-level health in northern Ghana: A capability approach</td>
<td>Y.A. Zereyesus</td>
<td>Vol. 29, Issue 7</td>
<td></td>
<td>doi.org/10.1002/jid.3307</td>
</tr>
<tr>
<td></td>
<td>The production of food and fiber: An adaptation of CoP features for sustainable water use in agribusiness</td>
<td>K.D. Harris, H.S. James</td>
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</tr>
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</table>
16-267-J  Reduced absorption of glyphosate and decreased translocation of dicamba contribute to poor control of kochia (*Kochia scoparia*) at high temperature  
J. Ou, P.W. Stahlman, M. Jugulam  
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May 2018  
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Chapter in book: Sorghum: State of the art and future perspectives  
C.R. Little, R. Perumal  
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