

## **SAES ANNUAL REPORT**

**Multistate Project (NC1181):** Enhancing Resiliency of Beef Production under Shifting Forage Resources

**Date of Annual Meeting:** August 12-13, 2015

**Period the Report Covers:** October 1, 2014 – September 30, 2015

### **Participant List**

Bruce Anderson – University of Nebraska, Lincoln  
Mary Drewnoski – University of Nebraska, Lincoln  
Jaymelynn Farney – Kansas State University, Manhattan  
Walt Fick – Kansas State University  
John Guretzky – University of Nebraska, Lincoln  
Debora Hamernik - University of Nebraska, Lincoln  
Keith Harmony – Kansas State University, Western KS Ag. Res. Center, Hays, KS  
Karla Jenkins – University of Nebraska, Panhandle R&E, Scottsbluff  
Lyle Lomas – Kansas State University, Southeast Ag. Res. Center, Parsons, KS  
James MacDonald – University of Nebraska, Lincoln  
Martin Massengale – University of Nebraska, Lincoln  
Joe Moyer – Kansas State University, Southeast Ag. Res. Center, Parsons, KS  
Jay Parsons – University of Nebraska, Lincoln  
Rick Rasby – University of Nebraska, Lincoln  
Daren Redfearn – University of Nebraska, Lincoln  
Walt Schacht – University of Nebraska, Lincoln  
Aaron Stalker– University of Nebraska, West Central R&E, North Platte  
Jerry Volesky – University of Nebraska, West Central R&E, North Platte

### **Brief Summary of Minutes of Annual Meeting**

Dr. Deb Hamernik (Administrative Advisor) addressed the group and explained that some groups invite USDA-NIFA personnel to attend these meetings by conference call or adobe connect. The consensus of the group was that we should invite Dr. Steve Smith, the program coordinator for USDA-NIFA systems work in the beef cattle area to join the 2016 meeting.

Preliminary results of studies related to each objective were discussed by each group member. One of the experiments implemented this year to address objective 2 was implemented in 3 locations in Kansas and 3 locations in Nebraska. The preliminary results of this collaborative project were very different across locations. Additional collaborative project ideas were discussed for objectives 3 and 5.

The meeting next year will be held in Hays, KS and will likely be held after the Grazing Conference in Kearney, NE.

### **Accomplishments**

#### **Objectives**

*List objective(s) worked on. The objectives listed in the project are:*

1. Optimize the utilization of crop residues by grazing and harvesting and determine the effects on agroecosystems.
2. Evaluate strategies to increase efficient use and productivity of range and pasturelands through strategic timing and density of stocking and shifting species composition to more productive species.
3. Evaluate effects of integrating annual forage crops into year-round forage systems for beef production.
4. Develop innovative beef systems that match shifting forage resources.
5. Conduct multi-faceted education/extension program to disseminate research results, to include extension papers as well as regional conferences on the use of crop residues, annual forages, and range and pastureland by livestock.

## **Accomplishments**

Nebraska

### *Short-term outcomes:*

- Objective 1
  - Beef producers can graze corn residue as a low cost feed option to improve sustainability without detrimental effects on subsequent corn grain productivity.
  - Average daily gains of calves grazing residue and supplemented with distillers grains can be predicted with reasonable accuracy.
  - Metabolizable protein supplementation with rumen undegradable protein is a key determinant in gains of growing calves grazing corn residue.
  - Harvesting methods which leave stems in the field result in higher quality residue bales.
- Objective 2
  - Measured dry forage mass of 4226 kg ha<sup>-1</sup> in unfertilized smooth brome grass stands on 2 June 2015 before interseeding annual warm-season grasses on 9 June 2015. The value is similar to other forage mass data we have collected in unfertilized smooth brome grass pastures at this location.
  - Soil moisture content at depths of 0-15 and 15-45 cm average 19% 1 d after planting on 10 June 2015.
  - Annual warm-season grass establishment success varied with species. Seedlings m<sup>-1</sup> row measured 30 d after planting on 7 July 2015 averaged 4 for corn, 18 for forage sorghum, 27 for sudangrass, 28 for sorghum-sudangrass, and 58 for pearl millet.
  - After 5 years of treatment application on Sandhills meadow, there is no difference in botanical composition and aboveground plant production among grazing systems (mob grazing, simple rotation grazing, and continuous grazing); and trampling of standing live vegetation is the greatest and harvest efficiency and yearling weight gain are the lowest for mob grazing.
  - On upland Sandhills range, grazing treatments (season-long continuous, 4-pasture deferred rotation, and 50-pasture rotation) have resulted in significant differences in grazing distribution with the 50-pasture rotation resulting in the most uniform distribution and continuous grazing the least. Effect of a heavy stocking rate (vs. moderate) is trending towards lower annual plant production. Length of grazing period (150 vs. 40 vs. 3 days) has not affected aboveground plant production.
- Objective 3
  - Late summer planted double cropped annual forages comprised of a mix of cool

season grasses and brassicas can be a source of high quality forage and be used to background growing calves. Steers weighing 250 to 300 kg appear to gain 0.68 to 1 kg/d in Nov and December. However, herbicide strategy has a major impact on success of double crop forages, especially brassica species.

- Objective 4
  - Pregnancy rates of cows wintered on corn residue while nursing calves were adequate (90 – 100%), but additional numbers are needed to determine real effects of wintering system on reproductive performance.
  - Preliminary data suggest that wintering summer-calving pairs on cornstalk residue as part of an intensively managed system may result in cow BW and BCS losses compared to feeding pairs in a drylot.
  - Any negative changes in BW or BCS may be less of a hindrance on reproduction provided losses occur well after the breeding season and cows are in adequate BCS ( $\geq 5.0$ ) prior to calving.
  - Daily gains for calves wintered on cornstalks with their dams may be similar to or less than those managed in a drylot, but delaying weaning beyond a conventional age (205 d) may increase weaning weight.
  - Complete sugarbeets can be mixed into a complete diet with wheat straw and wet distillers grains to maintain gestating beef cows on a limit fed diet.
  
- Objective 5
  - Research update articles have been disseminated to producers on forage cocktail mixtures.

### **Accomplishments**

South Dakota

*Short-term outcomes:*

- Objective 1
  - 45 corn hybrids were evaluated for yield and quality for corn and beef production.
  
- Objective 3
  - Experiments were initiated to evaluate impacts of stocking rate on performance and N excretion while grazing cover crops
  - An experiment was initiated evaluating cover crop mixtures for grazing cattle.
  
- Objective 5
  - Producer tours were given to show the progress of the cover crops.

Nebraska

*Outputs:*

- 6 peer-reviewed journal articles
- 4 professional presentations
- 9 scientific abstracts
- 21 research reports or proceedings
- 1 popular press article
- 7 webinars

### **Accomplishments**

Illinois

*Short-term outcomes:*

- Objective 1

- Four methods of processing corn stalk residue were determined to have similar impacts on cattle performance
- Objective 4
  - MaxQ and KY-31 tall fescue were determined to have similar digestibility. Differences in cattle performance when grazing the two cultivars are not due to digestibility differences.
- Objective 5
  - Two field days were conducted to share the research results from Objectives 1 and 4 so producers could implement best management practices based on research.

*Milestones:*

- Research has been initiated and economic evaluation is ongoing. Project results have been presented at scientific meetings.

*Impacts:*

- Additional means of harvesting corn stover will be available for producers to determine the best practice for within their system. Producers are already incorporating these results.

**Accomplishments**

Kansas

*Short-term outcomes:*

- Objective 2
  - Intensive early stocking rates were compared to continuous stocking rates on native pasture. Cow body condition score and calf weights were similar for both treatments. Yearling heifers also had similar gains regardless of treatment.
  - Legumes were interseeded into four tall fescue cultivars with varying endophyte status. Grazing will begin in 2016.
  - Warm season annual grasses were seeded into cool season perennial western wheatgrass and tall fescue at three locations across Kansas as part of a joint project with Nebraska where annuals were interseeded into cool season grasses across three locations.
- Objective 5
  - Extension meetings were conducted on research results of cover crop utilization for cattle and integrating crops and livestock. Approximately 450 producers attended.

Kansas

*Outputs:*

Webinar for Kansas agriculture agents about fall annual forages for cattle production. 10 listened live, but the webinar is posted on the internal website for future agent visits.

- Potentially toxic forage crops for livestock extension publication – MF3244, currently in publication department with estimated online publication date of October 2015
- AgToday radio interview about fall forage for cattle.
- Davis, C, D. Presley, J. Farney, G. Sassenrath. 2015. Evaluating multi-species cover crops for forage production. In: SEARC Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p

Kansas Project Impacts:

Interseeding warm-season annuals in cool-season grass pastures can improve their utility during the “summer slump” that typically occurs. Forage production and nutritive value could increase animal production and performance without requiring conversion of cropland to pasture. The potential of several forages needs to be evaluated for use in improving perennial pasture to extend the effective grazing season. The economic impact of beef production has been estimated from \$1850 to \$5200 per cow, depending on whether or not the economic impact of the feeder and finishing sector is separated from the cow/calf sector. If expansion of the forage resource on the same area were to enable the cowherd to expand from 29 million to 33 million head as a result of improved utilization for forage resources through the proposed strategy, the economic impact would be estimated at \$7.4 billion for the cow-calf sector, and over \$20 billion for the beef industry as a whole.

## Nebraska

### *Activities:*

- Objective 1
  - Ongoing work at the West Central Water Research Field Laboratory near Brule, NE and at the Monsanto Water Learning Center near Gothenburg, NE continues where research experiments aims to determine the effects of corn residue by grazing and baling.
  - The impacts of grazing cornstalk residue in 3 tillage methods on subsequent crops of corn, dry edible beans, and sugarbeets were evaluated. One year of data is collected. Subsequent yield was not different in any crop between grazing or not grazed. However, yield was greater for conventional tillage and zone tillage compared to no tillage.
  - Harvesting methods which collect different proportions of plant parts were evaluated.
  - Supplementation strategies of calves grazing residue were evaluated.
  - Collaborated with Iowa State University to submit a NIFA-CAP grant focused on integrating cropping and livestock systems using corn residue (Objective 1), double crop annual forages (Objective 3), and summer confinement of cows (Objective 4).
- Objective 2
  - Establishment of a project to evaluate success of interseeding annual warm-season grasses into existing cool-season grass pastures at three locations in Nebraska (Mead, North Platte, and Sidney) and three locations in Kansas (Parsons, Manhattan, and Hays).
  - Establishment of the multi-state experiment on interseeding annual warm-season grasses into existing cool-season grass pastures at Mead, Nebraska.
  - Collected and analyzed data from the first year of the interseeding experiment at Mead including measurements of forage production from smooth bromegrass before interseeding, soil moisture before planting, soil moisture 45 days after planting, annual warm-season establishment 30 days after planting, forage mass 45 days after planting, and forage functional composition (seeded species, cool-season grasses, and other species) 45 days after planting.
  - Established the interseeded annual warm-season grass experiment at Mead with a Great Plains No-Till Drill. Great Plains Ag is a Salina, Kansas based company that specializes in seeding equipment.
  - Continued the grazing studies on meadow and upland range at UNL’s Barta

Brothers Ranch. The sixth year of field data is being collected in 2015.

- Objective 3
  - Summer annual forage mixtures (forage cocktails) were compared to monoculture species in a semi-arid region in a dryland cropping rotation. Forages were evaluated for dry matter yield, crude protein, and total digestible nutrients. One year of data has been collected. There were no statistical differences in any mixtures or monocultures in tonnage produced, total digestible nutrients or acid detergent fiber. Crude protein was improved in the mixtures compared to the monocultures.
  - Collaborated with Kanas State University to submit a NCR-SARE grant focused on strengthening management guidelines for use of double cropped annual forages including species selection and grazing management.
- Objective 4
  - A second year of comparing summer calving cows wintered in a dry lot or wintered on corn residue was initiated.
  - Gestating beef cows were limit fed energy dense diets containing wheat straw, complete sugar beets and wet distillers grains or wheat straw, corn, and wet distillers grains. Diets were balanced to be isoenergetic. No differences in BCS change or BW were detected after a 47-d trial.
- Objective 5
  - Research from Objective 4 has been presented at 10 producer meeting and 3 producer conferences.
  - 2 field days related to Objective 1 were held at the West Central Water Research Field Laboratory.
  - Research results from the grazing strategy studies in Objective 2 have been presented at the 2015 Barta Brothers Field Day, the 2014 Gudmundsen Sandhills Laboratory Open House, the 2014 Nebraska Grazing Conference, and multiple producer meetings.
  - Collaborated with University of Nebraska-Lincoln Extension to submit a USDA-Risk Management Agency Risk Management Education Partnership proposal to provide comprehensive risk management education to livestock and forage producers in 2015-16.

*Milestones:*

- Objective 1
  - Fields were established or evaluations of established fields continued where residue was removed either by grazing or baling. Soil samples were collected from fields.
- Objective 2
  - Multistate interseeding projects were initiated as described in the Activities section above.
  - Data on the long-term impacts of grazing strategy on vegetation productivity and utilization, harvest efficiency, and rangeland health continues to be collected on meadow and upland range at the Barta Brothers Ranch.
- Objective 3
  - Purchased seed for the interseeding annual warm-season grass project, which is used across all locations, from Green Cover Seed in Bladen, Nebraska, a local

- source specializing in no-till cover crop seed and cover crop seed mixes.
    - Baseline soil measurements were taken on fields where cover crop research will be occurring.
  - Objective 4
    - Two treatments were imposed on multiparous, cross-bred beef cows that calve in July:
      - Cows and cow/calf pairs are managed in a drylot 365 days.
      - Cows and cow/calf pairs are managed in a drylot and graze corn residue.
      - At least three years of pregnancy data needs to be recorded.
      - Based on year one data, supplementation strategy may need adjusted to get comparable cow and calf performance.
  - Objective 5
    - Received funding (\$26,316) from the North Central Extension Risk Management Education Center to provide market risk management and cost of production training to cattle producers in Nebraska in 2015-16.

## Nebraska

### Impacts

- Effects of wintering system on cow-calf performance and reproduction in a summer-calving intensively managed cowherd were evaluated at two locations. Cow body condition change was not different between treatments in western Nebraska, but was greater for pairs fed in a drylot in eastern Nebraska. In western Nebraska, calf gain and weights were not different between treatments, but were greater for drylot calves in eastern Nebraska. Initial data indicate that wintering pairs on cornstalks may decrease cow performance and calf gain. If reproduction is adequate and grazing is not impeded, wintering pairs on cornstalks may be viable for later-calving cowherds.
- Data from previous studies (*2015 Nebraska Beef Cattle Report*, pp. 14-15 & 16-18) indicate that intensive management (confinement) of cowherds may be a viable alternative when forage resources for grazing are limited. Cornstalk residues represent a valuable forage resource for fall/winter grazing and may complement an intensive cow-calf production system because areas with fewer traditional forage resources also tend to favor grain crop production. Results from economic analyses of alternative cow-calf systems suggest that incorporating cornstalk grazing may decrease production costs (*2015 Nebraska Beef Cattle Report*, pp. 19-21). Gestating spring-calving cows have acceptable performance grazing cornstalk residue, yet few data are available regarding a lactating female and her calf when grazing the same forage resource.
- Although mob grazing, using ultrahigh stocking density during the growing season, is commonly reported to increase aboveground plant production and to increase soil organic matter and soil depth, we have found no improvement in vegetation characteristics or soil properties relative to other grazing strategies after 5 years on Sandhills meadows. Furthermore, mob grazing has not resulted in an increase in harvest efficiency, carrying capacity, or livestock performance. The additional infrastructure and human resource requirements of mob grazing compared to other grazing strategies does not appear to be justified.
- The length of grazing period during the growing season on upland Sandhills rangeland

does not affect aboveground plant production, botanical composition, or soil organic matter content after 5 years of treatment application. Stocking rate appears to be the principal management factor affecting vegetation cover regardless the length of grazing period.

Nebraska

**Publications (list in separate sections)**

*Peer-reviewed Journals*

1. Jenkins, K.H., S.A. Furman, J.A. Hansen, and T.J. Klopfenstein. 2015. Limit feeding high-energy, by-product-based diets to late-gestation beef cows in confinement. *Prof. Anim. Sci.* 31:109-113.
2. Parlak, A.O., M. Parlak, H. Blanco-Canqui, W.H. Schacht, J. Guretzky, and M. Mamo. 2015. Patch-brun grazing: implications on water erosion and soil properties. *J. Environmental Quality* 44:903-909.
3. Peterson, S. J., B. L. Nuttelman, D. B. Burken, M. K. Luebbe, G. E. Erickson, and J. C. MacDonald. 2015. Use of a pelleted corn residue complete feed in receiving diets. *The Professional Animal Scientist.* 31:201-206.
4. Scasta, J. D., Engle, D. M., Fuhlendorf, S. D., Redfearn, D. D., Bidwell, T. G. Meta-analysis of exotic forages as invasive plants in complex multi-functioning landscapes. *Invasive Plant Science and Management.* Accepted: April 27, 2015. doi: <http://dx.doi.org/10.1614/IPSM-D-14-00076.1>
5. Stephenson, M.B., W.H. Schacht, J.D. Volesky, K. Eskridge, and D. Bauer. 2015. Time of grazing effect on subsequent-year standing crop in the eastern Nebraska Sandhills. *Rangeland Ecol. & Manage.* 68:150-157.
6. Watson, A. K., J. C. MacDonald, G. E. Erickson, P. J. Kononoff, and T. J. Klopfenstein. 2015. Optimizing the use of fibrous residues in beef and dairy diets. *J. Anim. Sci.* 93:2616-2625.

*Abstracts/Posters/Professional Presentations*

1. Rasby, R., K.H. Jenkins, J. Warner, T. Klopfenstein. 2015. Managing beef cows in confinement. 2015 Northern States Beef Conference, January 4-5, 2015. Morton, MN. Proceeding.
2. Drewnoski, M., J. MacDonald, G. Erickson, K. Hanford and T. Klopfenstein. 2015. Long term effect of corn residue grazing on crop yields. *J. Anim. Sci.* 93, Suppl. 2: 24.
3. Cox, J., K. Hales, K. Ulmer, R. Rasby, S. Shackelford, H. Freetly, and M. Drewnoski. 2015. Effect of backgrounding system on beef calf performance. *Anim. Sci.* Vol. 93, Suppl. 3:885.
4. Jenkins, K.H., J. Warner, R.J. Rasby, and T.J. Klopfenstein. 2014. Limit feeding production cows in confinement. Ken and Caroline Eng Foundation Cow-Calf Symposium.
5. Jenkins, K.H. 2014. Limit feeding production cows in confinement. High Plains Nutrition Roundtable.
6. Jenkins, K.H. 2014. Limit feeding production cows in confinement. State of Beef Conference.
7. J.M. Warner, K.H. Jenkins, R.J. Rasby, M.K. Luebbe, G.E. Erickson, and T.J. Klopfenstein. 2014. Effects of calf age at weaning on cow and calf performance and feed utilization in an intensive production system. *JAS* 92(E-Supplement 2): pg 44 (Abstr 0101).



8. J.M. Warner, K.H. Jenkins, R.J. Rasby, K. Brooks, and T.J. Klopfenstein. 2014. An economic analysis of conventional and alternative cow-calf production systems. 2014. JAS 92(E-Supplement 2): pg 125 (Abstr 0283).
9. MacDonald, J. C., G. E. Erickson, P. J. Kononoff, and T. J. Klopfenstein. 2014. Optimizing the use of fibrous residues in beef and dairy diets. J. Anim. Sci. 92 (E-Suppl 2): 156 (Abstr.).
10. Harding, J. L., M. L. Jolly, J. C. MacDonald, and G. E. Erickson. 2014. Effects of processing of treated corn stover and distillers grains in intake and digestibility of feedlot diets. J. Anim. Sci. 296 (E-Suppl 2): 99 (Abstr.).
11. Jones, M., J. C. MacDonald, T. J. Klopfenstein, and G. E. Erickson. 2014. Comparison of commercially available lick tubs to daily by-product supplementation of calves grazing corn residue. J. Anim. Sci. 92 (E-Suppl 2): 772 (Abstr.).
12. Jones, M., J. C. MacDonald, T. J. Klopfenstein, G. E. Erickson, and A. K. Watson. 2014. Effect of distillers grains on average daily gain of cattle grazing corn residue. J. Anim. Sci. 92 (Suppl 2): 92 (Abstr.).
13. Jones, M., J. C. MacDonald, T. J. Klopfenstein, G. E. Erickson, K. Glewen, A. K. Watson. 2014. Evaluation of changes in nutritional quality of corn residue throughout the grazing period. J. Anim. Sci. 92 (Suppl 2): 99 (Abstr.).
14. Lindsey, T.W., W.H. Schacht, J.D. Volesky, and M.D. Redden. 2015. Animal activity influenced by grazing strategy. Annual Meeting of Society for Range Management, Sacramento, CA. Abstr.
15. Peterson, S. J., B. L. Nuttelman, D. B. Burken, J. C. MacDonald, and G. E. Erickson. 2014. Use of treated corn residues in growing diets. J. Anim. Sci. 92 (Suppl 2): 172 (Abstr.).

#### *Book Chapters*

None to report at this time.

#### *Curricula/Educational Materials*

1. Drenowski, M and D. Redfearn. 2015. Annual Cool-season Forages for Late-fall or Early-Spring Double-crop. NebGuide G2262.
2. Drenowski, M and H. Blanco. 2015. Effect of Grazing Double-Cropped Annual Forages on Soil and Crop Yields. NebGuide G2264.
3. Rasby, R., M. Drenowski, and L. Stalker. 2014. Grazing Crop Residues with Beef Cows. UNL Extension Circular. EC278: 1-14.  
<http://ianrpubs.unl.edu/live/ec278/build/ec278.pdf>

#### *Extension Reports/Publications*

1. Warner, J.M., A.J. Doerr, G.E. Erickson, R.J. Rasby, and T.J. Klopfenstein. 2015. Supplementing cow/calf pairs grazing smooth brome grass. 2015 Nebraska Beef Report. MP101:14-15.
2. Warner, J.M., C.J. Bittner, K.H. Jenkins, R.J. Rasby, M.K. Luebbe, G.E. Erickson, T.J. Klopfenstein. 2015. Effects of calf age at weaning on cow and calf performance and feed utilization in an intensive production system. 2015 Nebraska Beef Report. MP101:16-17.
3. Warner, J.M., K.H. Jenkins, R.J. Rasby, M.K. Luebbe, G.E. Erickson, and T.J. Klopfenstein. 2014. Effects of calf age at weaning on cow and calf performance and efficiency in a drylot/confinement production system. 2014 Nebraska Beef Report. MP99:27-28.

4. Drewnoski, M and J. Parsons. 2015. Converting Marginal Irrigated Cropland To Cool Season Perennial Forage Production: Will It Pay?. UNL BeefWatch Electronic Newsletter. <http://newsroom.unl.edu/announce/beef/4433/25184>.
5. Drewnoski, M. 2015. Benefits of Corn Residue Grazing. Center for Grassland Studies Newsletter. <http://grassland.unl.edu/documents/1980339/4508730/CGS+Winter-Spring+2015+web.pdf/48b82292-cd62-4bb6-811f-00f8555778f7>.
6. Jhala, A, B. Anderson and M. Drewnoski. 2015. Corn and Soybean Herbicide Options for Planting Cover Crops for Forage in Fall. UNL CropWatch Electronic Newsletter [http://cropwatch.unl.edu/archive/-/asset\\_publisher/VHeSpfv0Agju/content/cover-crop-herbicide-options](http://cropwatch.unl.edu/archive/-/asset_publisher/VHeSpfv0Agju/content/cover-crop-herbicide-options)
7. Anderson, B., Redfearn, D. (2014). Establishing Cover Crops as Annual Forages in Hail-damaged Crop Fields. BeefWatch. <http://newsroom.unl.edu/announce/beef/3455/19309>
8. Elmore, R., Redfearn, D., Hergert, G. W., Proctor, C., Blanco, H. (2014). Cover Crops: What we know and don't know., Amit Jhala (Ed.), (pp. 21-24). Lincoln NE: Proceedings 2015 Crop Production Clinics. Univ. of NE Extension. <http://agronomy.unl.edu/cpc>
9. Mitchell, R., Anderson, B., Redfearn, D. (2014). Switchgrass for Forage and Bioenergy. (pp. pp 48-53). Proceedings of the 2014 Nebraska Grazing Conference. Center for Grassland Studies.
10. Drewnoski, M., Redfearn, D. (2014). Grazing Corn Residue is Win-Win for Crop and Cattle Producers. UNL CropWatch. [http://cropwatch.unl.edu/archive/-/asset\\_publisher/VHeSpfv0Agju/content/grazing-corn-residue](http://cropwatch.unl.edu/archive/-/asset_publisher/VHeSpfv0Agju/content/grazing-corn-residue)
11. Drewnoski, M., Redfearn, D., Parsons, J. (2014). Adding Value to Calves by Grazing Corn Residue. (pp. 1). UNL BeefWatch. <http://newsroom.unl.edu/announce/beef/3616/21149>
12. Redfearn, D., B. Anderson, J. Volesky. (2015). Converting Cropland Back to Grass Pastures. UNL BeefWatch. <http://newsroom.unl.edu/announce/beef/3906/22010>
13. Redfearn, D., Drewnoski, M., Parsons, J. (2014). Hay Quality and Supplemental Feeding. UNL BeefWatch. <http://newsroom.unl.edu/announce/beef/3543/20505>
14. Burr, C., Effect of residue removal on irrigated corn yields. 2014 Demonstration Report, Monsanto Water Learning Center at Gothenburg, NE. Available at: <http://www.monsanto.com/products/documents/learning-center-research/2014/glc-lc-effect-of-residue-removal-on-irrigated-corn-yields.pdf>
15. Jones, M., J. C. MacDonald, G. E. Erickson, T. J. Klopfenstein, and R. Bondurant. 2015. Dried distillers grains supplementation of calves grazing irrigated corn residue. Nebr. Beef Cattle Rep. MP 101. Pp. 25-26.
16. Jones, M., J. C. MacDonald, G. E. Erickson, T. J. Klopfenstein, K. R. Brooks, D. B. Burken, R. Bondurant, and A. K. Watson. 2015. Comparison of commercial lick tubs to distillers grains supplementation for calves grazing corn residue. Nebr. Beef Cattle Rep. MP 101. Pp. 27-29.
17. Harding, J. L., C. J. Bittner, D. B. Burken, G. E. Erickson, and J. C. MacDonald. 2015. Effects of processing treated corn stover and distillers grains on performance of growing cattle. Nebr. Beef Cattle Rep. MP 101. Pp. 36-37.
18. Peterson, S. J., M. L. Bremer, A. L. Shreck, J. C. MacDonald, and G. E. Erickson. 2015. Digestibility of calcium oxide treated corn residue with de-oiled distillers grains. Nebr. Beef Cattle Rep. MP 101. Pp. 38-39.
19. Bremer, M. L., S. J. Peterson, A. L. Shreck, G. E. Erickson, T. J. Klopfenstein, and J. C. MacDonald. 2015. Digestibility of de-oiled modified distillers grains plus solubles in forage-based diets. Nebr. Beef Cattle Rep. MP 101. Pp. 40-41.

20. Updike, J. J., A. C. Pesta, R. G. Bondurant, J. C. MacDonald, S. Fernando, G. E. Erickson, T. J. Klopfenstein. 2015. Evaluation of the impact of an alternative corn residue harvest method on performance and methane emissions from growing cattle. *Nebr. Beef Cattle Rep.* MP 101. Pp. 42-44.
21. Drewnoski, M. E., L. A. Stalker, J. C. MacDonald, G. E. Erickson, K. J. Hanford, and T. J. Klopfenstein. 2015. Effect of corn residue removal on subsequent crop yields. *Nebr. Beef Cattle Rep.* MP 101. Pp. 53-55.
22. Jones, M., J. C. MacDonald, T. J. Klopfenstein, G. E. Erickson, K. Glewen, and A. K. Watson. 2015. Evaluation of changes in nutritional quality of corn residue over time. *Nebr. Beef Cattle Rep.* MP 101. Pp. 59-61.
23. Schacht, W.H. and J.D. Volesky. 2014. Mob grazing research. (pp. 11-15) *Proceedings of the 2014 Nebraska Grazing Conference.* Center for Grassland Studies.
24. Updike, J. J., J. L. Harding, T. J. Klopfenstein, and J. C. MacDonald. 2015. Effect of harvest method on in vitro digestibility of corn residues. *Nebr. Beef Cattle Rep.* MP 101. Pp. 62-63.
25. Parsons, J. and K. Brooks. 2015. "LRP Insurance Performance 2005-2014." UNL BeefWatch. University of Nebraska-Lincoln. Lincoln, NE. August 2015. <http://newsroom.unl.edu/announce/beef/4433/25161>.
26. Brooks, K. and J. Parsons. 2015. "Marketing Plans for Your Livestock Operation." UNL BeefWatch. University of Nebraska-Lincoln. Lincoln, NE. July 2015. <http://newsroom.unl.edu/announce/beef/4399/24975>.
27. Jansen, J. and J. Parsons. 2015. "The Livestock Forage Disaster Program and Estimated Drought Losses in Nebraska from 2012 to 2014." UNL BeefWatch. University of Nebraska-Lincoln. Lincoln, NE. <http://newsroom.unl.edu/announce/beef/4050/23231>.
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*Articles in the Popular Press (non-peer reviewed)*

1. Total confinement of beef cows is expensive. *Ridin' Herd.* Angus Journal. March 2014.

*Webinars/Videos and URL for online access*

1. Dry Lotting and Confinement Cows Series
  - [Part 1: Nutritional Considerations](#) (February 2015)
    - <http://beef.unl.edu/confinement-cows-series-part-1-nutritional-considerations>
  - [Part 2: Considerations on Facilities](#) (March 2015)
    - <http://beef.unl.edu/confinement-cows-series-part-2-facilities>
  - [Part 3: 42 Years of Research](#) (April 2015)
    - <http://beef.unl.edu/confinement-cows-series-part-3-42-years-of-research>
  - [Part 4: Economics](#) (April 2015)
    - <http://beef.unl.edu/confinement-cows-series-part-4-economics>
  - [Part 5: Pricing Feeds](#) (April 2015)

- <http://beef.unl.edu/confinement-cows-series-part-5-pricing-feeds>
- [Part 6: Management Considerations](#) (April 2015)
  - <http://beef.unl.edu/confinement-cows-series-part-6-management-considerations>
- [Part 7: Understanding Environmental Regulations](#) (April 2015)
  - <http://beef.unl.edu/temporaryconfinement>

*Student theses and/or dissertations*

None to report at this time.

South Dakota

*Extension Reports/Publications*

Grings, E. and R. Gates. Fall grazing of cover crops, July 24, 2014 SDSU Extension iGrow Website

Sexton, P., B. Rops, G.C. Buus, J. Shubeck, W. Rusche, and E. Grings. Preliminary studies on grain yield following grazing of annual forages in a no-till corn-soybean system. SE Farm Annual Report 2014. Page 15 – 17.

Grings, E., P. Sexton, and B. Rops. Preliminary results comparing grass and broadleaf based cover crop blends for livestock performance and effect on the following crop. SE Farm Annual Report 2014. Page 20 – 22.

*Articles in the Popular Press (non-peer reviewed)*

Grings, E., D.P. Casper and N. Mueller. Corn stalks can be great forage for beef and dairy cattle. Forage Focus. Page 20. December 2014

Illinois Publications:

*Peer-reviewed Journals*

1. Kim, Minseok, **Tara L. Felix**, Steve C. Loerch, and Zhongtang Yu. 2014. Effect of haylage and monensin supplementation on ruminal bacterial communities of feedlot cattle. *Curr. Microbiol.* 69:169-175.
2. **Felix, T.L.**, S.C. Loerch, and F.L. Fluharty. 2013. Protein supplementation for growing cattle fed a corn silage based diet. *Prof. Anim. Sci.* 30:327-332.
3. **Felix, T.L.**, C.J. Long, S.A. Metzger, and K.M. Daniels. 2014. Adaptation to various sources of dietary sulfur by ruminants. *J. Anim. Sci.* 92:2503-2510.
4. Bohrer, B.M., B.M. Edenburn, D.D. Boler, A.C. Dilger, and **T.L. Felix**. 2014. Effect of feeding ractopamine hydrochloride (Optaflexx) with or without supplemental zinc and chromium propionate on growth performance, carcass characteristics, and meat quality of finishing steers. *J. Anim. Sci.* 92:3988-3996.
5. Duckworth, M.J., A.S. Schroeder, D.B. Faulkner, G.C. Fahey, and **T.L. Felix**. 2014.

Effects of feeding calcium oxide treated wet distillers grains with solubles or treated corn stover to cattle on growth performance, carcass characteristics, and ruminal metabolism. *Prof. Anim. Sci.* 30:551-560.

6. Nuñez, A.J.C., **T.L. Felix**, R.P. Lemenager, and J.P. Schoonmaker. 2014. Effect of calcium oxide inclusion in beef feedlot diets containing 60% dried distillers grains with solubles on ruminal fermentation, diet digestibility, performance, and carcass characteristics. *J. Anim. Sci.* 92:3954-3965.
7. Schroeder, A.R., M. Iakiviak, and **T.L. Felix**. 2014. Effects of feeding dry or modified wet distillers grains with solubles with or without supplemental calcium oxide on ruminal metabolism and microbial enzymatic activity of beef cattle. *J. Anim. Sci.* 92:3997-4004.
8. Schroeder, A.R., M.J. Duckworth, D.W. Shike, J.P. Schoonmaker, and **T.L. Felix**. 2014. Effects of calcium oxide treatment of dry and modified wet distillers grains plus solubles on growth performance and apparent digestibility of feedlot steers. *J. Anim. Sci.* 92:4661-4668.
9. Stewart, J. L., C. F. Shipley, F. A. Ireland, **T. L. Felix**, V. L. Jarrell, S.C. Jimenez-Poveda, and D.W. Shike. 2014. Effects of different applications of pyrethrins and cyfluthrin, a synthetic pyrethroid, on bull reproductive parameters. *Clin. Therio.* 6:349
10. Shoup, L. M., A. C. Kloth, D. González-Peña, F. A. Ireland, S. Rodriguez-Zas, **T. L. Felix**, and D. W. Shike. 2015. Prepartum supplement level and age of weaning: I. Effects on pre- and postpartum cow performance and calf performance through weaning. *J. Anim. Sci.* (*Accepted*)
11. Shoup, L. M., D. González-Peña, F. A. Ireland, S. Rodriguez-Zas, **T. L. Felix**, and D. W. Shike. 2015. Prepartum supplement level and age of weaning: II. Effects of developmental programming on performance and carcass composition of steer progeny. *J. Anim. Sci.* (*Accepted*)
12. Segers, J. R., T. L. Felix, A. R. Green, G. N. Maia, B. C. Ramirez, and D. W. Shike. 2015. Effect of dietary fat concentration from condensed corn distillers' solubles, during the growing phase, on beef cattle performance, carcass traits, digestibility, and ruminal metabolism. *J. Anim. Sci.* 93:
13. Chapple, W.P., M.J. Cecava, D.B. Faulkner, and **T.L. Felix**. 2015. Effects of feeding processed corn stover and distillers grains on growth performance and metabolism of beef cattle. *J. Anim. Sci.* 93:
14. Nuñez, A.J.C., G. D. Lowe, **T.L. Felix**, S.C. Loerch, and J.P. Schoonmaker. 2015. Effect of dried distillers grains with solubles or corn in growing diets, followed by a corn-based finishing diet, on performance of feedlot cattle. *Anim. Feed Sci. Tech.* (*Accepted*)

*Posters/Professional Presentations*

Fiber Conference, Champaign, IL. "Use of chemical treatments to increase the energetic value of fiber". September 1, 2014

Alltech, Lexington, KY. “Insulin Resistance in Beef Cattle”. December 4, 2014

Alltech, Lexington, KY. “Programmed Nutrition”. December 4, 2014

Illinois Cattle Feeder Meeting, Macomb, IL. “Receiving and Transitioning Rations for Beef Cattle”. March 5, 2015

XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. Uberlandia, MG, Brazil. “Use of alternative feeds for beef cattle”. March 19, 2015.

XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. Uberlandia, MG, Brazil. “Transitioning beef cattle from forage to grain”. March 19, 2015.

XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. Uberlandia, MG, Brazil. “Limit feeding strategies to optimize efficiency in beef cattle”. March 20, 2015.

#### *Abstracts*

1. Edenburn, B.M., N.A. Pyatt, and **T.L. Felix**. 2014. Effects of dose and duration of ractopamine hydrochloride supplementation on growth performance and carcass characteristics of feedlot heifers. *J. Anim. Sci.* 92(E-Suppl. 2):74.
2. Shoup, L.M., A.C. Kloth, D. Gonzalez Peña Fundora, F.A. Ireland, S.L. Rodriguez Zas, **T.L. Felix**, and D.W. Shike. 2014. Prepartum supplement level and age of weaning: I. Effects on pre-and postpartum beef cow performance and calf performance through weaning. *J. Anim. Sci.* 92(E-Suppl. 2):65.
3. Shoup, L.M., D. Gonzalez Peña Fundora, F.A. Ireland, S.L. Rodriguez Zas, **T.L. Felix**, and D.W. Shike. 2014. Prepartum supplement level and age of weaning: II. Effects of developmental programming on performance and carcass composition of progeny. *J. Anim. Sci.* 92(E-Suppl. 2):66.
4. Bloemer, M.E., M. Srinivasan, F.A. Ireland, D.W. Shike, and **T.L. Felix**. 2015. Differences in forage quality when comparing novel and endophyte-infected fescue over the growing season. *J. Anim. Sci.* 93(E-Suppl. 2):193.
5. Timlin, C.L., J.L. Stewart, F.A. Ireland, C.F. Shipley, V.L. Jarrell, D.W. Shike, and **T.L. Felix**. 2015. Effects of different applications of pyrethrin/pyrethrod insecticides on bull reproductive parameters. *J. Anim. Sci.* 93(E-Suppl. 2):194-195.
6. Wilson, T. B., B. C. Ramírez, L. F. Rodriguez, A. R. Green, D. D. Boler, A. C. Dilger, **T. L. Felix**, and D. W. Shike. 2015. Effects of Maternal Plane of Nutrition During Mid-Gestation on Beef Calf Post-Weaning Growth and Feed Efficiency, Methane Production, Insulin Sensitivity, and Carcass Characteristics. *J. Anim. Sci.* 93(E-Suppl. 2):37.
7. Wilson, T. B., B. C. Ramírez, L. F. Rodriguez, A. R. Green, D. D. Boler, A. C. Dilger, **T. L. Felix**, and D. W. Shike. 2015. Effects of Maternal Plane of Nutrition During Late Gestation on Beef Calf Post-weaning Growth and Feed Efficiency, Methane Production, Insulin Sensitivity, and Carcass Characteristics. *J. Anim. Sci.* 93(E-Suppl. 2):176.

8. Kneeskern, S.G., A.C. Dilger, S.C. Loerch, D.W. Shike, and **T.L. Felix**. 2015. Effects of Cr supplementation during gestation on beef cow performance and the interaction with Cr during finishing on progeny growth performance and carcass characteristics. *J. Anim. Sci.* 93(E-Suppl. 2):189.
9. Edenburn, B.M., S.G. Kneeskern, B.M. Bohrer, W. Rounds, D.D. Boler, A.C. Dilger, and **T.L. Felix**. 2015. Effects of zinc, chromium, and beta-agonist supplementation on feedlot steers on growth performance, carcass characteristics, and meat quality. *J. Anim. Sci.* 93(E-Suppl. 2):169.

*Extension Reports/Publications*

1. **Felix, Tara L.** 2015. Use of alternative feeds for beef cattle. XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. March 19-20, 2015.
2. **Felix, Tara L.** 2015. Transitioning beef cattle from forage to grain. XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. March 19-20, 2015.
3. **Felix, Tara L.** 2015. Limit feeding strategies to optimize efficiency in beef cattle. XIX Curso: Novos Enfoques na Produção e Reprodução de Bovinos. March 19-20, 2015.

*Articles in the Popular Press (non-peer reviewed)*

1. **Felix, Tara L.** 2014. Corn co-products: Challenges and changes. *Progressive Dairyman*. Issue 3, February 7, 2014.

*Student theses and/or dissertations*

Chapple, Wesley, M.S., November 1, 2011 to December 14, 2014, "Utilization of chemically treated cornstalks and co-products to finish cattle", now at UIUC, Orr Agricultural Research and Development Center, Beef Farm Manager

Kneeskern, Samantha, In progress, August 16, 2013 to June 2015, "Effects of Cr Supplementation During Gestation on Beef Cow Performance and the Interaction with Cr During Finishing on Progeny Growth Performance and Carcass Characteristics", now at ASAS as Journalist Intern

Edenburn, Bailey, In progress, August 16, 2013 to September 2015, "Effects of Zinc, Chromium, and Beta-agonist Supplementation to Feedlot Steers on Growth Performance, Carcass Characteristics, and Meat Quality"

Kansas Publications:

Davis, C, D. Presley, J. Farney, G. Sassenthath. 2015. Evaluating multi-species cover crops for forage production. In: SEARC Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p.

Lomas, L. W. and J. L. Moyer. 2015. Effects of supplementation with corn or dried distillers grains on gains of heifer calves grazing smooth bromegrass pastures, pp. 33-34. In: SEARC

Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p.

<http://newprairiepress.org/kaesrr/vol1/iss4/12/>

Lomas, L. W. and J. L. Moyer. 2015. Evaluation of supplemental energy source for grazing stocker cattle, pp. 30-32. In: SEARC Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p.

<http://www.newprairiepress.org/kaesrr/vol1/iss4/11/>

Lomas, L. W. and J. L. Moyer. 2015. Effects of cultivar and distillers grains supplementation on grazing and subsequent finishing performance of stocker steers grazing tall fescue pasture, pp. 1-21. In: SEARC Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p. <http://www.newprairiepress.org/kaesrr/vol1/iss4/9/>

Lomas, L. W. and J. L. Moyer. 2015. Effects of various forage systems on grazing and subsequent finishing performance, pp. 22-29. In: SEARC Agricultural Research 2015. Kansas State Univ. Agric. Exp. Stn. and Coop. Extn. Serv., Manhattan, KS. 76p. <http://www.newprairiepress.org/kaesrr/vol1/iss4/10/>

Min, D. H. and J. L. Moyer. 2015. Establishing legumes in a tall fescue sward. Amer. J. Pl. Sci. 6:355-361. Doi.org.10.4236/ajps.2015.62040.

Moyer, J. L. and D. W. Sweeney. 2015. Responses of eastern gamagrass [*Tripsacum dactyloides* (L.) L.] forage quality to nitrogen application and harvest system. J. Plant Nutr. 38: (In Press).

Moyer, J. L., R. J. Whitworth, and H. Davis. 2014. Flaming dormant alfalfa for pest control. Amer. J. Pl. Sci. 5:915-923. Doi.org.10.4236/ajps.2014.57104.

Sweeney, D. W. and J. L. Moyer. 2014. Nitrogen timing, placement, and rate to improve tall fescue yield and quality. Online. Forage and Grazinglands doi:10.2134/FG-2014-0080-RS.

Nebraska

**Funding (include grants and contracts)**

*Source, amount, start/end dates, title of project, Project Director, Co-Project Director(s)*

1. Eng Foundation, \$100,000/year for 5 years, 2013-2018, Alternative Cow/calf Systems, Klopfenstein, Jenkins, Rasby
2. USDA-NIFA. \$497,000. 2013-2016. Grazing manage effect on micro- and macro-scale fate of carbon and nitrogen in rangelands. Mamo, Wyngeyer, Schacht, Volesky, Guretzky, Bradshaw, Ferguson.
3. Dept of Agriculture-NRCS. \$74,958. 2014-2016. Demonstrating soil health and economic benefits of cover crop adoption and livestock integration in Nebraska cropping systems. Drewnoski, Lesoing, Drijber, Shaver. USDA-NIFA-North Central Extension Risk Management Education Center. \$26,316. 2015-2016. Protecting Profits: Helping Nebraska Cattle Producers Manage Market Risk. Parsons, Brooks.



South Dakota

**Funding (include grants and contracts)**

*Source, amount, start/end dates, title of project, Project Director, Co-Project Director(s)*

- NC Extension Risk Management Exploratory Grants Program. \$2,495. March 1, 2015 – October 31, 2015. ***Novel business plans to promote crop/livestock integration on a landscape basis.*** PI: Roger Gates (Natural Resources). Co-PIs: Sandeep Kumar (Plant Science), Elaine Grings (Animal Science), Peter Sexton (Plant Science), Ruth Beck (Plant Science).
- SD NRCS Conservation Initiative Grant. \$74,994. September 1, 2014 - December 31, 2016. ***Demonstrating the short-term impacts of grazing cover crops on soil health.*** PI: Sandeep Kumar (Plant Science), Co-PIs: Eric Mbonimpa (Plant Science), Anthony Bly (Plant Science), Peter Sexton (Plant Science), Shaukat Ali (Plant Science), Douglas Malo (Plant Science), Bruce Bleakly (Biology and Microbiology), Elaine Grings (Animal Science).
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**Funding (include grants and contracts)**

Tara L Felix (PI) and Mike Cecava 2014	Nutritive value of biomass feedstuffs for livestock. ADM	\$11,411	\$11,411
Allen Bridges, Tara L. Felix (PI), Ryan Cox, Alfredo DiCostanzo, Eric Mousel, and Travis Meteer 2014-2016	Enhancing the feeding value of corn residues to improve beef cattle production. Minnesota Corn Research & Promotion Council	\$228,923	\$88,822