

Midwest Cover Crops Council
2019 Kansas Report

State Representative Information:

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Research: New and continued research on cover crops in a variety of crop rotations is occurring at several sites in Kansas. Some of the projects include:

- Chuck Rice – USDA NIFA water cap grant. Advisor to Soil Health Partnership, farmer's standard practices plus one new management. Validation and correlation of Haney and Cornell soil health tests.
- Lucas Haag – Rotation intensification. Colorado State CIG, covers for grazing, two years of data, 4 sites in Kansas. Spring and summer plantings.
- Kraig Roozeboom – Study initiated in 2007, continuing to present, at Ashland Bottoms. Wheat, Grain Sorghum, double crop Soybeans. Intensive insertion of cover crops. Kansas Agricultural Watershed and soybean diseases.
- Nathan Nelson – Kansas Agricultural Watershed (KAW) site, cropping system impacts on water quality, cover crops and fertilizer management and sediment loss, nutrient cycling, soil fertility, soil health parameters. National CIG for water quality and Soil Health – long term No-Till.
- Peter Tomlinson – Kansas Agricultural Watershed site, cropping system impacts on greenhouse gas emissions from agriculture, soil biological measurements. In 2018, established a new on-farm study to evaluate cover crop options ahead of cotton in south central Kansas.
- DeAnn Presley – Writing final report for a state CIG that concluded in 2018. Collaboration with N. Nelson on the KAW project.
- Stu Duncan – Brown, Doniphan counties. Highland Community College. 10 treatments, three replications, in a corn-soybean rotation – winter cover. Profile sample out of each plot. Collaborator with P. Tomlinson on new cover crops in cotton project in south central Kansas.
- Dan Devlin – USDA NIFA Water Cap. Grazing of cover crops.
- Gretchen Sassenrath – State CIG – precision conservation using cover crops to improve soil health and profitability, and control weeds; Grazing of cover crops, biomass production of different cover crops in southeast Kansas for extended grazing period, in collaboration with J. Farney. No-Till in SE KS. Focus on Soil Health, No-Till, Cover Crops, soil-borne diseases in soybeans and wheat. Demonstration of Soil Health.
- Augustine Obour – Cover crops in W-S-F – spring planted using as forage – Hay, graze, no graze. Summer planting after wheat. Sorghum replacement. W-SF-CC for sorghum replacement. BD, penetrometer, soil water at planting and termination, soil biology, SOC, Colby – glyphosate resistant weeds. New NCR-SARE funded cover crop research (started in fall 2018).
- John Holman – 12th year – soil water soil organic matter, carbon. Weed suppression, 3 years and nine site years of data. Hay or graze – H₂O use efficiency.
- Anita Dille – on farm studies on cover crops and weed suppression.
- Jaymelynn Farney – Animal scientist, grazing cover crops, toxic plants.

Extension & Outreach:

- Many new and ongoing extension programs are active in Kansas. Many cover crop field days and meetings occurred throughout the state with cooperation between Kansas State University Research and Extension, the Kansas NRCS, county Conservation Districts, and non-profit organizations such as the Kansas Alliance of Wetlands and Streams.
 - The Kansas NRCS and/or Conservation Districts have assisted with or been a part of numerous field days, tours, presentations, or workshops on soil health, cover crops, no-till, etc.
 - Numerous Kansas State University faculty giving presentations at local, state, and national level research or extension meetings on the topic of cover crops.

Contributors: Kansas State University, Kansas USDA-Natural Resources Conservation Service, Kansas Association of Conservation Districts, Kansas Alliance of Wetlands and Streams.

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Peer-reviewed publications during the reporting period:

- Farney, J.K., Sassenrath, G.F., Davis, C.J., Presley, D. 2018. Composition, forage production, and costs are variable in three-way cover crop mixes as fall forage. *Crop, Forage, & Turfgrass Management*, 4:180020. doi:10.2134/cftm2018.03.0020.
- Farney, J.K., Sassenrath, G.F., Davis, C.J., Presley, D. 2018. Forage mass production, forage nutritive value, and cost comparisons of three-way cover crop mixes. *Crop, Forage, & Turfgrass Management*. 4(1):170081. doi:10.2134/cftm2017.11.0081.
- Holman, J., K. Arnet, J. Dille, S. Maxwell, A. Obour, T. Roberts, **K. Roozeboom**, and A. Schlegel. 2018. Can cover or forage crops replace fallow in the semiarid central Great Plains? *Crop Sci*. 58:1–13. doi: 10.2135/cropsci2017.05.0324
- Osipitan, O.A., J.A. Dille, Y. Assefa, and S.Z. Knezevic. 2018. Cover crop for early season weed suppression in crops: Systematic review and meta-analysis. *Agron J*. 110:2211-2221.
- Osipitan, O.A., J.A. Dille, Y. Assefa, E. Radicetti, A. Ayeni, and S.Z. Knezevic 2019. Impact of cover crop management on level of weed suppression: A meta-analysis. *Crop Sci* 59:833-842

Reports of Progress (non-peer reviewed):

- Sassenrath, G.F., Little, C., Roozeboom, K., Lin, X., Jardine, D. 2019. Controlling soil-borne disease in soybean with a mustard cover crop. *Kansas Agricultural Experiment Station Research Reports: Vol. 5: Iss. 2.* <https://doi.org/10.4148/2378-5977.7740>
- Chism, L.I., Dille, J.A., Sassenrath, G.F. 2019. Using cover crops as an effective weed control method in Southeast Kansas. *Kansas Agricultural Experiment Station Research Reports: Vol. 5: Iss. 2.* <https://doi.org/10.4148/2378-5977.7743>
- Sassenrath, G.F., Farney, J.K. 2019. Biomass production of single species cover crop. *Kansas Agricultural Experiment Station Research Reports: Vol. 5: Iss. 2.* <https://doi.org/10.4148/2378-5977.7744>
- Farney, J.K. 2019. Cattle preference for annual forages. *Kansas Agricultural Experiment Station Research Reports: Vol. 5: Iss. 2.* <https://doi.org/10.4148/2378-5977.77432>
- Farney, J.K., Sassenrath, G.F. 2019. Evaluating single and multi-species summer cover crops for biomass yield. *Kansas Agricultural Experiment Station Research Reports: Vol. 5: Iss. 2.* <https://doi.org/10.4148/2378-5977.7733>