

## School of Natural Resource Sciences – 2014 Annual Report

### A. Significant Departmental achievements in research, teaching and outreach during the past year

#### a. Teaching

- Changes made since last report to enhance student learning to achieve the intended student learning outcomes for the curriculum.
  - For the first time, bylaws were created to govern the interdisciplinary Curriculum and Assessment Committee, and the Graduate Committee of the SNRS.
  - Faculty across the SNRS disciplines contributed to the development of Common Learning Outcomes and assessment strategies for the entire school.
  - Our 2014 Assessment Report received very high marks from the University Assessment Committee, which is now using it as a model for other departments.
  - Faculty from different academic programs in the SNRS worked together on several experiential learning activities, where students collaborated to write journal articles. These faculty were asked to lead discussions on these activities during a NDSU Pedagogical Luncheon.
  - In 2014, we started to align all of our School's disciplines (ENT, RNG, SOIL, NRM) so that the course schedules do not conflict. This information is now provided to all SNRS faculty to minimize conflicts.
  - Faculty across disciplines now advise NRM students.
- List new initiatives, innovative teaching approaches (providing evidence of quality improvements in teaching and learning).
  - All of the SNRS' undergraduate disciplines adopted a portfolio system in which students are provided a portfolio and populate the portfolio with examples of different learning outcomes throughout their undergraduate program.
  - For the first time, we now have one NRM/Range/Soils capstone course for all our undergraduate students. Dr. Hargiss is taking lead on this course, but will receive help from faculty of other disciplines of the School.
  - The first ever SNRS Research Symposium was held in 2014, highlighting the work of our different disciplines. It brought together faculty, staff, and students at the MU, and included a keynote presentation, and student seminars and posters.

#### b. Research/Scholarly/Creative Activities

- Major research accomplishments
  - The School's research productivity was up overall in 2014. Active grants were up by 9% from 2013 for a total of \$6,957,397 (value from Ag. Budget). There were ninety-two total graduate students advised by SNRS faculty, which was also up in 2014. The breakdown of graduate students by degree was 20 MNRM, 51 MS, and 21 PhD. Peer-reviewed publications also increased by 18% in 2014 for the previous year, where 72 faculty published.
- Significant additions to research capability
  - We hired Assistant Professor of Range Science, Dr. Torre Hovick, which completes our Range Science Program, and increasing the research potential of the discipline and SNRS.
  - We recently transitioned Dr. Christina Hargiss from Assistant Professor of Practice to a tenure track position in research and teaching. This transition will greatly benefit the research productivity of the School, and the NRM Program.

#### c. Extension/Outreach

- List new initiatives, innovative extension approaches
  - Activities of the Extension faculty have increased. The number of Extension programs planned went from 26 in 2013 to 36 in 2014, with approximately 2608 face-to-face contacts. Extension faculty also provided 129 presentations reaching over 10,000 people in-person.
  - Soil health agent training was initiated where five agents were brought to campus to participate

in a 2-day "pilot program". These agents play an integral role in developing and testing materials for more extensive soil health training of agents being offered in 2016.

d. Service

- Summarize state, national, or international professional service activities over the past year that are most noteworthy (for example: elected to lead national or international professional organization, organizing national or international professional meetings, etc.)
  - School faculty have established national and international reputations, where their expertise is being sought for a variety of services, such as grant review panels, editorial boards, external promotion and tenure evaluations, and manuscript reviews in the peer-review process. For example, in 2012, we had 7 faculty serve on editorial boards, and in 2014 there are now 11. During this same time frame, the manuscript reviews in the peer-review process went from 73 to 175. Faculty have also been awarded national awards in 2014, including (among others) Fellow in the Agronomy Society of America, Outstanding Young Professional in Society Range Management, and Excellence in Conservation Award for Soil and Water Conservation Society. Regionally, the visibility and reputation of School's faculty across the state has also increased. Several of the state's commodity requests for proposals have reflected the importance of research in the areas of the School's disciplines. In 2014, roughly one-third of the School's active grants came from commodity/livestock groups for approximately \$2 million. This was almost a 60% increase in commodity/livestock funding from the previous year.

B. Department Goals and Priorities for the past year, including narrative about progress toward those goals.

Of the goals that were established from last year, the following three were addressed:

- (1) Conduct a backwards audit of the School's courses  
A critical review of the courses was conducted and as a first step all the courses in the School were aligned so there were no schedule conflicts.
- (2) Increase undergraduate student engagement and learning  
We developed the idea of using a portfolio and incorporated it into the assessment of all the School's programs. Students will be able to populate the portfolio throughout their academic careers with examples from their classes that demonstrate specific learning outcomes (e.g. critical thinking, writing)
- (3) Pursue an innovative MNRM tuition model to gain resources  
A draft proposal was written and is under review.

C. Department Challenges for the past year, including narrative on how those are being addressed.

The School is still relatively new compared to more established programs in the university. The ongoing challenge is to develop synergies across disciplines. Efforts are made to foster synergies across the School's disciplines and between Extension and research faculty to provide solutions to complex problems. For example, when making requests (e.g. AES assistantships, revolving equipment funds), preference is placed on proposals that are interdisciplinary, or forming diverse committees, especially search committees. Also, when articulating goals for our curriculum discussions, an emphasis is placed on academic uniformity. Synergistic, integrated activities have emerged throughout the School for research and teaching.

D. Department Goals and Priorities for the Coming Year

- 1) Form bylaws for remaining SNRS committees;
- 2) Identify opportunities to meet needs of agricultural and natural resource stakeholders impacted by oil and gas;
- 3) Look for means to recruit and maintain high quality graduate students.

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**Appendix** (to be used for departmental and college records but not forwarded to Provost)

### I. Listing of active grants and contracts (Investigators, funding agency, total value)

<b>Principal Investigator</b>	<b>Funding Agency</b>	<b>Project Amount</b>
Boetel	Agriculture Research Service	\$3,300
Boetel	Beet Sugar Development Foundation	\$8,289
Boetel	Sugarbeet Res. & Edu. Board of MN & ND	\$60,050
Boetel	Sugarbeet Res. & Edu. Board of MN & ND	\$7,941
Casey	Agriculture Research Service	\$16,500
Casey	Agriculture Research Service	\$34,652
Casey	Agriculture Research Service	\$38,060
Casey	CSREES	\$393,297
Chatterjee	MN Wheat Research & Promotion Council	\$39,000
Chatterjee	MN Wheat Research & Promotion Council	\$32,850
Chatterjee	ND Corn Utilization Council	\$20,290
Chatterjee	ND Corn Utilization Council	\$25,530
Chatterjee	ND Corn Utilization Council	\$8,950
Chatterjee	ND Corn Utilization Council	\$4,300
Chatterjee	ND Soybean Council	\$14,940
Chatterjee	ND Soybean Council	\$8,400
Chatterjee	ND Soybean Council	\$8,463
Chatterjee	ND Soybean Council	\$17,285
Chatterjee	Sugarbeet Res. & Edu. Board of MN & ND	\$88,580
Chatterjee	Sugarbeet Res. & Edu. Board of MN & ND	\$52,950
Chatterjee	Koch Agronomic Services, LLC	\$9,682
Chatterjee	Northern Pulse Growers Association	\$6,575
Cihacek	ND Corn Utilization Council	\$26,250
Cihacek	ND Department of Health	\$33,616
DeKeyser	Forest Service	\$52,156
DeKeyser	Natural Resources Conservation Service	\$16,600
DeKeyser	ND University System Office	\$21,023
DeKeyser	Red River Regional Planning Council	\$22,222
DeKeyser	U.S. Fish and Wildlife Service	\$97,508
DeKeyser	U.S. Geological Survey	\$13,224
DeSutter	Forest Service	\$0
DeSutter	Natural Resources Conservation Service	\$294,264
DeSutter	Natural Resources Conservation Service	\$465,413
DeSutter	Natural Resources Conservation Service	\$75,000
DeSutter	ND Soybean Council	\$70,299
DeSutter	ND Water Commission	\$2,050
DeSutter	U.S. Geological Survey	\$11,400
DeSutter	University of Minnesota	\$18,000
DeSutter	Tesoro Logistics Operations, LLC	\$299,394
Fortuna	ND Soybean Council	\$4,043
Fortuna	NIFA	\$226,789
Fortuna	NIFA	\$275,971

Fortuna	NIFA	\$190,307
Fortuna	NIFA	\$43,177
Fortuna	NIFA	\$23,923
Fortuna	U.S. Geological Survey	\$5,350
Foster	Agriculture Research Service	\$236,615
Foster	Agriculture Research Service	\$45,000
Franzen	National Science Foundation	\$120,235
Franzen	National Sunflower Association	\$54,488
Franzen	ND Corn Utilization Council	\$51,860
Franzen	ND Corn Utilization Council	\$103,994
Franzen	Pioneer Hi-Bred International Inc.	\$20,400
Franzen	BASF Wyandotte Corporation	\$57,970
Goos	ND Soybean Council	\$6,030
Goos	ND Soybean Council	\$6,620
Goos	Tessenderlo-Kerley, Inc	\$7,225
Goos	Tessenderlo-Kerley, Inc	\$7,250
Goos	ND Wheat Commission	\$6,750
Hargiss	ND Department of Health	\$42,688
Harmon	National Science Foundation	\$320,125
Harmon	National Science Foundation	\$43,161
Harmon	ND Corn Utilization Council	\$40,801
Harmon	ND Soybean Council	\$127,235
Harmon	ND Soybean Council	\$7,070
Harris	Purdue University	\$20,599
Harris	ND Wheat Commission	\$2,500
Limb	Forest Service	\$10,000
Limb	Forest Service	\$45,000
Limb	University of North Dakota	\$200,000
Limb	KDK Consulting	\$16,000
McGranahan	ND Soybean Council	\$56,054
Norland	Alliance Pipeline, L.P.	\$70,000
Rider	National Science Foundation	\$163,441
Rider	ND Department of Agriculture	\$500
Rider	ND Department of Agriculture	\$9,450
Sedivec	Forest Service	\$178,984
Sedivec	Forest Service	\$77,000
Sedivec	Forest Service	\$17,662
Sedivec	Little Missouri Grazing Association	\$14,000
Sedivec	McKenzie County Grazing Association	\$30,000
Sedivec	Medora County Grazing Association	\$30,000
Sedivec	Montana State University	\$4,506
Sedivec	ND Department of Health	\$157,343
Sedivec	ND National Guard	\$1,400
Sedivec	ND National Guard	\$2,412
Sedivec	ND National Guard	\$2,568
Sedivec	ND National Guard	\$3,000
Sedivec	ND National Guard	\$5,500
Sedivec	ND National Guard	\$6,015
Sedivec	ND National Guard	\$6,114

Sedivec	ND National Guard	\$7,864
Sedivec	ND National Guard	\$9,000
Sedivec	ND National Guard	\$9,760
Sedivec	ND National Guard	\$9,894
Sedivec	ND National Guard	\$8,796
Sedivec	ND National Guard	\$0
Sedivec	ND National Guard	\$15,231
Sedivec	ND National Guard	\$6,188
Sedivec	ND National Guard	\$16,401
Sedivec	ND National Guard	\$10,660
Sedivec	ND National Guard	\$5,674
Sedivec	ND National Guard	\$1,885
Sedivec	NIFA	\$146,696
Voldseth	Agriculture Research Service	\$11,545
Voldseth	National Sunflower Association	\$16,581
Voldseth	ND Soybean Council	\$17,086
Voldseth	ND Soybean Council	\$39,717
Voldseth	ND University System Office	\$34,130
Voldseth	South Dakota State University	\$20,000
Voldseth	University of Wisconsin	\$2,990
Voldseth	Monsanto Co.	\$15,536
Wick	ND Corn Utilization Council	\$4,800
Wick	ND Corn Utilization Council	\$53,219
Wick	ND Corn Utilization Council	\$68,950
Wick	ND Corn Utilization Council	\$31,739
Wick	ND Corn Utilization Council	\$64,192
Wick	ND Corn Utilization Council	\$62,707
Wick	ND Department of Health	\$30,000
Wick	ND Department of Health	\$70,269
Wick	ND Soybean Council	\$58,213
Wick	ND Soybean Council	\$2,300
Wick	ND Soybean Council	\$56,485
Wick	ND Soybean Council	\$33,582
Wick	ND Wheat Commission	\$27,719
Zelevnik	Agriculture Research Service	\$4,160
<b>Grand Total</b>		<b>\$ 6,597,397.00</b>

## II. Publications and presentations (use format that is common for the discipline)

### 1. Refereed Journal articles (72)

<b>Refereed Journal Articles - 72</b>
Abbott, KC, JP Harmon, and NS Fabina. 2014. The challenge of predicting temperature effects on short-term predator-prey dynamics. <i>Population Ecology</i> 56:375-392
Aggarwal, R., Subramanyam, S., Zhao, C., Chen, M-S. Harris, M.O., and Stuart, J.J. 2014. Avirulence effector discovery in a plant galling and plant parasitic arthropod, the Hessian fly ( <i>Mayetiola destructor</i> ). <i>PLoS ONE</i> 9: e100958.
Allred, B.W, J.D. Scasta, T.J. Hovick, and S.D Fuhlendorf. 2014. Spatial Heterogeneity Stabilizes Livestock Productivity in a Changing Climate. <i>Agriculture, Ecosystems and Environment</i> 193:37-41.

Amarakoon, D., D. Thavarajah, D.S. Gupta, K. McPhee, T. DeSutter, and P. Thavarajah. J. Food Comp. Anal. 37:67-74. ( <i>Accepted for publication.</i> )
Andersson, M.N., Videvall, E., Walden, K.O., Harris, M.O., Robertson, H.M. and Löfstedt, C. 2014. Sex- and Tissue-Specific Profiles of Chemosensory Gene Expression in a Herbivorous Gall-Inducing Fly (Diptera: Cecidomyiidae). <i>BMC Genomics</i> 15: 501.
Bai X.L., Shrestha S.L., Casey F.X.M., Hakk H., Fan Z.S. 2014. Modeling coupled sorption and transformation of 17 beta-estradiol-17-sulfate in soil-water systems. <i>Journal of Contaminant Hydrology</i> 168:17-24. DOI: DOI 10.1016/j.jconhyd.2014.09.001.
Bai, X., F.X.M. Casey, H. Hakk, T.M. DeSutter, P.G. Odour, E. Khan. Sorption and metabolism of 17 $\beta$ -estradiol-17-sulfate in sterilized soil-water systems. <i>Chemosphere</i> doi:10.1016/j.chemosphere.2014.02.016. ( <i>Accepted for publication.</i> )
Barth, C.J., M.A. Liebig, J.R. Hendrickson, K.K. Sedivec, and G. Halvorson. 2014. Soil Change Induced by Prairie Dogs across Three Ecological Sites. <i>Soil Sci. Soc. Am. J.</i> 78:2054–2060.
Brunner, S. M., R. J. Goos, S. J. Swenson, S. P. Foster, B. G. Schatz, Y. E. Lawley and D. A. Prischmann-Voldseth. Impact of nitrogen fixing and plant growth-promoting bacteria on a phloem-feeding soybean herbivore. <i>Applied Soil Ecology</i> 86: 71-81. ( <i>Accepted for publication.</i> )
Burdick SC, Prischmann-Voldseth DA, Harmon JP. Density and distribution of soybean aphid, <i>Aphis glycines</i> Matsumura (Hemiptera: Aphididae) in response to UV radiation. <i>Pop. Ecol. (In Press.)</i>
Carvajal, M. A. 2014. Primer registro de <i>Sinopla humeralis</i> Signoret, 1864 (Hemiptera: Heteroptera: Acanthosomatidae) para Argentina. <i>Anales del Instituto de la Patagonia</i> 42(1):87-88.
Carvajal, M. A., E. I. Faundez, and D. A. Rider. 2014. New data on the genus <i>Ea</i> Distant, 1911 (Hemiptera: Heteroptera: Acanthosomatidae), with description of a new species from Chile. <i>Anales Instituto Patagonia</i> 42(2):53-58.
Chambers, K.B., F.X. Casey, H. Hakk, T.M. DeSutter, and N.W. Shappell. 2014. Potential bioactivity and association of 17- $\beta$ estradiol with the dissolved and colloidal fractions of manure and soil. <i>Sci. Tot. Env.</i> 494:58-64.
Chatterjee, A., B. Geaumont, T. DeSutter, D. Hopkins, M. Rakkar. Rapid Shifts in Soil CO <sub>2</sub> Efflux within Sodic Landscapes. <i>Arid Land Research &amp; Management</i> , 29:255-263. ( <i>Accepted for publication.</i> )
Chen, Y., S.D. Day, A.F. Wick, K.J. McGuire. 2014. Influence of Urban Land Development and Subsequent Soil Rehabilitation on Soil Aggregates, Carbon and Hydraulic Conductivity. <i>Science of the Total Environment</i> 494-495:329-336.
Cihacek, L. J., L A. Foss and K. A. Jacobson. 2015. A comparison of soil sampling devices for soil bulk density determination for carbon sequestration monitoring. <i>Commun. Soil Sci. Plant Anal.</i> 46(2):180-184. ( <i>Published online 31 December 2014.</i> )
Daigh, A.L., M.C. Savin, K.R. Brye, R. Norman, and D. Miller. 2014. Urea persistence in floodwater and soil used for flooded rice production. Submitted to <i>Soil Use and Management</i> . <i>Soil Use and Management</i> . Doi:10.1111/sum.12142.
Daigh, A.L., M.J. Helmers, E. Kladivko, X. Zhou, R. Goeken, J. Cavadini, D. Barker, and J. Sawyer. 2014. Soil water during the drought of 2012 as affected by rye cover crops in fields in Iowa and Indiana. <i>Journal of Soil and Water Conservation</i> . 69:564-573.
Daigh, A.L., T. Sauer, X. Xiao, and R. Horton. Comparison of soil temperature- and water content-based models for determining soil-surface CO <sub>2</sub> effluxes in different agricultural systems. <i>Agron. J.</i> <i>Accepted.</i>
Daigh, A.L., T. Sauer, X. Xiao, and R. Horton. 2014. Soil-surface CO <sub>2</sub> emission spatial and temporal dynamics in corn rotations and reconstructed prairies. <i>Soil Sci. Soc. Am. J.</i> 78:1338-1350.
Daigh, A.L., X. Zhou, M.J. Helmers, C.H. Pederson, R. Horton, and R. Ewing. 2014. Subsurface drainage flow and soil water dynamics of reconstructed prairies and corn rotations for biofuel production. <i>Vadose Zone J.</i> doi:10.2136/vzj2013.10.0177.
Faundez, E. I. 2014. A new genus for a Chilean species of Acanthosomatidae (Hemiptera: Heteroptera). <i>Zootaxa</i> 3768(5):596-600.

Faundez, E. I. and D. A. Rider. 2014. Nuevos registros de Pentatominae Leach, 1815 en Chile (Hemiptera: Heteroptera: Pentatomidae). <i>Boletín de la Sociedad Entomológica Aragonesa</i> 55:159-162.
Faundez, E. I. and D. A. Rider. 2014. <i>Thestral incognitus</i> , a new genus and species of Pentatomidae from Chile (Heteroptera: Pentatomidae: Pentatominae: Carpocorini). <i>Zootaxa</i> 3884(4):394-400.
Faundez, E. I. and M. A. Carvajal. 2014. Bed bugs are back and also arriving is the southernmost record of <i>Cimex lectularius</i> (Heteroptera: Cimicidae) in South America. <i>Journal of Medical Entomology</i> 51(5):1073-1076.
Faundez, E. I. and M. A. Carvajal. 2014. Contribucion al conocimiento del complejo de <i>Nabis punctipennis</i> Blanchard, 1852 (Hemiptera: Heteroptera: Nabidae) en Chile. <i>Anales del Instituto de la Patagonia</i> 42(1):63-69.
Faundez, E. I., D. A. Rider, and M. A. Carvajal. 2014. A new species of <i>Acledra</i> s. str. (Hemiptera: Heteroptera: Pentatomidae) from the highlands of Argentina and Bolivia, with a checklist and key to the species of the nominate subgenus. <i>Zootaxa</i> 3900(1):127-134.
Faundez, E. I., D. A. Rider, and M. A. Carvajal. 2014. <i>Cochabambia</i> Piran, 1959 (Hemiptera: Heteroptera: Acanthosomatidae), a senior homonym of <i>cochabambia</i> Marcuzzi, 1985 (Coleoptera: Tenebrionidae), with notes on the placement of <i>Cochabambia</i> Piran. <i>Zootaxa</i> 3793(5):595-596.
Faundez, E. I., M. A. Carvajal, and A. C. Ashworth. 2014. Una nueva especie de <i>Idiostolus</i> Berg, 1883 (Hemiptera: Heteroptera: Idiostoloidea: Idiostolidae). <i>Anales del Instituto de la Patagonia</i> 42(1):71-75.
Faundez, E. I., M. A. Carvajal, and D. A. Rider. 2014. <i>Archaeoditomotarsus crassitylus</i> , gen. and sp. nov. (Hemiptera: Heteroptera: Acanthosomatidae) from Chile. <i>Zootaxa</i> 3860(1):87-91.
Foster SF, K Anderson, JP Harmon. 2014. Increased allocation of adult-acquired carbohydrate to egg production results in its decreased allocation to sex pheromone production in mated females of the moth <i>Heliothis virescens</i> . <i>Journal of Experimental Biology</i> 217:499-506.
Ghahari, H., P. Moulet, and D. A. Rider. 2014. An annotated catalog of the Iranian Pentatomoidea (Hemiptera: Heteroptera: Pentatomomorpha). <i>Zootaxa</i> 3837(1):1-95.
Goos, R. J, N. Abdraimova, and B.E. Johnson. A method for determination of ureides in soybean tissues. <i>Communications in Soil Science and Plant Analysis (Available online, print page numbers not issued yet)</i> .
Hakk H., Sikora L., Casey F.X.M., Larsen G.L. 2014. Fate of 17 $\beta$ -Estradiol in Anaerobic Lagoon Digesters. <i>Journal of Environmental Quality</i> 43:701-708. DOI: DOI 10.2134/jeq2013.06.0245.
Hargiss, C.L.M. and E.S. DeKeyser. 2014. The Challenges of Conducting Environmental Research on Privately Owned Land. <i>Environmental Monitoring and Assessment</i> 186(2): 979-985.
Harris, M.O., T.L. Friesen, S.S. Xu, M.S. Chen, D. Giron, and J.J. Stuart. 2014. Pivoting from <i>Arabidopsis</i> to wheat to understand how agricultural plants integrate responses to biotic stress. <i>Journal of Experimental Botany</i> doi:10.1093/jxb/eru465.
He Y., DeSutter T., Casey F., Clay D., Franzen D., Steele D. Field capacity water as influenced by Na and EC: Implications for subsurface drainage. <i>Geoderma</i> 245–246:83-88. DOI: <a href="http://dx.doi.org/10.1016/j.geoderma.2015.01.020">http://dx.doi.org/10.1016/j.geoderma.2015.01.020</a> . (Accepted for publication.)
He, Y., T.M. DeSutter, D.G. Hopkins, D. Wysocki, D. Clay. The relationship between SAR1:5 and SARE of soil to water extract. <i>Soil Sci. Soc. Am. J.</i> (Accepted for publication.)
Hovick, T.J., R.D. Elmore, and S.D. Fuhlendorf. 2014. Structural Heterogeneity Increases Diversity of Non-breeding Grassland Birds. <i>Ecosphere</i> 5: <a href="http://dx.doi.org/10.1890/ES14-00062.1">http://dx.doi.org/10.1890/ES14-00062.1</a>
Hovick, T.J., R.D. Elmore, B.W Allred, S.D. Fuhlendorf, and D.K. Dahlgren. 2014. Landscapes as a Moderator of Thermal Extremes: A Case Study from an Imperiled Grouse. <i>Ecosphere</i> 5: <a href="http://dx.doi.org/10.1890/ES13-00340.1">http://dx.doi.org/10.1890/ES13-00340.1</a>
Hovick, T.J., R.D. Elmore, D.K. Dahlgren, S.D. Fuhlendorf, and D.M. Engle. 2014. Evidence of Negative Effects of Anthropogenic Structures on Wildlife: A Review of Grouse Behavior and Survival. <i>Journal of Applied Ecology</i> 51:1680-1689.
Hovick, T.J., R.D. Elmore, S.D. Fuhlendorf, and D.K. Dahlgren. Climate Constrains Effects of Land-use for Nesting Greater Prairie-Chickens. <i>Rangeland Ecology and Management</i> . (Accepted.)

Hovick, T.J., R.D. Elmore, S.D. Fuhlendorf, D.M. Engle, and R. G. Hamilton. 2014. Spatial Heterogeneity Increases Diversity and Stability in Grassland Bird Communities. <i>Ecological Applications</i> . <a href="http://dx.doi.org/10.1890/14-1067.1">http://dx.doi.org/10.1890/14-1067.1</a>
Huzurbazar, S., C. Gasch, A.F. Wick, S. Rana-Dangi, P.D. Stahl. Assessing Impacts of Crested Wheatgrass versus Native Species Establishment on Soil Characteristics in Two Reclamation Chronosequences Using Bayesian Posterior Predictive Distributions. <i>Soil Science Society of America Journal</i> . ( <i>Accepted for publication</i> .)
Kment, P., Z. Jindra, and D. A. Rider. 2014. New synonymies and new records of Afrotropical and Madagascan Pentatominae (Hemiptera: Heteroptera: Pentatomidae). <i>Zootaxa</i> 3866(3):371-397.
Koch, R. L., D. A. Rider, P. P. Tinerella, and W. A. Rich. Stink bugs (Hemiptera: Heteroptera: Pentatomidae) of Minnesota: An annotated checklist and new state records. <i>Great Lakes Entomologist</i> . ( <i>In press or accepted</i> .)
Kolka, R., S. Fraver, P. Townsend, B. Sturtevant, P. Wolter, J. Miesel, and T. DeSutter. 2014. Forest floor and upper soil canopy carbon, nitrogen and mercury pools shortly after fire and comparisons to fire severity indices. <i>Soil Sci. Soc. Am. J.</i> 78:S58-S65.
Limb, R.F., D.M. Engle, A.L. Alford, and E.C. Hellgren. 2014. Plant community response following removal of <i>Juniperus virginiana</i> from tallgrass prairie: A test of restoration limitations. <i>Rangeland Ecology and Management</i> 67:397-405.
Mamidi, S, R. K. Lee, R. J. Goos, and P. McClean. 2014. Genome-Wide Association Studies Identifies Seven Major Regions Responsible for Iron Deficiency Chlorosis in Soybean ( <i>Glycine max</i> ). <i>PLOS One</i> . DOI: 10.1371/journal.pone.0107469.
McCarville MT, O'Neal ME, Potter BD, Tilmon KJ, Cullen EM, McCornack BP, Tooker JF, Prischmann-Voldseth DA. 2014. One gene versus two: a regional study on the efficacy of single gene versus pyramided resistance for soybean aphid management. <i>J. Econ. Ent.</i> 107: 1680-1687.
McGranahan, DA, AL Daigh, JJ Veenstra, DM Engle, JR Miller, DM Debinski. 2014. Connecting soil organic carbon and root biomass with land-use and vegetation in temperate grassland. <i>Scientific World Journal</i> vol. 2014, Art ID 487563, 9 pp.
McGranahan, DA, CB Henderson, JS Hill, GM Raicovich, WN Wilson, CK Smith. 2014. Patch-burning improves forage quality, creates grass-bank in old-field pasture: Results of a demonstration trial. <i>Southeastern Naturalist</i> 13:200–207.
McGranahan, DA, DM Engle, JT Mulloy, JR Miller, DM Debinski. 2014. Land-use history and an invasive grass affect tallgrass prairie sedge community composition. <i>Applied Vegetation Science</i> . ( <i>In press</i> .)
McGranahan, DA. 2014. Ecologies of scale: Multifunctionality connects conservation and agriculture across fields, farms, and landscapes. <i>Land</i> 3:739–769. Invited special issue.
McMullen, R.L., K.R. Brye, A.L. Daigh, D.M. Miller, E.E. Gbur, A.L. Pirani, M.A. Evans-White, and R.E. Mason. 2014. Long-term leachate water quality trends from a broiler litter-amended Udult in a karst region. <i>Vadose Zone J.</i> doi:10.2136/vzj2014.06.0064.
McMullen, R.L., K.R. Brye, D.M. Miller, R.E. Mason, A.L. Daigh, B.C. Menjoulet, A.L. Pirani, E.E. Gbur, and M.A. Evans-White. 2014. Long-term runoff water quality as affected by broiler-litter application to a udult in the Ozark Highlands. <i>Soil Sci. Soc. Am. J.</i> doi:10.2136/sssaj2014.07.0291.
Meisner MH, JP Harmon, and AR Ives. 2014. Temperature effects on long-term population dynamics in a parasitoid-host system. <i>Ecological Monographs</i> 84:457-476.
Meyers L., E. DeKeyser, and J. Norland. 2014. Differences in spatial autocorrelation (Sac), plant species richness and diversity, and plant community composition in grazed and ungrazed grasslands along a moisture gradient, North Dakota, U.S.A. <i>Applied Vegetation Science</i> 17:53-62.
Oikawa, P. Y., D. A. Grantz, A. Chatterjee, J. E. Eberwein, L. A. Allsman and G. D. Jenerette. 2014. Unifying soil respiration pulses, inhibition, and temperature hysteresis through dynamics of labile soil carbon and O <sub>2</sub> . <i>J. Geophys. Res. Biogeosci.</i> doi: 10.1002/2013JG002434.

Rahman, A., S. Rahman, and L. Cihacek. 2014. Influence of soil pH in vegetative filter strips to reduce soluble nutrients transport. <i>Environ. Tech.</i> 35(14):1744-1752.
Rahman, M.M., Z. Lin, X. Jia, D.D. Steele, and T.M. DeSutter. 2014. Impact of subsurface drainage on streamflows in the Red River of the North basin. <i>J. Hydrol.</i> 511:474-483.
Rand, T.A., D.K. Waters, S.L. Blodgett, J.J. Knodel, and M.O. Harris. 2014. Herbivore response to increased area of a preferred crop results in higher pest pressure in intensified agricultural landscapes. <i>Agriculture Ecosystems and Environment</i> 186: 135-143.
Rider, D. A. and H. Brailovsky. 2014. Pentamymexini, a new tribe for <i>Pentamymex spinosus</i> , a remarkable new genus and species of Pentatomidae (Hemiptera: Heteroptera) from Thailand. <i>Zootaxa</i> 3895(4):595-600.
Sharma, L.K., H. Bu, and D.W. Franzen. COMPARISON OF TWO GROUND-BASED ACTIVE-OPTICAL SENSORS FOR IN-SEASON ESTIMATION OF CORN ( <i>ZEAMAYS</i> , L.) YIELD. <i>Journal of Plant Nutrition</i> . (Accepted for publication, October, 2014.)
Solga, MJ, JP Harmon, and AC Ganguli. 2014. Timing is everything: An overview of phenological changes to plants and their pollinators. <i>Natural Areas Journal</i> 34:227-234.
Steele, D.D., B.P. Thoreson, D.G. Hopkins, B.A. Clark, S.R. Tuscherer, and R. Gautam. Spatial mapping of evapotranspiration over Devils Lake basin with SEBAL: Application to flood mitigation via irrigation of agricultural crops. <i>Irrig. Sci.</i> 33(1):15-29. DOI: 10.1007/s00271-014-0445-1. (Accepted 09 Sept 2014; published online 30 Sept 2014.)
Strand, E.K., K.L. Launchbaugh, R. Limb, and L.A. Torell. 2014. Livestock grazing effects on fuel loads for wildland fire in sagebrush dominated ecosystems. <i>Journal of Rangeland Applications</i> 1:35-57.
Swenson SJ, Andres B, Prischmann-Voldseth DA. 2014. Reproduction of soybean aphid (Hemiptera: Aphididae, <i>Aphis glycines</i> Matsumura) on clover ( <i>Trifolium</i> spp.). <i>J. Kansas Ent. Soc.</i> 87: 253-257.
Viall E.W., L.F. Gentry, D.G. Hopkins, A.C. Ganguli, and P.D. Stahl. 2014. Legacy effects of oil road reclamation on soil biology and plant community composition. <i>Journal of Restoration Ecology</i> , 22 (5) 625-632. Article first published online: June 18, 2014; DOI: 10.1111/rec.12115.
Wick, A.F., W.L. Daniels, W.L. Nash and J.A. Burger. 2014. Aggregate Recovery in Reclaimed Coal Mine Soils in SW Virginia. <i>Land Degradation and Development</i> .
Yarwood, S., A.F. Wick, M. Williams, W.L. Daniels. Parent Material and Vegetation Influence on Soil Microbial Community Structure following 30-years of Rock Weathering and Pedogenesis. <i>Microbial Ecology</i> . (Accepted for publication.)
Zitnick-Anderson, K.K., J. E. Norland, L. del Rio, A.-M. Fortuna, and B. Nelson. 2014. Soil properties associated with the presence of <i>Pythium</i> communities in soybean roots. <i>Phytopathology</i> . 104:S3.138.

## 2. Abstracts (63)

<b>Abstracts - 63</b>
Bhowmik, A. and A.-M. Fortuna. 2014. Managing nitrogen in long-term organic agroecosystems. 2014 International Prairie Student Conference, August 6-8, 2014.
Bhowmik, A., A.-M. Fortuna, L.J. Cihacek and P. Carr. 2014. Managing Reactive Nitrogen in Long Term Clean till and No till Organic Agroecosystems. SSSA, Long Beach, CA.
Birru, G., D.D. Malo, D.E. Clay, C.L. Reese, C.G. Carlson, S.A. Clay, T.M. DeSutter, T.P. Kharel, and R.K. Owen. 2014. Reclamation of sodic soil and improving crop yield in northern Great Plains soils. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Butcher, K. A.F. Wick, T. DeSutter, J. Harmon, D. Prischmann-Voldseth. 2014. Soybean Growth Responses to Natural Soil Salinity Gradients in Richland County, North Dakota. Science Society of America National Meeting, November 3-5, Long Beach, CA.

Calderon, F. J., A. M. Fortuna, H. Matthees-Dose, L. J. Cihacek, K. Anderson, T. M. De Sutter, and J. Bell. 2014. Using infrared spectroscopy to predict soil health indicators. Abst. No. 149-3. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014. Long Beach, CA.
Calderon, F.J., A.-M. Fortuna, H. Matthees-Dose, L.J. Cihacek, K.A. Anderson, T.M. DeSutter and J. Bell. 2014. Soil Health in sodic soils is determined by a suite of indicators that include several chemical, physical, and biological properties. SSSA, Long Beach, CA.
Calles Torrez, V., J.J. Knodel, M.A. Boetel, and P. Beauzay. 2014. Corn rootworms in North Dakota: a state-wide survey and a comparison of sticky traps for monitoring adult activity. Abstracts of the Entomological Society of America, annual meeting, Paper no. D3111.
Cihacek, L. J., M. Ulmer, and E. Kraft. 2014. Temporal soil carbon change in the northern Great Plains of the U. S. Abst. No. 425-17. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014. Long Beach, CA.
Creuzer, J., C.L.M. Hargiss, J.E. Norland, T.E. DeSutter, E.S. DeKeyser, and F. Casey. 2014. Road Dust: Impacts of Increased Travel from Energy Development in Western North Dakota. Sustaining the Blue Planet Conference. Bozeman, MT.
Creuzer, J., C.L.M. Hargiss, J.E. Norland, T.E. DeSutter, E.S. DeKeyser, and F. Casey. 2014. Increased Travel and Energy Development: What is the Effect on Wetlands in Western North Dakota? Northern Plains Biological Symposium. Fargo, ND.
Creuzer, J., C.L.M. Hargiss, J.E. Norland, T.E. DeSutter, E.S. DeKeyser, and F. Casey. 2014. Energy Development and Increased Travel in North Dakota: What is the Effect on Wetlands? Joint Aquatic Sciences Meeting. Portland, OR.
Creuzer, J., C.L.M. Hargiss, J.E. Norland, T.E. DeSutter, E.S. DeKeyser, and F. Casey. 2014. The Impacts of Increased Road Use and Dust on Wetlands in Western North Dakota. ND Water Quality Monitoring Conference. Bismarck, ND.
Daigh, A., A. Wick, and M. Langseth. 2014. Soil health as affected by land conversion on the Northern Plains. Soil Management Impacts on Soil Properties and Soil C and N Dynamics:II. Soil and Water Management and Conservation. In <i>Annual Meetings Abstracts</i> . ASA, CSSA, and SSSA, Madison, WI.
Daigh, A., A.F. Wick, M. Langseth. 2014. Documenting the Transition to No-till on the Northern Plains. Science Society of America National Meeting, November 3-5, Long Beach, CA.
DeKeyser, E.S., L.M. Meyers, J.E. Norland, C. Hargiss, and T. DeSutter. 2014. The National Wetland Condition Assessment in North Dakota: Preliminary Results. ND Water Quality Monitoring Conference. Bismarck, ND.
Derby, N.E., A. F. Wick, F.X.M. Casey. 2014. Spatially Variable Soil Salinity, Chemistry, and Physical Properties Affect Soil Health. Science Society of America National Meeting, November 3-5, Long Beach, CA.
Eichele, J., J.P. Harmon, D.A. Prischmann-Voldseth, C. Heglund, A.F. Wick, J. Dreyer. 2014. Two-spotted spider mites ( <i>Tetranychus urticae</i> ) perform better on soybean plants grown in saline conditions Annual Meeting of the North Central Branch of the Entomological Society of America, March, Des Moines, IA.
Franzen, D. 2014. Active optical sensor algorithms for corn yield prediction and in-season N application in North Dakota. International Conference on Precision Agriculture, Sacramento, CA. July 20-23.
Franzen, D.W., L. Sharma, H. Bu. 2014. Ground-based active-optical sensor algorithms for corn ( <i>Zea mays</i> L.) in North Dakota. ASA-SSSA-CSSA meetings, Nov. 2-5, Long Beach, CA.
Halberg, T. and K.K. Sedivec. 2014. AN ECOLOGICAL SITE DESCRIPTION OF BUR OAK ( <i>QUERCUS MACROCARPA</i> ) COMMUNITIES IN THE NORTHERN PLAINS. Society for Range Management – 67 <sup>th</sup> Annual International meetings, Orlando, FL.
Hargiss, C.L.M. 2014. Inspired Environmental Education. Sustaining the Blue Planet Conference. Bozeman, MT.

He, Y., T.M. DeSutter, F.X.M. Casey, L.J. Cihacek, D.E. Clay, D. Franzen, and D.D. Steele. 2014. Behaviors of Na-affected soils: Implications for subsurface drainage. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Heglund, C.M, A.F. Wick. 2014. Development of a Soil Health Demonstration Network in North Dakota. Soil Science Society of America National Meeting, November 3-5, Long Beach, CA.
Hovick, T.J., R.D. Elmore, and S.D. Fuhlendorf. 2014. Structural Heterogeneity Increases Avian Diversity and Stability in Tallgrass Prairie. American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologist's Joint Meeting. Estes Park, CO. September, 2014.
Kharel, T.P., D.E. Clay, T.M. DeSutter, D.D. Malo, C.G. Carlson, and C.L. Reese. 2014. Chemical amendments for sodium leaching in saline-sodic soils. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Klopp, H. and A.L. Daigh. 2014. Salinity and sodicity effects on soil water retention and transport. Environmental Soil Physics and Hydrology Student Competition: Lightning Orals with Poster Presentation. <i>In Annual Meetings Abstracts</i> . ASA, CSSA, and SSSA, Madison, WI.
Kolka, R.K., B. Sturtevant, J. Miesel, P. Townsend, P. Wolter, S. Fraver, and T. DeSutter. 2014. Post fire forest floor fire severity index relationships with soil mercury pools. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Kral, K.C., K.K. Sedivec, A. Gearhart. 2014. EFFECTS OF EARLY SPRING WILDFIRE ON CRESTED WHEATGRASS DOMINATED PASTURELAND AND RANGELAND OF SOUTH DAKOTA. Society for Range Management – 67 <sup>th</sup> Annual International meetings, Orlando, FL.
Link, A. and E.S. DeKeyser. 2014. Northern tallgrass rangeland restoration through interseeding native plants. February. International meeting of the Society for Range Management. February. Orlando, FL.
Lipinski, A.R., K.K. Sedivec, and B. Geaumont. 2014. INTERACTIONS AMONG RANGELAND VEGETATION, BLACK-TAILED PRAIRIE DOG COLONIES, AND GRASSLAND AVIFAUNA IN NORTHERN SOUTH DAKOTA. Society for Range Management – 67 <sup>th</sup> Annual International meetings, Orlando, FL.
Lokumana, C., S. Foster, J. Prasifka. 2014. Isolation of volatile constituents of cultivated sunflower, <i>Helianthus annuus L.</i> Poster at International Society of Chemical Ecology, Champaign-Urbana, IL, July 2014. (won best student poster competition)
MacRae, I., and M. Boetel. 2014. Canopy spectral reflectance: A potential monitoring tool for sugarbeet root maggot, <i>Tetanops myopaeformis</i> . Abstracts of the Entomological Society of America, annual meeting. Paper no. D3309.
Matthees-Dose, H. L., A. M. Fortuna, L. J. Cihacek, J. Norland, T. M. DeSutter, J. Bell, and D. Clay. 2014. Identifying soil health indicators for management of a sodic soil. Abst. No. 314-25. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014.
Matthees-Dose, H.L., A.-M. Fortuna, E. Eberle, R.J. Goos, J. Teboh. 2014. Impact of crop rotation, tillage system and nitrogen availability on biological nitrogen fixation in soybeans. Annual Meeting North Central Branch of the American Society for Microbiology, Superior, WI.
Meehan M.A., K. K. Sedivec, and J.L. Printz. 2014. NORTH DAKOTA RIPARIAN ECOLOGICAL SITE DESCRIPTION DEVELOPMENT PROJECT. Society for Range Management – 67 <sup>th</sup> Annual International meetings, Orlando, FL.
Meyers, L., E.S. DeKeyser, J. Norland, C. Hargiss, T. DeSutter. 2014. The NWCA Intensification in North Dakota. Joint Aquatic Sciences Meeting, Portland, OR.
Meyers, L.M., E.S. DeKeyser, J.E. Norland, C. Hargiss, T. DeSutter, and S. Gabel. 2014. Plant Phosphorus, Nitrogen, and Carbon and Soil Phosphorus in North Dakota Wetlands. ND Water Quality Monitoring Conference. Bismarck, ND.
Norland, J, C. Dixon, K. Askerooth. 2014. Review of current research on reducing exotic species in native seedings. ND Chapter of The Wildlife Society Annual Meeting, Mandan, ND.

Oduor, P.G., P. Gibbs, F.X. Casey and K. Forward. 2014. Analytical Solutions for Transformation of TCE through Argillaceous Membranes with or without a Biofilm. Vol. 46, No. 6. Geological Society of America, Vancouver. 19 October 2014.
Orndorff, Z.W., W.L. Daniels, M.S. Reiter, A.F. Wick. 2014. Prime farmland crop yields from four soil reconstruction treatments following mineral sands mining: A 9 year summary. Presentation. American Society of Mining and Reclamation meeting, June 14-20, Oklahoma City, OK. Abstract published by ASMR.
Osvaldo, T., A. Aponte, L.J. Cihacek, E.L. Deckard, B.L. Johnson, D. Samarappuli, K. Sedivec, and M.T. Berti. 2014. Performance and Production of Brassicas Cover Crops in North Dakota. ASA, CSSA, CCCS international Meeting, Long Beach, CA.
Owen, R.K., T.M. DeSutter, C.L. Reese, D.D. Malo, T.P. Kharel, G. Birru, D.E. Clay, and C.G. Carlson. 2014. Spatial variability of saline and sodic soils in the northern Great Plains. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Quast, J., S. DeKeyser, C. Dixon, A. Ganguli, and S. Travers. 2014. Potential management of Kentucky bluegrass ( <i>Poa pratensis</i> ) on native prairie in the Northern Great Plains. International meeting of the Society for Range Management. February. Orlando, FL.
Quast, J.L., E.S. DeKeyser, C. Dixon. 2014. Potential Management of Kentucky bluegrass ( <i>Poa pratensis</i> ) on U.S. Fish and Wildlife Service Native Prairie. February. 2014 Annual ND Chapter of The Wildlife Society Meeting, Mandan, ND.
Rakka, M.K., D.Franzen, and A. Chatterjee. 2014. Is air-drying of soil samples an appropriate step in determining plant available potassium for corn? ASA-SSSA-CSSA meetings, Nov. 2-5, Long Beach, CA.
Renton, D., D. Mushet, and S. DeKeyser. 2014. Climate change and upland management effects on Prairie Pothole wetlands. October. Annual North Central Region Chapter Meeting of the Society of Wetland Scientist. Carbondale, IL.
Russart, N., I.V. MacRae, M.A. Boetel, and R. Footitt. 2014. Summing behavior of sugarbeet root aphid ( <i>Pemphigus betae</i> Doane). Abstracts of the Entomological Society of America, annual meeting. Paper no. 1684.
Samson-Liebig, S.E., H. Weiser, W. Bott, T. Alme, J. Fuhrer, J. Printz, M.A. Liebig, A. Wick. 2014. Building Soil Health in North Dakota. Poster. World Congress of Conservation Agriculture International Meeting, June 22-25, Winnipeg, Manitoba.
Sanders, D., and Cihacek, L. J. 2014. Evaluating the influence of corn stover removal treatments on soil properties in North Dakota. Abst. No. 426-3. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014. Long Beach, CA.
Sedivec, K. 2014. Intensified Grazing Management in the Northern Plains – Improving the Harvest Efficiency of Our Rangelands. ASA, CSSA, CCCS international Meeting, Long Beach, CA.
Shelver, W., and T. DeSutter. 2014. Ractopamine uptake from soil by alfalfa ( <i>Medicago sativa</i> ) and wheat ( <i>Triticum aestivum</i> ). Presented at the ACS National Meeting. San Francisco, CA. August 10-14.
Sinha, S., A.-M. Fortuna and A.N. Bezbaruah. 2014. Nanoparticle-interactions on plant growth promoting bacteria, <i>Pseudomonas fluorescens</i> : A case study to show the effects of nanoscale zero-valent iron on <i>Pseudomonas fluorescens</i> . Annual Meeting North Central Branch of the American Society for Microbiology, Superior, WI. Undergraduate research presentation.
Stevens, L.J., R.B. Ferguson, M. Mamo, N.R. Kitchen, and D.W. Franzen. 2014. In-season nitrogen requirement for maize using model and sensor-based recommendation approaches. 12 <sup>th</sup> International Conference on Precision Agriculture, July 20-23, 2014, Sacramento, CA.
Teuber, O., A. Aponte, L. J. Cihacek, E. L. Deckard, B. L. Johnson, D. Samarappuli, K. Sedivec, and M. Berti. 2014. Performance and production of brassica cover crops in North Dakota. Abst. No. 400-2. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014. Long Beach, CA.

Tomlinson, H., A. Klaustermeier, R. Limb, A.L. Daigh, and K. Sedivec. 2015. The impacts of brine spill and vegetation parameters in the Bakken region of Western North Dakota. <i>In Annual Meeting Abstracts</i> . Society for Range Management, Wheat Ridge, CO.
Voirin, C., T.M. DeSutter, C. Vahl, and F.X.M. Casey. 2014. Mercury accumulation in <i>Eisenia hortensis</i> from FGDG and mercury chloride amended soils. Presented at the International Meetings of the ASA-CSSA-SSSA. Long Beach, CA. November 2-5.
Wamono, A.W., D.D. Steele, Z. Lin, T. DeSutter and X. Jia. 2014. Penetration Resistance Measurements to Evaluate the Effects of Calcium Amendments and Water Management Strategies in Sodic-Saline Soils. Presented at the 2014 ASABE Intersectional Meeting, 28-29 March, Brookings, South Dakota, USA.
Wamono, A.W., D.D. Steele, Z. Lin, Zhulu, T. DeSutter, and X. Jia. 2014. Effects of calcium based surface amendments and cover crops on the penetration resistance of subsurface drained sodic-saline soils. Presented at the 2014 Annual International Meeting of the American Society of Agricultural Engineers, 13-16 July, Montreal, Quebec Canada.
Wenninger, E., S. Emmert, K. Tindall, H. Ding, M.A. Boetel, and S.D. Eigenbrode. 2014. Aggregation behavior and a putative sex pheromone in the sugar beet root maggot fly, <i>Tetanops myopaeformis</i> . Abstracts of the Entomological Society of America, annual meeting. Paper no. 1402.
Werkmeister, C., L. J. Cihacek, D. Jacob, and M. Otte. 2014. Biogeochemistry of wetland soil at depth within the Prairie Pothole Region. Abst. No. 180-6. ASA, CSSA, and SSSA 2014 International Annual Meetings, Nov. 2-5, 2014. Long Beach, CA.
Wick, A.F., D. Toussaint, G. LaPlante. 2014. Integrated Approaches to Selecting Management Strategies for Soil Health. Soil Science Society of America National Meeting, November 3-5, Long Beach, CA.
Wolters, B., D.P. Collins, A-M Fortuna, C.G. Cogger, and A.I. Bary. Greenhouse Gas Emissions in No-till Vegetable Production. ASA, Long Beach, CA. (Role: Aided in the original design of the experiment my lab processed all soil samples and took all measurements other than CO <sub>2</sub> evolved. This research is from my PI grant proposal)
Zitnick-Anderson, K.K., Norland, J. E., del Rio, L., Fortuna, A. M., and Nelson, B. 2014. Soil properties associated with the presence of Pythium communities in soybean roots. Phytopathology 104:S3.138. Role: I played a large role in the interpretation and analysis of the data

### 3. Proceedings papers (11)

<b>Proceedings Papers - 11</b>
Carvajal, M. A., D. A. Rider, and E. I. Faundez. 2015. Revision of the genus <i>Tolono</i> Rolston & Kumar, 1975 (Hemiptera: Heteroptera: Acanthosomatidae), with descriptions of two new species. Proceedings of the Entomological Society of Washington [in press or accepted]
Franzen, D., N. Cattanach, A. Chatterjee, L. Sharma, and H. Bu. 2013. Split application of N on sugarbeet grown on Fargo soils. In 2014 Sugarbeet Research and Extension Reports. <a href="http://www.sblog.org/research/soil/soil13/FranzenFargoSoils.pdf">http://www.sblog.org/research/soil/soil13/FranzenFargoSoils.pdf</a>
Franzen, D.W., L. Sharma, and H. Bu. 2014. Active optical sensor algorithms for corn yield prediction and in-season N application in North Dakota. In Proceedings of the 12th International Conference on Precision Agriculture, Sacramento, CA. July 20-23.
Franzen, D.W., L. Sharma, and H. Bu. 2014. North Dakota corn recommendations for preplant and sensor directed sidedress N. p. 155-165. In Proceedings of the North Central Extension-Industry Soil Fertility Conference, Vol. 30. November 19-20, Denver, CO.
Franzen, D.W., L. Sharma, and H. Bu. 2014. Preview of new nitrogen recommendations for corn in North Dakota. p. 23-32. In Proceedings of the Great Plains Soil Fertility Conference, Vol. 15, March 4-5, Denver, CO.

Hargiss, C, J. Norland, T.M. DeSutter, and F.X.M. Casey. August 2014. Estimating the Impact to Wetlands in Western North Dakota from Dust and Road Use Increases Due to Energy Development. Final Report. Cooperative project between North Dakota and US EPA, Region VIII. Section 319.
Maharlooei M, S Sivarajan, SG Bajwa, JP Harmon, J Nowatzki. Digital imaging technique to detect and count aphids in soybeans. 18 <sup>th</sup> World Congress of CIGR, International Commission of Agricultural and Biosystems Engineering. Beijing, China, September 2014.
Rider, D. A. and P. Kment. 2015. On the correct name of <i>Coptosoma pygmaeum</i> Jensen-Haarup, 1926 (Hemiptera: Heteroptera: Plataspidae). Proceedings of the Entomological Society of Washington [in press or accepted]
Steele, D.D., T.F. Scherer, F.A. Akyuz, A. Wamono, T.M. DeSutter, and S.R. Tuscherer. 2014. Evaluation of a low-cost optical rain sensor. Paper No. SD14-063. St. Joseph, Michigan: ASABE.
Stevens, L.J., R.B. Ferguson, M. Mamo, N.R. Kitchen, and D.W. Franzen. 2014. In-season nitrogen requirement for maize using model and sensor-based recommendation approaches. In Proceedings of the 12 <sup>th</sup> International Conference on Precision Agriculture, July 20-23, 2014, Sacramento, CA.
Zelevnik, J.D., A.J. David, and J. Hendrickson. 2014. A Model System for the Genetic Conservation of Ash ( <i>Fraxinus spp.</i> ). Upper Midwest Invasive Species Conference. October 20-22, 2014, Duluth, MN.

#### 4. National or International Invited Presentations (20)

<b>National or International Invited Presentations - 20</b>
Boetel, M.A. 2014. Sugarbeet insect management in North America. Invited seminar for government officials, visiting scientists, and agricultural industry leaders from Kyrgyzstan, April 2014, Fargo, ND.
Carvajal, M. A., D. A. Rider, and E. I. Faundez. 2014. Preliminary studies on the spermatheca of the Acanthosomatidae (Hemiptera: Heteroptera). International Heteropterists Society, 5 <sup>th</sup> quadrennial meeting, Washington, D.C., July.
Carvajal, M. A., E. I. Faundez, and D. A. Rider. 2014. Revision of <i>Acrophyma</i> (Heteroptera: Acanthosomatidae) with description of a new species from Brazil. International Heteropterists Society, 5 <sup>th</sup> quadrennial meeting, Washington, D.C., July. [poster presentation]
Casey, F.X.M. 2014. Estrogenic Hormones in the Environment. ND Water Quality Monitoring Conference. March 4-16. Bismarck, ND. Plenary talk.
Daigh, A. 2014. Surviving and Thriving Your First Year. Panelist and breakout group leader of for current or interring first year graduate students at the 2014 ASA, CSSA, and SSSA International Annual Meeting, Long Beach, CA, Nov. 3 <sup>rd</sup> , 2014.
DeSutter, T. 2014. Saline and Sodic Soils. Presented to faculty at the Coastal Agricultural Research Institute, Hebei Academy of Agricultural Sciences. Tanghai, Hebei. August.
DeSutter, T., and D. Franzen. 2014. Soil Conservation and Fertility of Soybeans. Presented two times to local farmers and government officials in Heilongjiang Province. August.
Faundez, E. I. and D. A. Rider. 2014. Preliminary notes on the tribe Aeptini (Heteroptera: Pentatomidae: Pentatominae). International Heteropterists Society, 5 <sup>th</sup> quadrennial meeting, Washington, D.C., July.
Faundez, E. I. and D. A. Rider. 2014. Revision of <i>Acletra</i> ( <i>Neoaclatra</i> ) (Heteroptera: Pentatomidae). International Heteropterists Society, 5 <sup>th</sup> quadrennial meeting, Washington, D.C., July.
Foster, S.P. 2014. Using stable isotopes for studying nutrient allocation to sex pheromone production and reproduction in the moth <i>Heliothis virescens</i> . Northwest Agricultural & Forestry University, Yangling, China, October 2014.
Goos, R.J. 2014. Some effects of climate change and technological change on agriculture in North Dakota, USA. Ege University, Izmir, Turkey. 26 September 2014.
Harris, M.O. 2014. Pollinators and Larcenists of a Rare Orchid of the Tallgrass Prairie. Native Orchid Society, Itasca, Minnesota, 14 July 2014.

Harris, M.O., Steven Xu, T. Friesen, D. Giron, and J.J. Stuart. 2014. Gene-for-gene Interactions between Wheat and a Gall-forming Insect. Special Symposium, Mechanisms of Plant-Insect Interactions, Society for Experimental Biology, Manchester, England, 4 July 2014.
Harris, M.O., Steven Xu, T. Friesen, D. Giron, and J.J. Stuart. 2014. Pivoting from <i>Arabidopsis</i> to wheat to understand how agricultural plants integrate responses to biotic stress. Special Symposium, Mechanisms of Plant-Insect Interactions, Northwest Agriculture and Forestry University, Yangling, China, 27 <sup>th</sup> October 2014.
Hovick, T. 2014. Use of the fire-grazing interaction in avian conservation. American Ornithologists' Union/Cooper Ornithological Society/Society of Canadian Ornithologist's Joint Meeting. Estes Park, CO. September, 2014.
Ives AR, VC Radeloff, KM Oliver, JP Harmon. The role of taxonomic, functional, genetic, and landscape diversity in food web responses to a changing environment. 2014 NASA Biodiversity and Ecological Forecasting Team Meeting. Silver Springs, MD, May 2014 (Invited Presentation)
McGranahan, DA and KP Kirkman. 2014. Research on rangeland bird responses to disturbance in sub-Saharan Africa lacks attention to spatial, temporal scale. American Ornithologists' Union, Estes Park, CO. September 14, 2014.
Sedivec, K. 2014. Intensified Grazing Management in the Northern Plains – Improving the Harvest Efficiency of Our Rangelands. ASA, CSSA, CCCS international Meeting, Long Beach, CA.
Sedivec, K. 2014. Invasive Grasses of North America. North American Invasive Species Management Association, Fargo, ND
Wick, A.F., W. Daniels, P. Stahl. 2014. Invited. Soil Carbon in Reclaimed Mine Soils. Soil Science Society of America National Meeting, November 3-5, Long Beach, CA.

5. Books (0)

6. Book Chapters (5)

<b>Book Chapters - 5</b>
Foster, S.P. 2015. Toward a Quantitative Paradigm for Sex Pheromone Production in Moths. In <i>Pheromone Communication in Moths: Evolution, Behavior and Application</i> (J.D. Allison & R.T. Cardé, eds). University of California Press, Berkeley, in press.
Franzen, D. and D. Mulla. History of Precision Agriculture. Submitted, accepted for publication.
Franzen, D. Crop Specific Nutrient Management. Submitted, accepted for publication
Newcomb, R.D., Steinwender, B., Albre, J. and S.P. Foster. 2015. The endemic New Zealand genera <i>Ctenopseustis</i> and <i>Planotortrix</i> : A down-under story of leafroller moth sex pheromone evolution and speciation. In <i>Pheromone Communication in Moths: Evolution, Behavior and Application</i> (J.D. Allison & R.T. Cardé, eds). University of California Press, Berkeley, in press.
Wick, A.F., B.A. Geaumont, K. Sedivec, J. Hendrickson. In press. Grassland Degradation. In: R. Sivanpillai, J. Schroder (Eds), Biological and Environmental Hazards, Risks and Disasters, Volume 8. Elsevier.

7. Research Reports (40)

<b>Research Reports - 40</b>
Awale, R., A. Chatterjee, H. Kandel, C. Deplazes, N. Cattanaach. 2014. Sub-surface drainage and nitrogen fertilizer management influences on sugarbeet yield and soil nitrogen dynamics under silty-clay soil. 2013 Sugarbeet Research and Extension Reports, P. 95-99, available: sbreb.org. (Major advisor of the first author)
Blawat, M., A.F. Wick. 2014. Cover Crops used as a Viable Tool for Soil Health, Impact Report, NDSU Extension Service.

Blawat, M., A.F. Wick. 2014. Local Relationships for Building Soil Health, Impact Report, NDSU Extension Service.
Boetel, M.A., A.J. Schroeder, and R.J. Dregseth. 2014. Registered and experimental insecticides applied at planting time and postemergence for sugarbeet root maggot control. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 146-151.
Boetel, M.A., A.J. Schroeder, R.J. Dregseth, T.A. Lunde, and S.C. Lahman. 2014. Sugarbeet root maggot fly monitoring in the Red River Valley – 2013. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 143-144.
Boetel, M.A., R.J. Dregseth, and A.J. Schroeder. 2014. Sugarbeet root maggot population forecast for 2014. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 145.
Boetel, M.A., R.J. Dregseth, and A.J. Schroeder. 2014. Yield and quality of sugarbeet treated with tank mixtures of foliar fungicides, insecticides, and glyphosate herbicide: a two-year study. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 152-154.
Carlson, A.L., M.A. Boetel, and M.F.R. Khan. 2014. Survey of insecticide use in sugarbeet in Minnesota and eastern North Dakota in 2013. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 139-142.
Carlson, A.L., M.F.R. Khan, and M.A. Boetel. 2014. Survey of fungicide use in sugarbeet in Minnesota and eastern North Dakota in 2013. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 160-164.
Carlson, A.L., M.F.R. Khan, and M.A. Boetel. 2014. Survey of weed control and production practices on sugarbeet in Minnesota and eastern North Dakota in 2013. Sugarbeet Research and Extension Reports. North Dakota State University Coop. Ext. Serv. 44: 44-57.
Chatterjee, A. 2014. Comparing available iron fertilizers to manage soybean iron deficiency Chlorosis. North Dakota Soybean Council Research Update P. 28. Available online: <a href="http://ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf">ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf</a> (NDSU)
Chatterjee, A. 2014. Soybean response to conservation tillage practices under tile drained conditions. North Dakota Soybean Council Research Update P. 25. Available online: <a href="http://ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf">ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf</a>
Chatterjee, A., H. Kandel, R. Awale. 2014. Soybean response to nitrogen management under tile drained conditions. North Dakota Soybean Council Research Update P. 27. Available online: <a href="http://ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf">ndsoybean.org/wp-content/uploads/2012/06/2014-NDSC-Research-Report-Web.pdf</a>
Cihacek, L., and G. Aher. 2014. Winter wheat management for improving soil quality and reducing greenhouse gas emissions. Final report to Ducks Unlimited, Inc. Bismarck, ND. January 2014. 22 p.
Casey, F.X.M. 2014. The article “Fate of 17 $\beta$ -Estradiol in Anaerobic Lagoon Digesters” featured our research. CSA News. March 2014. p. 13
Daigh, A., J. DeJong-Hughes, A.Wick. 2014. Maximizing Soil Warming and Health under Different Tillage Practices in a Corn-Soybean Rotation, ND Soybean Council Mid-Term Report (6 mo).
DeKeyser, E.S. 2014. Annual Report: Grazing regime effects on sensitive birds. U.S. Forest Service.
DeKeyser, E.S. 2014. Annual Report: Increasing biological functions and integrity of wetlands while ensuring the utilization of long-term easements.
DeKeyser, E.S., C. Hargiss, J. Norland, and T. DeSutter. 2014. Final Report: Intensification of the National Wetland Condition Assessment in the Prairie Pothole Region of North Dakota. EPA Region VIII/ND Department of Health.
DeKeyser, E.S., K. Sedivec, J. Norland, and J. Zeleznik. 2014. Final Report: Maintenance of Natural Sustainable Riparian Communities Located within the Middle Sheyenne Watershed.
DeKeyser, E.S., S. Travers, and A. Ganguli. 2014. Annual Report: The role of <i>Poa pratensis</i> genetics in current private, state, non-profit, and federal management efforts. U.S. Fish and Wildlife Service.
DeSutter, T., A. Chatterjee, A. Wick. 2014. Improving Soil Health and Productivity of Sodic Soils, ND Soybean Council Mid-Term Report (6 mo).

Franzen, D.W., H. Bu, L. Sharma, N. Cattanach, A. Chatterjee, A. Denton. 2014. Sugarbeet yield prediction using active-optical sensors. 2013 Sugarbeet Research and Extension Reports, P. 131-136, available: sbreb.org. (Supported field experiment)
Franzen, D.W., N.Cattanach, A. Chatterjee, L. Sharma, H. Bu. 2014. Split applications of N on sugarbeet grown on Fargo Soils. 2013 Sugarbeet Research and Extension Reports, P. 123-126, available: sbreb.org. (Supported field experiment)
Gaugler, E.M., B.W. Neville, A.F. Wick, D.L. Whitted, and K.K. Sedivec. 2014. Utilizing annual forages in single- and dual-crop systems for late-fall and early winter grazing: Impacts on cattle performance and economics. 2014 Beef Report. North Dakota State University, Fargo, ND. Pp 31-33.
Hargiss, C., J. Norland, E.S. DeKeyser, T. Desutter, and F. Casey. 2014. Final Report: Estimating the Impact to Wetlands in Western North Dakota from Dust and Road Use Increases due to Energy Development. North Dakota Department of Health/EPA Non-Point Source Pollution.
Hargiss, C.L.M., J.E. Norland, T.E. DeSutter, E.S. DeKeyser, and F. Casey. 2014. Final Report: Estimating the Impact to Wetlands in Western North Dakota from Dust and Road Use Increases due to Energy Development. ND Dept. of Health/EPA Region VIII.
Hovick, T.J. and R.D. Elmore. 2014. Effects of Oil and Gas Infrastructure on Greater Prairie-Chicken Habitat Use. Provided to The Nature Conservancy.
Knudson, M., A.F. Wick. 2014. Salinity Management and Cover Crops, Impact Report, NDSU Extension Service.
Lipinski, A., R. Limb, K. Sedivec, and B. Geaumont. 2014. Grassland bird, rangeland vegetation and prairie dogs on grazed mixed-grass prairie. 2014 Beef Report. North Dakota State University, Fargo, ND. Pp 49-51.
Lipinski, A., R. Limb, K. Sedivec, and B. Geaumont. Grassland bird, rangeland vegetation and prairie dogs on grazed mixed-grass prairie. Pp. 49-51. In: North Dakota Beef Report AS1736. (Role: I assisted with data analysis, data interpretation and manuscript editing)
Otte, M.L., E.S. DeKeyser, D.L. Jacob, C. Hargiss, A. Yellick, A. Asgary. 2014. Final Report: Spatial Variation in Multi-Element Fingerprints for Rapid Chemical, Assessment of Soils in North Dakota Wetlands. EPA Region VIII/ND Department of Health.
Prischmann-Voldseth DA, Chatterjee A, Hansen A, Gramig G. 2014. Impact of weed management on soil arthropods in a soybean cropping system. North Dakota Soybean Council. Research Update 2013, pg 8.
Scheve, A., A.F. Wick. 2014. Bringing Cover Crops and Soil Health to Traill County, Impact Report, NDSU Extension Service.
Scheve, A., A.F. Wick. 2014. Bringing Salinity Management Options to Producers, Impact Report, NDSU Extension Service.
Wick, A.F. 2014. Cover Crop Programs in the Red River Valley, Impact Report, NDSU Extension Service.
Wick, A.F. 2014. Eastern North Dakota Soil Salinity Specialist – Years Three, Four and Five, ND Department of Health, EPA 319, Annual Report.
Wick, A.F., B. Geaumont, K. Sedivec. 2014. Reclamation in the Bakken, Impact Report, NDSU Extension Service.
Wick, A.F., F.X.M. Casey, D. Ripplinger. 2014. Research and Extension Efforts at the SHARE Farm, ND Soybean Council Mid-Term Report (6 mo).
Wick, A.F., J. Harmon, D. Prischmann-Voldseth. 2014. From the Ground Up: How do Soil Salinity Gradients Damage Soybeans, Contribute to Arthropod Pest Infestations and Impact Soil Nitrogen Reserves?, ND Soybean Council Mid-Term Report (6 mo).

## 8. Popular Press articles (13)

### Popular Press Articles - 13

Daigh, A.L. 2014. Surviving the interview and your first year in academic research. Crop, Soil and Agronomy News, December Issue. ASA-CSSA-SSSA, Madison, WI.
Daigh, A.L. 2014. With Opportunity Comes Many Blessings. Crop, Soil and Agronomy News, March Issue. ASA-CSSA-SSSA, Madison, WI.
Franzen, D. 2014. For the first time, precise fertility guidelines for corn can save you 40-50 pounds nitrogen with continuously no-tilled ground. F. Lessiter, No-Till Farmer November, 2014, page 6.
Franzen, D. 2014. No-till saves nitrogen costs. S. Winsor. Corn and Soybean Digest. November, 2014, p. 14-16
Goos, R.J. 2014. The Weird World of Natto. North Dakota Soybean Grower Magazine, April 2014.
Heglund, C.M, A.F. Wick, L. Briesse. 2014. Salinity Management: What's your Number? SWCS Magazine, April.
Hopkins, D. 2014. Advised Prof. Deborah Blum, Univ of Wisconsin and New York Times writer (The Poison Pen) on background levels of cadmium in North Dakota soils and discussed my research on naturally elevated soil Cd levels along the Pembina Escarpment, 4/14/14 (her article was shortened by her editor, and the Cd story was not included).
Norland, J. 2014. Patching Prairies: A new less costly approach to tallgrass restoration shows promise. Landscape Architecture Magazine, Oct 2014, p. 42.
Wick, A., H. Weiser, and T. DeSutter. 2014. Divide and conquer: Managing saline soils. Progressive Forage Grower. 15 (9): 11-12.
Wick, A.F. 2014. Summary of the Annual Soil Health Field Day
Wick, A.F., F. Casey, G. LaPlante. 2014. Helping North Dakota Farmers Improve Soil Health. The LICA Contractor National Magazine.
Wick, A.F., H. Weiser, T. DeSutter. 2014. Managing Saline Soils. Progressive Forage Grower Magazine.
Wick, A.F., J. Harmon, D. Prischmann-Voldseth. 2014. From the Ground Up: How Soil Salinity Gradients Damage Soybeans, Contribute to Arthropod Pest Infestations and Impact Soil Nitrogen Reserves, ND Soybean Council Final Report, published.

## 9. Reviewed Extension publications (11)

<b>Reviewed Extension Publications - 11</b>
Boetel, M.A. 2014. Insect Management. In M. Khan (ed.), Sugarbeet Production Guide. North Dakota State University and University of Minnesota Coop. Ext. Serv. pp. 54-74. Bulletin #A1698. 99 pp.
Daigh, A., R. Limb, A. Wick, K. Sedivec. 2014. Brine Spill, Fact Sheet.
Daigh, A., R. Limb, A. Wick, K. Sedivec. 2014. Hydrocarbon, Fact Sheet.
DeJong-Hughes, J., D. Franzen, and A. Wick. 2014. Reduce wind erosion for long term productivity. Univ. of MN Ext. Circ.
Franzen, D.W. 2014. Soil Fertility Recommendations for Corn. NDSU Ext. Circ. SF-722 (Revised).
Franzen, D.W., L. Sharma, and H. Bu. 2014. Use of active-optical sensors for yield estimation and to direct in-season N application in corn. NDSU Ext. Circ. 1176-5.
Knodel, J., P. Beauzay, and M. Boetel. 2014. North Dakota Field Crop Insect Management Guide. North Dakota State University Coop. Ext. Serv. Bulletin #E-1143. 107 pp.
Scasta, J.D. 2014. Forage Selection Differences Between Ungulates. University of Wyoming
Sedivec, K. and J. Printz. 2014. Ranchers Guide to Grassland Management IV. Circ. R1707, North Dakota State University Extension Service, Fargo, ND. 98 pp.
Sedivec, K., C. Piper, J. Printz, A. Wick, A. Daigh, R. Limb. 2014. Successful Reclamation of Lands Disturbed by Oil and Gas Development and Infrastructure Construction. NDSU Extension Publication, R1728.

Sedivec, K., C. Piper, J. Printz, A. Wicke, A. Daigh, and R. Limb. 2014. Successful reclamation of lands disturbed by oil and gas development and infrastructure construction. Circ. R1728, North Dakota State University Extension Service, Fargo, ND. 15 pp.
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## 10. Videos (10)

Videos – 10
Wick, A.F. 2014. Belowground at the SHARE Farm – Part 1, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=4YUFiXgTr8Q">https://www.youtube.com/watch?v=4YUFiXgTr8Q</a>
Wick, A.F. 2014. Belowground at the SHARE Farm – Part 2, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=lGiwfFC2LoM">https://www.youtube.com/watch?v=lGiwfFC2LoM</a>
Wick, A.F. 2014. Belowground at the SHARE Farm – Part 3, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=1KrLd9uyNEI">https://www.youtube.com/watch?v=1KrLd9uyNEI</a>
Wick, A.F. 2014. Tillage Project Introduction Video, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=-8gAfTYktg">https://www.youtube.com/watch?v=-8gAfTYktg</a>
Wick, A.F. 2014. Cover Crops 101, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=nTXEj5CNBik">https://www.youtube.com/watch?v=nTXEj5CNBik</a>
Wick, A.F. 2014. Improving Soil Health on Sodium Affected Soils, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=yyEfpsmFLfk">https://www.youtube.com/watch?v=yyEfpsmFLfk</a>
Wick, A.F. 2014. Managing for Soil Health Workshop, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=2Slo0dhoRjY">https://www.youtube.com/watch?v=2Slo0dhoRjY</a>
Wick, A.F. 2014. Salinity Management: What's Your Number, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=FPILb3m7ARU">https://www.youtube.com/watch?v=FPILb3m7ARU</a>
Wick, A.F. 2014. The Chemistry of Soluble Salts, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=MurTticITDU">https://www.youtube.com/watch?v=MurTticITDU</a>
Wick, A.F. 2014. Crop Response to Salinity, Extension Education Video, InHouse Productions, <a href="https://www.youtube.com/watch?v=soYmcPQlY7o">https://www.youtube.com/watch?v=soYmcPQlY7o</a>

## 11. Webinars (5)

Webinars - 5
Fortuna, A. 2014. Why the Concern about Nitrous Oxide Emissions? February 25, 2014 75 minutes over 100 people.
Fortuna, A. 2014. Management to Reduce N <sub>2</sub> O Emissions in Organic Vegetable Production Systems February 27, 2014 75 minutes over 80 people.
Franzen, D. 2014. Soil sampling for site-specific nutrient management, ASA, June, 2014
Franzen, D. 2014. Soil erosion effects on soil health, NC soil health network, September 17, 2014
Franzen, D. 2014. Sensor use in crop production, ASA, December 3, 2014

## 12. Software (0)

## 13. Apps (0)

## III. Awards (State, Regional, National, International)

Awards
Goos, R.J. 2014. Named a “Fellow” of the American Society of Agronomy.
Limb, R. 2014. Received Society for Range Management Outstanding Young Professional award (Jan 2015)
Wick, A. 2014. Received the Persistence and Vision award for efforts at SHARE farm by ND Corn

Utilization Council and Growers Association.
Wick, A. 2014. Received the National Harold-Kay School Excellence in Conservation award through the ND Soil and Water Conservation Society.
Hargiss, C. 2014. Received the 10 years of service award for River Keepers for volunteering for 10 years for the Red River Water Festival teaching area 4th graders about water.
Wick, A. 2014. Received Service Award for the NDSU Soil Health Program through the ND Chapter of the Soil and Water Conservation Society.