Annual Report
July 1, 2012 - June 30, 2013

College of Agriculture, Food Systems and Natural Resources

With contributions from

North Dakota Agricultural Experiment Station
NDSU Extension Service

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Chris Boerboom – Director, NDSU Extension Service
David S. Buchanan – Associate Dean for Academic Programs
Jane M. Schuh – Assistant Dean for Academic Programs
A. Goals and Priorities for the Past Year

To provide high quality education programs for both undergraduate and graduate students in various disciplines pertaining to agriculture, food systems and natural resources

Perform research in areas that contribute to knowledge pertaining to agriculture, food systems and natural resources for the benefit of North Dakota, the nation and the world

Provide high quality extension/outreach programs in topics pertaining to agriculture, food systems and natural resources

Perform service that supports North Dakota State University and the various professions to which members of the College belong

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities

a. Teaching

- Continued upward trend in student enrollment with the undergraduate population exceeding 1400 for the first time and graduate enrollment in excess of 200 students
- The new Commodity Trading Room helps increase the teaching of risks and risk management strategies to traditional students and non-traditional students.
- ABEN underwent the ABET evaluation process and a site visit successfully for accreditation
- Initiated a foreign travel course in which 19 students traveled to China for two weeks to learn about Chinese agricultural production systems.
- Collaboration with Zhejiang Economic Trade and Polytechnic Institute (ZJETP) to enroll Food Safety students at NDSU after completion of their studies at ZJETP
- Leveled-learning outcomes were designed in the School of Natural Resource Sciences
- A student presentation series on the most recent work in molecular plant pathology was initiated.
- The increases in the CWS program are driven by strong employment opportunities.
- VMS hosted pilot of disciplinary writing consultant program for CAFSNR

b. Research/Scholarly/Creative Activities

- Phase 3 of the Agricultural Experiment Station Greenhouse Complex is progressing.
- The NDSU Beef Cattle Research Complex was in its first full year of operation in 2012.
- Faculty continue to participate in collaborative research and graduate advising with several countries such as Kazakhstan, Bangladesh, China, Turkey, and other countries and NDSU hosted visiting scientists from India, Mongolia, Uzbekistan and elsewhere
- A new Pulse Quality and Nutrition Laboratory was established.
- The $2.2M ND Legislative initiative, “Soil Health and Land Management,” has had a major impact on the School. As a result two assistant professors and one research specialist were hired.
- Dr. Mike McMullen released Jury oat, which will provide growers with a high yielding and quality disease resistant cultivar.

c. Service/Outreach/Extension

1. Outreach/Extension

The NDSU Extension Service has integrated faculty and specialists in five departments and the SNRS. These individuals are continually assessing stakeholder needs and developing highly responsive programs, which lead to transformational education. Drs. Wick and Stokka are new hires and are launching new programs in soil health and livestock stewardship, respectively. Drs. Ripplinger and McGinnis were hired to continue highly valued programs in bioenergy economics and horticulture, respectively. Through a combination of literally hundreds of seminars, workshops and field day presentations, distance education, and numerous media resources, these Extension specialists provided 388,000 educational clientele contacts either directly or indirectly through a network of local Extension agents in 52 counties. Examples of program impacts from the past year include: 1) revision of the ND Agricultural Land Valuation Model which was applied state-wide for tax assessments; 2) 450 individuals learned about tile drainage, which will guide their future decisions on adopting the technology, 3) readers of the Ranch Hand newsletter reported that 62% increased net income and 71% improved productivity or production by implementing ideas from the newsletter; 4) creation of the Dragon Fly Garden at the United Tribes Technical College to promote wellness and entrepreneurship through horticulture; 5) provided an estimated $217,000 value in
diagnoses and recommendations through the Plant Diagnostic Lab; 6) improved nitrogen fertility recommendations in wheat, which likely improved wheat protein levels about 0.5 percent in 2012 and would be valued at over $100 million.

2. Service

- Dr. Miljkovic: Editor of *Journal of International Agricultural Trade and Development*
- Dr. Koo - Co-editor for *Chinese Agricultural Economic Review* and Economic Advisor to the U.S. Secretary of Agriculture and Trade Ambassador
- Dr. Kim Vonnahme - Director-at-large for the American Society of Animal Sciences.
- Dr. Greg Lardy - President-Elect of the American Society of Animal Sciences.
- Dr. Myers - President of the American Oil Chemists Society
- Dr. Hall - Vice President of the Flax Institute of America, and on
- Dr. Hall - Editorial Boards for the American Oil Chemists’ Society and the Bean Institute
- Natural Resource Sciences School faculty served on 7 editorial boards, reviewed 64 publications, served on 4 grant panels, served as Panel Manager for NIFA-AFRI.
- Dr. Gudmestad served on a grant review panel for USDA-NIFA-SCRI.
- Dr. Brueggeman was Vice Chair of the National Barley Improvement Committee, Chair of the US wheat and barley scab initiative, Co-Chair of organizing committee of the International Triticeae Mapping Initiative workshop and a member of the National Science Foundation SDS Plant review panel.
- Dr. Zhong was member of Editorial Board of *The Open Mycology Journal* and members of three APS committees (Genetics, Mycology, Host Resistance).
- Dr. LeBoldus was Secretary of NCERA-224 and is organizing the 2013 meeting.
- Dr. Secor is Chair of the Editorial Board, Focus on Potato.
- Dr. Markell was a member of the NIFA grant review panel on Integrated Pest Management.
- Dr. Khan serves as Vice Chair of the Extension General Policy Committee of APS.
- Dr. Marisol Berti is the Editor-Chief of the *Industrial Crops Journal*.
- Dr. Rod Lym organized the annual meeting of the Weed Science Society of America and became the Society President.
- Prüß, B.M. – President of North Central Branch-American Society for Microbiology
- Khaita, M.L. – One Health Committee of Association of American Veterinary Medical Colleges as the chair-elect.
- Khaita, M.L. founder East African sister organization for Higher Education Resource Services (HERS);
- Wolf-Hall, C., Past-President for Gamma Sigma Delta – The Honor Society for Agriculture
- Becky Koch began her term as President of the Association for Communication Excellence

C. Department/Unit/College Goals and Priorities for the Coming Year

To provide high quality education programs for both undergraduate and graduate students in various disciplines pertaining to agriculture, food systems and natural resources
Perform research in areas that contribute to knowledge pertaining to agriculture, food systems and natural resources for the benefit of North Dakota, the nation and the world
Provide high quality extension/outreach programs in topics pertaining to agriculture, food systems and natural resources
Perform service that supports North Dakota State University and the various professions to which members of the College belong

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<th>Research, Scholarly, and Creative Activities</th>
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Department of Agricultural and Biosystems Engineering

A. Department/Unit/College Goals and Priorities for the Past Year
   • Provide high quality undergraduate educational programs in Agricultural and Biosystems Engineering and Agricultural Systems Management
   • Provide high quality MS and PhD educational programs in Agricultural and Biosystems Engineering and secure external funding for graduate students
   • Attract and retain diverse undergraduate and graduate students
   • Conduct scholarly activities that extends the knowledge base to; enhance agricultural production efficiency, profitability, and sustainability, maintain add and/or add value to biological materials, and develop efficient use and stewardship of environmental resources
   • Provide extension and outreach education with a focus on current issues
   • Provide opportunities for professional development of faculty and staff to keep knowledge and skills current in their areas of professional practice
   • Developed nationally and internationally recognized research programs in precision agriculture and machinery systems engineering
   • Focus on undergraduate student recruitment to retain female and diverse students

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities for this Past Year which include the following areas:
   a. Teaching
      • ABEN underwent the ABET evaluation process and a site visit successfully for accreditation
      • ABEN graduated 34 undergraduate students in 2012-13 academic year
      • ABEN student numbers continue to increase; 37 ABEN courses were taught in 2012-13
      • Dr. Xinhua Jia received tenure and promotion to Associate Professor
      • Remodeled 210B into an instrumentation and teaching laboratory with an increased capacity of 24 students
      • Continue to bring in guest speakers and tour nearby industries to provide exposure to real-life engineering situations
      • Conducted mid-term course surveys and peer evaluations for course improvement
      • Established a new course and curriculum assessment protocol to meet the needs of ABET and university assessment process while improving the curriculum
      • Updated courses to keep current with newest software releases and technologies
      • Faculty attended several professional development opportunities such as pedagogical seminars and teaching workshops on and off campus
      • ABEN undergraduate students participated in the international quarter scale tractor competition held by ASABE, placing first in maneuverability and 16th in overall score
      • Faculty visited Kazakhstan, Uzbekistan and Turkey to develop teaching collaborations
      • The number of women students in ABEN undergraduate program increased to 20%, in addition to the many other underrepresented students.
   b. Research/Scholarly/Creative Activities
      • ABEN faculty’s research output (grants obtained, grant proposals submitted, publications, graduate students, etc) increased significantly from previous year
      • ABEN faculty address research needs in the state and nation in the areas of biofuel processing, agricultural storage and product quality, irrigation and drainage, soil and water quality, precision agriculture, machinery systems, livestock environment, feedstock pre-processing, biomaterials, waste management and various other
Engineering aspects of production agriculture

- Active research funding included $7.72 million cumulative from 40 different grants, of which ABEN’s portion was $2.37 million
- ABEN faculty published 33 peer-reviewed articles, 4 books and 25 conference presentations
- ABEN hired a new faculty in the bioenvironmental engineering area
- Dr. Ganesh Bora received superior paper award from ASABE in 2012
- ABEN faculty trained five MS and eight PhD students, and graduated 2 students
- Faculty participated in thirty-two graduate committees outside of ABEN
- Faculty continue to participate in collaborative research and graduate advising with several countries such as Kazakhstan, Bangladesh, China, Turkey, etc
- Hosted visiting scientists from India, Mongolia, and Uzbekistan
- Hired a research specialist and one post-doctoral research associate to enhance research programs

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<th>Peer Reviewed Publications (published or accepted)</th>
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C. Service/Extension/Outreach

- Dr. Ken Hellevang received two awards; Distinguished Team Award and North Central Region Distinguished Team Award, Epsilon Sigma Phi
- ABEN extension faculty provided leadership in the state on energy education, grain drying, irrigation, drainage, machinery systems, livestock environment, precision agriculture and feedstock pre-processing
- ABEN faculty published several extension publications, made news releases, webinars, videos, popular press articles, workshops, field day presentations, etc.
- Extension faculty made helped the public by one on one contact through phone and email communications.
- ABEN faculty are active members of several professional organizations, and served these organizations in many leadership roles
- ABEN faculty served on proposal review panels and journal/conference editorial boards
- ABEN faculty participated in many service activities including department, college, and university committees.
- ABEN faculty participated in many multi-state project groups
- Provided hands-on training on municipal solid waste composting in Bangladesh
- Collaborated with Ag Communications to make seven new farm safety videos
- Organized several demonstrations on composting, new technologies to reduce greenhouse gas emissions and air pollution, vertical tillage equipment performance, and the impact of soil compaction from tractor tracks in corn fields
- Organized public workshops on tile drainage and irrigation
- Provided the public with disaster relief and flood cleanup from Tropical Storm Sandy
- Assisted with ND and MN FFA contests
- Organized and participated in video conferences with two Tashkent universities
A. Goals and Priorities: 2012

- Hire a Permanent Chair
- Increase reputation and visibility of the department
- Develop department’s strategic vision
- Complete Commodity Trading Room
- Hire new faculty to replace faculty lost because of resignations and retirements
- Enhance student learning in both undergraduate programs and graduate programs

B. Executive Summary of Accomplishments in Achieving Goals and Priorities

Professor William Nganje accepted the permanent chair position. He started effectively in April 2013.

The department continues to produce a biweekly news column on “Spotlight on Economics;” intended to provide readers with an update on emerging agribusiness and applied economics issues in teaching, research, and extension. The Department also continues its tradition to highlight its faculty’s accomplishments with “It’s Happening at State” and “The Exchange.” The department continues to advance efforts to increase collaboration with other units within the College of Agriculture, Food Systems, and Natural Resources and with other programs at NDSU and major stakeholders in North Dakota.

A Strategic Plan Committee for was formed to guide efforts to complete the department’s strategic plan document. With the leadership of the chair, a draft strategic plan document is expected by the end of 2013. Two new faculty members were hired to fill voids in farm management and macroeconomics in the department. Both faculty members will start in August 2013.

a. Teaching

- Demand continues to be high for the department’s undergraduate majors and graduate students in terms of job placement and internships. Salaries for our graduates continue to trend upwards.
- Undergraduate Policy Committee continues to coordinate efforts to consolidate 200 level courses to eliminate overlap and increase efficiency in our course offerings.
- Faculty continues to use innovative teaching and assessment methods for both face-to-face offerings and online classes.
- The Commodity Trading Room is up and running, thanks to the leadership of Professor Wilson and major financial donors. This state of the art facility helps increase the teaching of risks and risk management strategies to traditional students and non-traditional students (commodity group members, famers, and ranchers).
- The department continues to have a ratio of produced FTE to budgeted FTE that exceeds two.
- Most MS theses result in peer reviewed journal articles.
- Dr. Siew Lim received the Earl and Dorothy Foster Excellence in Teaching Award from the college.

b. Research, Scholarship, and Creative Activities

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<tr>
<td>Research Grants and Contracts: Cumulative amount</td>
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c. **Service/Outreach/Extension**
   - Extension: Agricultural Lenders Conference (4 sessions)
   - Extension: Crop Insurance Conference
   - Continue work on with ND Tax Department on ND Agricultural Land Valuation Model
   - Extension: More than 200 presentation around the state
   - Dr. Miljkovic: Editor of *Journal of International Agricultural Trade and Development*
   - Dr. Koo served as Co-editor for *Chinese Agricultural Economic Review* and Economic Advisor to the U.S. Secretary of Agriculture and Trade Ambassador
   - Kathleen tweeten was honored by Epsilon Sigma Phi for dedication and service to the organization
   - Timothy Petry received “the Premier Forecaster Award” from the AAEA and was recognized for Excellence at the Agriculture and Faculty Award ceremony in Dec, 2012
   - Dr. William Wilson was invited to the 5th Annual Kraft Lecture as honorary presenter
   - Several other members received honors and awards (Dr. Gregory McKee, Richard Rathge, and Andrew Swenson).

C. **Goals and Priorities for 2013**
   - Increase reputation and visibility of the department
   - Increase stability/excellence by creating one endowed chair position in Cooperatives and initiating two others in Risk Management and Policy/Impact
   - Complete draft of department’s strategic plan document
   - Increase use of Commodity Trading Room by other faculty and units
   - Hire new faculty/staff to replace resignations
   - Enhance student learning in both undergraduate programs and graduate programs
   - Complete Assessment Plan and the 2013 Assessment Report
A. Department/Unit/College Goals and Priorities for the Past Year

• Improve visibility with students, stakeholders, and alumni

• Revamp the departmental web site

• Create an alumni newsletter

• Develop an onboarding process to more effectively integrate new employees into the department

Teaching Goals

• Prepare for accreditation visit for the Veterinary Technology Program

• Fill vacancy created by the promotion of Dr. David Buchanan

Research Goal

• Develop a more sustainable funding model for operation of the Advanced Imaging and Microscopy Laboratory

Extension Goal

• Develop more in-depth training opportunities for county Extension agents

B. Executive Summary of Accomplishments in Achieving the Goals and Priorities

The department was successful in achieving several of our 2012 goals over the past year. Visibility with students, stakeholders, and alumni was improved with the creation of a quarterly alumni newsletter (the first issue was produced at the end of 2012). The department also began a Facebook page which is used to inform alumni, students, and stakeholders about departmental news and upcoming events. The page has over 800 “likes.” The Moos, Ewes & More program attracted nearly 1,000 people in September, 2012. The department’s web site was revamped within the Ag CMS guidelines in 2012. A departmental onboarding process was developed to ensure new employees are equipped with the information they need to successfully begin their careers at NDSU. A new scholarship was developed (Paul Berg Scholarship) and funded through generous donations from alumni.

Teaching: The department’s Veterinary Technology Program will undergo an accreditation review in 2013. Program staff began preparing for the review in 2012. The program’s co-directors have responsibility for preparing the reports and other documentation required by the review team. A search was conducted and interviews held for the Genetic Improvement of Livestock faculty position. The Animal Sciences major underwent a major curriculum overhaul in 2011. Department faculty members continue to implement changes which were part of the curriculum revision. Students in the Animal Sciences major are now required to participate in a research or internship experience as part of the curriculum. Students returning from their internships give presentations in ANSC 150 (Orientation) in order to better acquaint the freshmen students with internship opportunities. Departmental faculty members Drs. Newman and Dahlen initiated a foreign travel course in which 19 students traveled to China for two weeks to learn about Chinese agricultural production systems. Department faculty members won the ASAS Fellow Award in Teaching (David Buchanan) and the NDSU Service Learning Award (Erika Berg).
Research/Scholarly/Creative Activities: Department faculty members received numerous grant awards from federal and state agencies, commodity groups, and industry partners. The NDSU Beef Cattle Research Complex was in its first full year of operation in 2012. Faculty members continue to develop data acquisition and sorting procedures which will allow more accurate and useful handling of data generated by the feeding system. Robert Maddock won the American Meat Science Association Achievement Award.

Service/Extension/Outreach: Extension faculty in the department have developed additional in-depth training for county and area Extension personnel. In 2012, department faculty provided a two-day workshop related to livestock nutrition. The curriculum included classroom activities related to livestock nutrition, feeds and feeding, and ration balancing. Laboratory activities included farm visits and assignments related to the development of specific feeding recommendations for each producer. This improved the ability of Extension personnel to respond to commonly asked questions about livestock nutrition. This programming effort won a Program Excellence Award from the NDSU Extension Service.

In 2012, the department hired a tenure track specialist in the area of Livestock Stewardship. This position will work with the livestock industry on educational programs related to animal care and husbandry, stewardship, and management.

Service: In 2012, the department hosted the Reciprocal Meats Conference. This event serves as the annual meeting for the American Meat Science Association. Approximately 800 people attended the conference in Fargo. Departmental faculty and staff served as session organizers, hosts, and coordinated meeting logistics.

Dr. Kim Vonnahme served as a director-at-large for the American Society of Animal Sciences. Dr. Greg Lardy served as President-Elect of the American Society of Animal Sciences.

C. Department/Unit/College Goals and Priorities for the Coming Year

Overall Departmental Goals:
- Hold the first-ever NDSU Animal Sciences Alumni Reunion
- Hold a departmental retreat which focuses on planning for the future
- Form an alumni advisory board to assist with fundraising for support of the NDSU Judging Teams

Teaching Goals:
- Prepare for and successfully navigate the Veterinary Technology Program’s Accreditation Review
- Develop a plan for effectively staffing our ANSC 150 and ANSC 189 courses

Research Goals:
- Implement the plan for improving the sustainability of the AIM Laboratory
- Continue to seek improvement in the internal grant submission and approval process

Extension Goals:
- Develop a needs assessment for county Extension staff related to livestock programming
- Develop additional programming materials which county staff can use for educational programs

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A. Department/Unit/College Goals and Priorities for 2012: The School of Food Systems is a collaborative teaching, research, and outreach unit in the College of Agriculture, Food Systems, and Natural Resources. The School’s academic and research programs in Food Science, Cereal Science, and Food Safety were intended to provide an interdisciplinary platform for faculty, staff, students, and their collaborators to address stakeholder concerns and to achieve its mission, “to provide solutions to food systems challenges and opportunities by engaging in interdisciplinary research, education, and service.”

B. Executive Summary of Accomplishments in Achieving the Goals and Priorities for 2012:

a. Teaching
   - In 2012, teaching assignments were redistributed as a number of personnel changes impacted the SFS through retirements, resignations, faculty members changing job descriptions, etc. Dr. Peter Bergholz was hired in 2012 with funds through Distance and Continuing Education and the Provost’s Office to teach 3 of the core modules in the Food Safety curriculum and to develop other courses that complement Food Safety, Microbiology, and Genomics programs.
   - Dr. Hall employed a ‘flipped’ classroom approach in the Food Processing course that integrates student learning in a practical approach to food processing and preparation.
   - Industry contacts have stressed that in order to be competitive for employment, Food Science students should be HACCP certified. Dr. Robert Maddock teaches the HACCP certification class (SAFE 494), which will be even more important in the future as it is our intent that certification will become a required component of the program.
   - In an effort to grow the student enrollment through international partnerships, the collaboration with Zhejiang Economic Trade and Polytechnic Institute (ZJETP) to enroll B.S. degree Food Safety students at NDSU after completion of their studies at ZJETP. It is intended that these students will begin enrolling in the online NDSU core courses in the fall of 2013 (while still in China) and arrive in Fargo as students to take face-to-face courses in the fall of 2014.

b. Research/Scholarly/Creative Activities
   - Both SFS and Plant Sciences faculty obtained funds from commodity boards including the Soybean Council, National Pulse Growers, and Pea and Lentil Council, as well as through industry funding including SunOpta, Bush Beans, and Malt-o-Meal. However, consistent funding to support Food Safety research on campus has been difficult to maintain.
   - Drs. Dilrukshi and Pushparaj Thavarajah also focused on health and food security related projects through domestic and international collaborations. Dr. Dilrushi Thavarajah established a new Pulse Quality and Nutrition Laboratory. Research synergisms are expected with the new Global Institute of Food Science and International Agriculture (GIFSIA).

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c. Service/Extension/Outreach
   - Service
   - While outreach and service was widely varied among the faculty and in the programs, one important highlight was the outreach effort to the five ND Tribal Colleges through the NATURE summer program that brings summer interns into the SFS laboratories. Drs. Hall and Myers joined with teachers from Sitting Bull College and Four Winds Community...
School to create a session on “Science and Tradition of Meat Safety and Preservation” for the NATURE Sunday Academy. In addition, Dr. Myers coordinated the USDA grant that provides funds to recruit Native American students to major in Food Science. These funds have provided the Food Science Program with two USDA Fellows who will matriculate to NDSU to complete their B.S. degree in Food Science after they complete their two years at Turtle Mountain Community College.

- With the establishment of GIFSIA there will be increasingly more opportunities to provide Food Safety education internationally, as well as regionally.
- Recognitions: Dr. Myers served as the President of the American Oil Chemists Society, Dr. Hall served as the Interim Technical Director of the Northern Crops Institute, the Vice President of the Flax Institute of America, and on the Editorial Boards for the American Oil Chemists’ Society and the Bean Institute

C. Department/Unit/College Goals and Priorities for 2013: “The vision of the School is to advance the knowledge and understanding of the effects of production, storage, and processing of raw commodities on the availability of safe, secure, high quality and marketable foods.” 2012 was a challenging year for the School, with constraints of extramural funding for some programs, limited space for teaching and research endeavors, as well as considerable personnel turnover. However, even in the face of these significant ‘behind the scenes’ challenges, the academic programs administered through the School trained and taught the interdisciplinary skills that are necessary for a new group of food scientists to tackle the challenges they will face in providing “safe, secure, high quality, and marketable foods” for a growing world population.

In early 2013, Dr. Deland Myers resigned his leadership of the School to step back into the faculty. His strengths in teaching and student mentoring are expected to be a great asset to the academic programs going forward. At the beginning of the 2013 fiscal year, The School of Food Systems was consolidated with the academic programs in Food Science and Cereal Science being administered through Plant Sciences. Dr. Cliff Hall will provide program leadership as the coordinator for the Food Science undergraduate program. A new Graduate Program Committee has been constituted for the Cereal Science graduate program to provide coordination and leadership for the didactic, training, and assessment aspects of the M.S. and Ph.D. degree programs. Leadership of the Great Plains Institute for Food Safety (GPIFS) is currently being sought with a goal to maintain the interdisciplinary structure of the GPIFS and to strengthen the scope and pool of expertise.
A. Department/Unit/College Goals and Priorities for the Past Year

1) Develop cohesion in the School, which was formed in 2008: We encouraged collaborations across units with activities such as creating common Learning Outcomes and sharing available resources (e.g. NDAES GRAs, equipment funds, personnel). Other activities, including Program Review and an SBARE presentation helped us to become more cohesive.

2) Promote underrepresented faculty: As a result of recent hires, Soils is now 2nd in NRC-reporting programs for percent female faculty. Entomology is 33% female (about 30th percentile), and NRM is 25% female which is 4th ranked among NRC reporting programs. Additionally, Dr. Prischmann was awarded a course release grant from FORWARD to aid her in her promotion. Also, Marion Harris is still one of only a few female, full professors in the College & University, and her mentorship to underrepresented faculty is invaluable.

3) Benchmark the School’s accomplishments using key metrics reported in NRC data:
   i. Program size (full-time faculty): Soils = 10 (~50th PCTL), Range = 3 (30th PCTL), Ent = 6 (~5th PCTL), NRM 4 (10th PCTL)
   ii. % Female faculty: Soils = 20% (2nd highest), Range = 0 (20th PCTL), Ent = 33% (~35th PCTL), NRM 25% (3rd highest)
   iii. PhDs conferred (Average number over last 5 years): Soils = 0.2 (~5th PCTL), Range = 0 (~18th PCTL), Ent = 1.4 (~12th PCTL), NRM 2 (20th PCTL)

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities for this Past Year which include the following areas:

a. Teaching

   • Changes: In response to recent assessment feedback, the School’s faculty developed common main learning outcomes (MLO) across the School’s four programs. The first MLO developed and assessed was “Managing Land for Sustaining Natural and Agricultural Systems.”

   • Progress: Learning Assessment approaches were used in one course from each program (NRM/RNG 453, RNG 456, SOIL 410, and ENT 431) to determine students’ abilities to apply higher-level thinking to the MLO. Higher-level learning outcomes (Levels 3 and 4) were sought during the semester. Desired outcomes were 1) improved understanding of the power of assessment techniques, 2) development of leveled-learning outcomes (LLOs) for other courses and improvement of current LLOs, and 3) modification of methods based on the assessment feedback.

   • List new initiatives...: Using Maki (2010), instructors developed LLOs for each of the assessed courses. Leveled-learning outcomes were designed to gauge the level of student knowledge as they progressed from lower-order (knowledge, comprehension) to higher-order (application, analysis, synthesis, evaluation) skills. Bloom’s taxonomy action verbs (1954) were used to formulate each outcome. Each instructor evaluated at least one LO from each of their four levels.

b. Research/Scholarly/Creative Activities

   • Major research accomplishments or recognitions
     o The publication rate of Entomology faculty is ~50th PCTL of NRC reporting Entomology units. For Soil Science, the publication rate is 2nd among NRC reporting Units.
     o Tom DeSutter was recipient of Larson/Yaggie Excellence in Research Award.
     o Jason Harmon was awarded a multi-million dollar NSF proposal, and Dave Franzen was co-PI for a NSF proposal to work on active-optical sensor in crops. Additionally, Stephen Foster wrote a successful pre-proposal for NSF-IOS. From 2002-2013, NSF Fastlane indicated the
number of NSF proposals funded to School units is highest in CAFSNR and only 3 departments at the university have more.
  o Applied research in areas such as iron fertilizers, fertilizer recommendation and additives, and sugarbeet pests has major impact on North Dakota’s economy.

- Significant additions to research capability
  o The $2.2M ND Legislative initiative, “Soil Health and Land Management,” has had a major impact on the School. As a result two assistant professors and one research specialist were hired in the School in 2012.

<table>
<thead>
<tr>
<th>Peer Reviewed Publications (published or accepted)</th>
<th>Total</th>
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<tbody>
<tr>
<td>National or International Invited Presentations</td>
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<td>Cumulative Amount (total value of active grants and contracts):</td>
<td>$4,256,667.68</td>
</tr>
</tbody>
</table>

c. Service/Extension/Outreach

c1. Extension/Outreach

- The five School personnel with Extension appointments:
  o Led 14 workshops and/or tours that reached an audience of approximately 1,000
  o Made 80 presentations that reached an audience of 3,620
  o Provided ninety TV, radio and print media presentations

- The Extension Communicator of the Year award was given to Joe Zeleznik

- Dr. Abbey Wick has directed the formation of the Soil Health and Land Management Team’s Extension efforts. She helped create the Soil Health Agriculture Research and Extension (SHARE) Farm to demonstrate soil health activities. She also created the Team’s new website and coordinates the Advisory Group to solicit stakeholder input.

c2. Service

- School faculty served on 7 editorial boards, reviewed 64 publications, served on 4 grant panels, served as Panel Manager for NIFA-AFRI, provided 7 external evaluations for PTE/promotion evaluations, served as expert advisors, and participated in international activities including Thailand, Chile, and Kazakhstan.

C. Department/Unit/College Goals and Priorities for the Coming Year

1) Successfully complete Program Review Self Study Report for all programs in the School
2) Develop common Learning Outcomes for all units in School
3) Hire key personnel
4) Encourage/promote improved ranking in key areas of publications, diversity, and PhD conferrals
5) Continue to promote cohesion across School units in research, advising, curriculum, and extension activities.
Department of Plant Sciences

A. Department/Unit/College Goals and Priorities for the Past Year.

Complete the reviews of the department’s undergraduate programs. The reviews have been completed for the Crop and Weed Sciences (CWS), Horticulture (HORT), and Sports and Urban Turfgrass Management (SUTM) programs in the department. Based on preliminary information from the reviews, possible outcomes include suspension of teaching PLSC 350 ‘Sugarbeet Production’ until the department has additional faculty, merging of the science and biotechnology options of HORT into one option, creation of a landscape management option for HORT, and rolling the SUTM program into HORT as an option.

B. Executive Summary of Accomplishments in Achieving the Goals and Priorities.

a. Teaching

The Department of Plant Sciences continues to be the largest department on campus, with over 40 faculty and nearly 130 full-time employees. The enrollment in Plant Sciences programs set an all-time high with 244 students (197 in CWS, 29 in HORT, and 18 in SUTM). The CWS program has more than doubled in four years, from 98 students in 2008 to 197 in Fall Semester 2012. The increases in the CWS program are driven by strong employment opportunities in the region. Many of the CWS students have multiple job offers following graduation. The graduate student enrollment in the Plant Sciences MS and PhD programs and the HORT MS program is also strong, with over 70 total students in all degree programs.

While the enrollment increases are exciting, they do cause challenges, including the need to add extra sections for courses such as PLSC 225 ‘Principles of Crop Production’ and PLSC 491 ‘Senior Seminar’ without additional funding. Also, courses with lab components, such as PLSC 110 ‘World Food Crops’, PLSC 315 ‘Genetics’, and PLSC 320 ‘Principles of Forage Production’ are busting at the seams and students often are unable to enroll in these courses when they wish because they are full. Another factor that impacts the CWS program is the loss of the position formerly occupied by Dr. Shane Friesen. This position was swept by interim President Hanson to help in covering the University’s budget shortfall and urgently needs to be returned.

New Teaching Labs Required. Because of the need to add lab sections to several courses in the Department there is an immediate need to find more space to teach these sections. There are plans to add two new teaching laboratories in Loftsgard Hall by remodeling the space where growth chambers are currently housed. By the end of 2013 plans and diagrams for the two labs are to be ready so they can be submitted to the University for approval. Dr. Hatterman-Valenti has been asked to lead this effort.

New and Deleted Courses. There is a great need for a graduate student crop physiology course in the College. Our plant sciences graduate students do not have any physiology courses available to them, and it is a sad commentary that students are graduating with MS or PhD degrees without this type of course. In response, Dr. Zhang has developed PLSC 750 ‘Crop Stress Physiology’ which will be offered in Spring semesters of odd years, beginning in 2013.
b. Research/Scholarly/Creative Activities

Major research accomplishments or recognitions
- Dr. Mike McMullen released Jury oat, which will provide growers with a high yielding and quality disease resistant cultivar.
- Dr. Mohamed Mergoum was named a Fellow in the American Society of Agronomy and also released Elgin hard red spring wheat.
- Dr. Elias Elias was named a NDSU Distinguished Professor and also released Carpio durum.

| Peer Reviewed Publications (published or accepted) | 123 |
| National or International Invited Presentations | 150 |
| Juried presentations/performance/exhibitions | |
| Research Grants and Contracts (number that are active) | 187 |
| Cumulative Amount (total value of active grants and contracts): | $12,079,207.00 |

c. Service/Extension/Outreach

c1. Extension/Outreach

The Dragon Fly Garden at the United Tribes Technical College is a new research and demonstration site for gardeners in the region. Designed and established by NDSU under Dr. Tom Kalb’s leadership, the garden displays the state’s most diverse collection of hardy trees, fruits, and roses. The garden has already had regional and international impact and been visited by Tribal leaders and groups ranging from Canada to Kosovo.

c2. Service

- Dr. Marisol Berti is the Editor-Chief of the Industrial Crops Journal.
- Dr. Xiwen Cai was the local organizer for International Triticeae Mapping Initiative and National Wheat Genomics Committee Joint Workshop.
- Dr. Rod Lym organized the annual meeting of the Weed Science Society of America and became the Society President.

C. Department/Unit/College Goals and Priorities for the Coming Year

Begin reviews of the department’s graduate programs. The Department does not have any programs of emphasis in the graduate curriculum. Logical programs of emphasis would be in plant breeding and genetics and possibly weed science. In 2013 the curriculum in the areas of plant breeding and genetics will reviewed to determine if any areas should be designated as programs of emphasis.

 Consolidate the Cereal Science graduate program into Plant Sciences. If this program is consolidated into Plant Sciences, a faculty member will be appointed as the director of the graduate program and a curriculum committee specific to this graduate program will be established. Under advisement from current and former faculty, the Industrial Agriculture Advisory Board comprised of stakeholders will be reinstated. This will be done to increase awareness of the program and learn how our graduate program can serve the needs of stakeholders.
A. Department/Unit/College Goals and Priorities for the Past Year:

Goals for 2012 included:

- Meet core departmental mission of conducting research, teaching and extension activities on economic plant diseases in the state.
- Integrate new faculty members (Drs. Knodel, Pasche and Liu) into the department.
- Conduct formal evaluations of two faculty submitting portfolios for promotion to Associate Professor with tenure and of one faculty member submitting a portfolio for the 3rd year review.
- Complete the scheduled departmental program review.
- Continue efforts to enhance the graduate program.
- Continue efforts to solve long-standing laboratory and office space constraints.

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities for this Past Year which include the following areas:

a. Teaching

Departmental assessment document was revised under leadership of Dr. Meinhardt and approved by university assessment committee. First assessment report submitted under this new document. Several graduate-level courses were both updated to improve content and keep the courses up to date with state of the discipline.

Dr. Pasche taught fungal biology for first time to enrollment of 23.

- Progress that has been made in successfully implementing past initiatives.
- List new initiatives, innovative teaching approaches (providing evidence of quality improvements in teaching and learning and important recognitions.

Dr. Brueggeman instigated a student presentation series geared toward the most recent work in molecular plant pathology and began a mini grant proposal assignment where students wrote grants and served as peer review panel. He teaches the 700-level Host-Parasite Genetics.

Dr. Secor taught Plant Viruses and Virus Diseases at University of Concepcion, Chillan, Chile in an intensive two week course for graduate students and agriculture professionals using a combination of lectures, labs and demonstrations.

Several faculty initiated assessment activities to accommodate changes in the departmental plan.

b. Research/Scholarly/Creative Activities (tabulate totals in table)

- Major research accomplishments or recognitions

Dr. Gudmestad was an invited speaker at the 8th World Potato Congress held in Edinburgh, Scotland in May, 2012, speaking about the economic importance of invasive potato pathogens using zebra chip as a model. He and four of zebra chip colleagues were awarded the Entomological Society of America “Team IPM Award”, the second highest award of this professional society.

Dr. Brueggeman received an NSF-CAREER award ($623,363 over five years). He also identified the only known barley resistance to Ug99 form of the stem rust fungus.

Dr. Nelson reported the first occurrence of sugarbeet cyst nematode in the state. He also identified the first sources of genetic resistance against soybean cyst nematode in dry bean.

Dr. LeBoldus received his first competitive NIFA grant and developed a high throughput genotyping protocol for fungi.

Dr. Zhong was a lead in the genome project for the fungal pathogen *Cochliobolus sativus*.

Dr. Acevedo found new sources of genetic resistance to various rust pathogens of wheat and was a key international player in the fight against Ug99.

Dr. del Rio identified several Sclerotinia genes activated during infection of canola and developed host mapping populations against blackleg.

Dr. Pasche helped establish research laboratory by recruiting two female graduate students, one a
recipient of NSF support and the other a graduate of Virginia State University.

Dr. Secor found a new bacterial disease of sugarbeet in the state and characterized and named a new species of Fusarium that affects sugarbeet. He also received the Distinguished Service Award from the Sugarbeet Industry of Minnesota and North Dakota.

Dr. Markell had a refereed publication designated the “editors pick” of the month.

Dr. Khan demonstrated effective new fungicide control of several sugarbeet diseases.

- **Significant additions to research capability**

Dr. Brueggeman led a group of departmental faculty in purchase of Ion Torrent DNA sequencer (next generation sequencing). Several new technicians and support staff were hired. Several new pieces of field machinery were added by Drs. Markell and Knodel.

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<tr>
<td>Peer Reviewed Publications (published or accepted)</td>
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<td>National or International Invited Presentations</td>
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<td>Juried presentations/performances/exhibitions</td>
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<td>Research Grants and Contracts (active)</td>
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<tr>
<td>Cumulative Amount (total value of active grants and contracts):</td>
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c. **Service/Extension/Outreach**

- **Extension/Outreach**

Dr. McMullen retired in late 2012, ending an illustrious and decorated career as a small grains Extension pathologist. Prior to retiring, Drs. McMullen and Markell ran the Eastern and Western Scout Schools in the spring. Dr. Knodel transferred to the department as a tenured Associate Professor and took responsibilities for all IPM activities in the state. Faculty gave at least 103 Extension talks through the course of the year. In addition, Extension faculty produced at least 11 Extension bulletins and other related publications and assorted videos, webinars and other forms of communication.

- **Service**

Dr. Gudmestad served on a grant review panel for USDA-NIFA-SCRI. Dr. Brueggeman was Vice Chair of the National Barley Improvement Committee, Chair of the US wheat and barley scab initiative barley coordinated project, Co-Chair of organizing committee of the International Triticeae Mapping Initiative workshop and a member of the National Science Foundation SDS Plant review panel. Dr. Nelson was Chair of the CAFSNR Promotion and Tenure Committee and Senior Editor for Plant Disease: An international Journal of Applied Plant Pathology. Dr. Zhong was member of Editorial Board of The Open Mycology Journal and members of three APS committees (Genetics, Mycology, Host Resistance). Dr. Acevedo was selection panel member for Women in Triticum Early Career Award. Dr. LeBoldus was Secretary of NCERA-224 and is organizing the 2013 meeting. Dr. Secor is Chair of the Editorial Board, Focus on Potato. Dr. Knodel was member of the C.V. Riley Award Committee of the Entomology Society of America and of the Strategic Planning Committee for the same organization. Dr. Markell was a member of the NIFA grant review panel on Integrated Pest Management. Dr. Khan serves as Vice Chair of the Extension General Policy Committee of APS. Dr. Rasmussen chaired searches for the Associate Dean of the College and Assistant Dean of the College and was a member of the search committee for the Assistant Director of Extension.

D. **Department/Unit/College Goals and Priorities for the Coming Year**

1. Complete partial remodel of some offices, labs and teaching facilities in Walster Hall.
2. Hire a nematologist into the faculty.
3. Orient new small grains extension faculty member into department, college and university.
Veterinary and Microbiological Sciences

A. Department/Unit/College Goals and Priorities for the Past Year

(This has been by calendar year in the past, but is now required by fiscal year. The reporting period is July 1, 2012 - June 30, 2013, with a due date of July 15. Let it be noted that VMS is shortchanged acknowledgement of six months’ worth of activity. Also, the information for January 1-June 30 may be incomplete due to the challenge of compiling through June activities in early July, when many are on vacation, including the department head. It should be noted that this reporting timeframe is not family friendly)

The department welcomed five new faculty. This involved modifications to the building, shared equipment, implementation of startups and mentoring approaches. VMS faculty and staff hosted the North Central Branch ASM meeting. The department continued to update and maintain the best website. We continued building upon the VMS academic roadmap – The Microbiology Pipeline. The faculty were supported by outstanding staff, including the 2012 Donald and Jo Anderson Staff Award winning Sandy Erickson.

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities for this Past Year which include the following areas:

a. Teaching (and advising)
   • Figures 1 and 2 depict loads and programs supported
   • Developed and submitted outcomes for all active degrees managed by department.
   • Implemented new track for the MPH degree
   • Placed the IDM program on temporary suspension to resolve issues with partner institution.
   • Implemented new approach for assessment reporting
   • Hosted pilot of disciplinary writing consultant program for CAFSNR
   • Awards
     o NDSU Bison Ambassadors’ Apple Polisher Award - Gene Berry
     o 2013 NDSU Outstanding Faculty Advising Award – Janice Haggart (Tom Gustad and Rachel Richman also nominated by students)
     o 2013 CAFSNR H. Roald and Janet Lund Excellence in Teaching Award – Janice Haggart
     o 2013 CAFSNR William J. and Angelyn A. Austin Excellence in Advising Award – Rachel Richman
     o 2013 USDA/APLU National Teaching Award – Janice Haggart

b. Research/Scholarly/Creative Activities (tabulate totals in table)
   • Major research accomplishments or recognitions
     o 2010-2012 – NDSU Engberg Endowed Professorship – C. Wolf-Hall
   • Significant additions to research capability – Added five faculty, new equipment, modified shared spaces, enlisted a disciplinary writer, and promoted mentoring.

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<tr>
<td>Cumulative Amount (total value of active grants and contracts):</td>
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</table>

*We have included state and regional as these are important for our departmental impact
c. Service/Extension/Outreach

1. Extension/Outreach
   - NA

c2. Service - Let it be noted that VMS faculty serve extensively on committees at all levels, without service appointments, and often without much thanks
   - CAFSNR – Haggart, J. - Honor Commission Advisor and Student Progress Committee; McEvoy, J. – Chair Curriculum Committee; Pruess, B. – Chair Faculty Development Committee; Schuh, J. – Chair Ad-Hoc committee for load and overload guidelines, Chair search committee for Public Information officer
   - NDSU - Berry, G. - Chair Radiation Safety Committee; Prüß, B.M. – President Elect of Faculty Senate as of May, 2013; Schuh, J. – Chair ad hoc committee for research/faculty budget committee
   - Regional - Prüß, B.M. – President of North Central Branch-American Society for Microbiology
   - National - Khaitsa, M.L. – One Health Committee of Association of American Veterinary Medical Colleges as the chair-elect, July 2012-present
   - International – Khaitsa, founder East African sister organization for Higher Education Resource Services (HERS); Wolf-Hall, C., officer (Past-President) for Gamma Sigma Delta – The Honor Society for Agriculture, 2012-2014

c3. Administrative appointments or duties of faculty
   - CAFSNR Assistant Dean – Schuh, J.
   - Coordinator Biotechnology Program – Berry, G.

C. Department/Unit/College Goals and Priorities for the Coming Year

In the interest of allowing enough time for reflection and discussion for development of useful and functional goals, VMS is holding a full-day faculty retreat on August 14, at which time goals for the year will be articulated. We will be sure to share those up the chain of command once ready.

Figure 1. FTE Ratio Trends for VMS

![FTE Ratio Trends for VMS](image1)

Figure 2. Academic Programs in VMS

VMS Academic Programs

- Microbiology Minor, B.S. and M.S.
- International Infectious Disease Management and Biosecurity M.S. and Graduate Certificate
- Management of Infectious Disease Track of M.P.H. and Graduate Certificate
- Molecular Pathogenesis Ph.D.
- Support Interdisciplinary Programs
  - Biotechnology
  - Cellular and Molecular Biology
  - Environmental and Conservation Science
  - Food Safety
  - Genomics & Bioinformatics
  - Natural Resource Management
NDSU-Veterinary Diagnostic Laboratory

A. Department/Unit/College Goals and Priorities for the Past Year: Primary goals for the past year included successfully completing the laboratory-wide audit performed by our parent organization, the American Association of Veterinary Laboratory Diagnosticians; continuing to develop and provide expertise for livestock-related health issues that arise in the North Dakota oilfield; enhancing our offering of tests based on molecular technology (PCR); and developing stronger relationships/partnerships with commodity groups (North Dakota Stockman’s Association, North Dakota Farm Bureau) and public/animal health organizations around the state (North Dakota Board of Animal Health, North Dakota Department of Health, and North Dakota Game and Fish).

B. Provide Executive Summary of Accomplishments in Achieving the Goals and Priorities for this Past Year which include the following areas:

a. Teaching

• Dr. Dyer: MICR 465/665; MICR 372 (on-line), MICR 374 (on-line), MICR 376 (on-line), MICR 371 (on-line), VETS 387
• Dr. Newell – MICR 494 – Pathology Rounds
• Teaching from the VDL is unique in that it offers a case-based approach to animal health. Students are exposed to a variety of real-world scenarios that give them instruction on animal health problems they will encounter during their careers. In addition, the VDL often provides students with necropsy experience. They are able to view actual lesions and understand the pathogenesis of various disease processes.

b. Research/Scholarly/Creative Activities (tabulate totals in table)

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c. Service/Extension/Outreach

c1. Extension/Outreach

• Dr. Mostrom – numerous meetings with producers and state officials regarding the potential for petroleum toxicosis in livestock in the North Dakota oil patch. The NDSU-VDL toxicology laboratory is in the process of developing assays that will allow detection of petroleum in rumen contents.
• Dr. Dyer – presenter for NDSAs Cattleman’s College (11/27/12)
• Dr. Dyer – “Why West Nile virus now?”, Fencepost column for NDSAs magazine
c2. Service

- Dr. Dyer – veterinary pathology lecture and laboratory instruction, School of Veterinary Medicine, Mongolian State University of Agriculture, Ulaanbataar, Mongolia, 9/29/12 – 10/13/12

C. Department/Unit/College Goals and Priorities for the Coming Year

d. Hire a full-time veterinary microbiologist to oversee the bacteriology/virology sections of the lab

e. Obtain funding for IT, QA and molecular technician positions at the VDL

f. Continue to promote the need for a new VDL

g. Continue to be responsive to the needs of the VDL clientele. In particular, perceived needs in the North Dakota oilfield, testing required for livestock export, public health surveillance and ongoing changes in the companion animal health.
Agriculture Communication

Goals and Priorities from 2011-12 Annual Report

- Complete landing pages and delete or update online publications older than 2006 – Landing pages created for 700 new and updated publications at www.ag.ndsu.edu/publications.
- Work with NDSU International Programs to translate some newsletters into Spanish – A Plant Sciences graduate student translated two publications and Parenting Posts newsletters.
- Explore fungicide, insecticide, herbicide and weed control guides for mobile technologies – An app apparently is being developed without Ag Comm involvement.
- Facilitate a meeting of departmental and REC communications and technology support staff to share ideas and make them aware of Ag Comm resources – Hosted discussion with about 15 departmental representatives in August.
- Modernize the look of publication PDFs (often with color and photos) and design as more Web-friendly – Graphic designers are providing more modern design, usually in full color.
- Explore e-pubs and mobile technology to make information easier to use on tablets and smartphones – Ag CMS went live with automated mobile-friendly features March 17. E-pubs are still being explored, but mobile-friendly is more functional and user friendly.
- Develop a template for Extension agents and specialists that will assist them in marketing their programs to targeted audiences – When an Extension branding task force is named, Ag Comm will work with them on this.
- Work with other communications professionals on campus to develop news media lists we all can share when sending out news releases, media advisories, etc. – Ag Comm staff met with University Relations representatives, but each agreed to continue using its own news release lists.
- Increase use of online personal learning networks for workplace learning within NDSU Agriculture – Use of various social tools increased an average of 7% over last year.
- Increase the number of NDSU Agriculture employees with 20 or more work-related online connections – This increased an average of 14% over last year.
- Work with NDSU administration to explore all campus printing and copying coming through Print and Copy Services (PCS) – Becky Koch met with VP Prakash Mathew, who clarified that Policy 407 cannot require campus auxiliary services to be utilized.
- Market Print and Copy Services options in a variety of ways on campus and to other state agencies – A calendar and bookmarks were provided to all campus units. Emails and personal contacts marketed services to campus, N.D. Soybean Council, N.D. Corn Commission and others.
- Explore and initiate variable data printing to personalize Print and Copy Services work – Research has determined that merging personalized information first then sending the entire document to the production center works better than merging it on the fly.
- Start using a remote system to get monthly readings from walk-up copiers around campus for billings – The remote system reports the number of b&w and color prints from each machine each month, but it can’t separate the various access codes, which are required for billing.

Major Accomplishments of the Past Year

Teaching

- Led Communications Camp for Family and Consumer Sciences agents and specialists Dec. 3-5
- Taught many sessions related to communications and technology at Extension/REC Fall Conference, Association for Communication Excellence (ACE)/National Extension Technology Conference and Extension Disaster Education Network meeting
- Shared how to develop key messages and distribute them at Extension orientations
- Taught 4-H Filmmaking for Extension Youth Conference
- Taught video production at Southwest District Extension meeting
- Provided information via Let’s Communicate, and Web Services Facebook page and blog
• Edited and designed several Family and Consumer Sciences packaged programs
• Led F2F, live and archived Intro to Ag CMS and recorded three Online Learning webinars
• Continue to update Ag CMS How-To Guide and add video how-to’s

Research/Scholarly/Creative Activities
• Created a sign-off chart for multiple PCS deliveries rather than signing individual job tickets
• Streamlined PCS billing processes with a single spreadsheet, simpler uploads and more

Service/Outreach/Extension
• Started Sound Ag Advice podcast targeted to radio stations; will be promoted to public in August
• Produced several high-quality publications, including Annual Highlights, Ag legislative materials, 4-H camp renovation materials and more
• Created posters, video, news releases and NDACo article on Morrill Act anniversary
• Worked on major overhaul of Gearing Up for Kindergarten with editing and graphics
• Produced videos on spider mites in soybeans and corn, pesticide training, seatbelt safety, gerontology nursing, recruiting Native Americans into nursing and more
• Created video content for a Moodle course for ag lending institution staff
• Produced live streaming of State of the University address and winter and spring commencements
• Produced seven award videos for Development Foundation and Alumni Association
• Produce a monthly video segment for University of Nebraska “Market Journal” program
• Distributed 142,419 printed publications and processed 60 new publications
• Sent 5,652 SpeeDee and UPS packages, processed 100 bulk mailings, handled 27,508 mail pieces
• Started using self-adhesive, pressure-sensitive foam core board for mounting posters/signs
• Developed Facebook graphics for Extension offices to provide a professional, consistent look
• Chunked several large publications for the Web by breaking them into separate PDF sections
• Completed transitioning all Ag CMS websites to Plone 4 with the NDSU template
• Designed and printed graphics to update displays at the Northern Crops Institute
• Hosted N.D. FFA Ag Communications career development event
• Communications Camp won ACE silver award for technology education
• Ellen Crawford received second for news reporting and Becky Koch received first in audiovisuals, electronic manuals/handbooks, website development and magapaper/tabloid in National Federation of Press Women (NFPW) communications contest
• Ellen Crawford serves as NFPW treasurer, and Becky Koch started term as ACE president

Goals for 2013-14
• Accept Extension/REC Conference proposals online via Google Drive or a similar online system
• Establish best practices and step-by-step guidelines for creating ADA-accessible PDF files
• Develop an email list specifically with ag media contacts
• Produce six financial disaster recovery videos for national use
• Develop a video for the 100th anniversary of the Smith-Lever Act and NDSU
• Produce three pesticide safety videos for the N.D. Department of Agriculture
• Develop Digital Storefront so PCS pricing is per completed product (not price per click + paper)
• Develop templates in Digital Storefront for postcards, trifolds and other standard PCS products
• Develop short how-to videos to illustrate PCS processes and a monthly email tip/marketing idea
## Appendix 1 (Grants and Contracts)

### Agricultural and Biosystems Engineering

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### Animal Sciences

#### Active Research Grants

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<td>Berg, E.P. and K.A. Vonnahme. Use of young female gilts as a biomedical model of human females to</td>
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<td>determine if consumption of beef from cattle administered estrogenic growth promotants results in</td>
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<td>specific down-regulation of insulin receptors.</td>
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<td>Caton, J. Effects of maternal nutrition and rumen protected arginine supplementation on ewe and</td>
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<td>Dahlen, C.R. and J.C. Hadrich. The 2012 North Dakota beef industry survey; today, tomorrow, and</td>
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<td>Grazul-Bilska, A.T. Acquisition of laser microdissection and pressure catapulting system (LMPCS)</td>
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<td>Lepper, A.N., P.T. Berg, and E.P. Berg. Effects of post-mortem aging on sensory characteristics,</td>
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<td>Newman, D. Novel feeding strategy to improve feed efficiency and decrease cost of production for</td>
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<td>UC Davis Bridging Funds, NDSU Bridging Funds. $25,000.</td>
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<td>Reynolds, L.P. and J.S. Caton. Metabolites of 1-C metabolism and programming of fetal and offspring growth and development by maternal nutrition.</td>
<td>NDSU Bridging Funds. $25,000.</td>
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<td>Stoltenow, C.L. B. Neville, and J. Seeger. Concurrent application of Nuplura, BRD Shield or One Shot to spring born beef calves in north central United States.</td>
<td>Pfizer Animal Health. $20,000.</td>
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<td>Swanson, K. and M. Bauer. Influence of time of feed consumption on feed efficiency in backgrounding calves.</td>
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<td>Swanson, K. M. Bauer, C. Dahlen, and J. Caton. Factors influencing feed intake and efficiency in backgrounding calves fed medium-quality hay with or without increasing levels of supplementation.</td>
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<td>Vonnahme, K. et al. Effects of gestational plane of nutrition and MP level on maternal and fetal outcomes.</td>
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<td>Wagner, S. The effect of banamine on standing and lying behavior after hoof trimming.</td>
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**Other Funding Activities**

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<td>Caton, J.S. Improving ruminant use of forages in sustainable production systems for the western U.S.</td>
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<td>Grazul-Bilska, A. Enhancement of reproductive parameters in domestic livestock.</td>
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<td>Grazul-Bilska, A.T. To determine (1) the role of the nitric oxide (NO) system in ovarian function in normal and compromised females, and (2) strategies to reverse compromised ovarian function.</td>
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<td>Redden, R.R. Increasing efficiency of sheep production.</td>
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<td>Schroeder, J.W. and M. Bauer. Metabolic relationships in supply of nutrients for lactating cows.</td>
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<td>Swanson, K. Factors influencing efficiency of nutrient use in ruminants. ND01746, 0228036</td>
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**New Grants Funded in 2012**

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<td>Berg, E.P. Comparison of red meat versus high carbohydrate diet as a means of preventing tissue-specific down-regulation of insulin receptors. North Dakota Beef Commission. $6,816. 1 year.</td>
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<td>Berg, E.P. Comparison of red meat versus high carbohydrate diet as a means of preventing tissue-specific down-regulation of insulin receptors. State Board of Agriculture Research and Education. $6,816. 1 year.</td>
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<td>Caton, J. Countering nutritional induced intrauterine growth restriction with VEGF gene therapy: Impacts on fetal developmental outcomes. USDA-AFRI. $150,000. 2 years.</td>
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<td>Dahlen, C.R. Beyond the Bunk/Beef College Meeting. North Dakota Corn Council. $1,000. 1 year.</td>
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<td>Dahlen, C.R. Evaluating the sustainability of beef cattle breeding systems. Sustainable Agriculture Research and Education Grant Program, USDA NIFA. $199,995. 3 years.</td>
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<td>Grazul-Bilska, Anna. Acquisition of molecular biology equipment. The NDSU Development Foundation. $4,800. 1 year.</td>
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<td>Grazul-Bilska, Anna</td>
<td>Role of nitric oxide (NO) system in ovarian function. USDA CSREES/NRI.</td>
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<td>Maddock Carlin, K. and R. Maddock</td>
<td>Influence of rate of temperature and pH decline on intramuscular beef tenderness variation in muscles in the round. ND SBARE.</td>
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<td>Maddock Carlin, K.R. and R.J. Maddock</td>
<td>Influence of rate of temperature and pH decline on intramuscular beef tenderness variation in muscles in the round. SBARE Animal Agriculture grant. Funded $7945.</td>
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<td>Mostrom, M.S., C.L. Stoltenow, and C.R. Dahlen</td>
<td>Livestock water quality: Pilot survey. State Board of Research and Education.</td>
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<td>Canola oil and offspring health: Synergistic effect with methyl nutrients. Northern Canola Growers Association.</td>
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<td>Maternal methyl diet and epigenetic imprint in offspring mammary carcinogenesis. NIH-NCI.</td>
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<td>Redden, R., D. Newman, and L. Warner</td>
<td>Expansion of lamb exposure at NDSU BBQ Boot Camp. North Dakota Lamb and Wool Producers Association and American Lamb Board.</td>
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<td>Reynolds, L.P.</td>
<td>Antigen retrieval/unmasking system. NDSU Development Foundation</td>
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<td>Prebiotic benefits of ProBiotein. Agricultural Products Utilization Commission.</td>
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<td>Stokka, G.L, L.L. Pederson, and C.R. Dahlen</td>
<td>Utilizing temperature data loggers to monitor temperature deviations in delivered and stored animal health vaccine shipments. National Cattlemen's Beef Association.</td>
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<td>Swanson, K., M. Bauer, and C. Dahlen</td>
<td>Influence of corn processing and distiller’s grains inclusion for finishing cattle on feeding behavior, gain efficiency, greenhouse gas emission, and carcass quality. North Dakota Corn Council.</td>
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<td>Swanson, K.C. and M. Bauer</td>
<td>Influence of limit-feeding and time of feeding on feed efficiency in steers fed backgrounding diets. North Dakota State Board of Agriculture and Education, Livestock Program.</td>
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<td>The effects of maternal nutrition during gestation on objective behavior measures of lamb vitality.</td>
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School of Food Systems

Active grants and contracts

Northern Pulse Growers Association: Improve US grown pulse quality through micronutrient enrichment: Three-year research program from the North Dakota State University Pulse Quality Program. $30,000 (D. Thavarajah)

Northern Pulse Growers Association: NDSU Pulse Quality Research Support, $50,000 (D. Thavarajah)

USA Dry Pea Lentil Council: NDSU Pulse Quality survey 2012, $17,680 (D. Thavarajah)

Northern Pulse Growers Association: Role of selenium and nitrogen fixation on increasing lentil (Lens culinaris L.) grain yield, $39,140 (D. Thavarajah)

Northern Pulse Growers Association: Improve US grown pulse quality through micronutrient enrichment: Three-year research program from the North Dakota State University Pulse Quality Program. $48,150 (D. Thavarajah)

Bill and Melinda Gates Foundation/HarvestPlus: Micronutrient Analysis of HarvestPlus Grain Samples. $25 (D. Thavarajah), 564

Northern Pulse Growers Association: NDSU Pulse Quality Research Support, $70,000 (D. Thavarajah)

Northern Pulse Growers Association NDSU Pulse Quality Research Support, $38,169 (D. Thavarajah)

USA Dry Pea Lentil Council: NDSU Pulse Quality survey 2011, $15,000 (D. Thavarajah)

North Dakota Corn Council/Growers July 1, 2012 to June 30, 2013, $58,640 (P. Thavarajah)

North Dakota Soybean Council/Growers of July 1, 2012 to June 30, 2013, $69,930 (P. Thavarajah)

Northarvest Beans, $27,000 (Hall)
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**Total (89 Projects) $4,256,667**
## Plant Sciences

### Berti

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<td>Fall harvest management of alfalfa cultivars with different fall dormancy</td>
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<td>Introgression of Fusarium head blight resistance from hexaploid wheat to durum</td>
<td>X. Cai, S. Zhong, E. Elias</td>
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<td>Enhancing resistance to Fusarium head blight</td>
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<td>Enriching and understanding the wheat genome by inducing homoeologous recombination (under preparation, due 02/19/13)</td>
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<td>Genomic and Genetic Identification of Signal Transduction Pathway Targets Regulating Well- Defined Phases of Leafy Spurge</td>
<td>M. E. Foley and M. J. Christoffers</td>
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<td>Genomic Approaches to Identify Insect Resistance Genes in Poplar Trees</td>
<td>PI: Steven Ralph, Co-PI: Wenhao Dai, Co-PI: M Kirst</td>
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<td>Development of ornamental plant species using biotechnology</td>
<td>PI: Wenhao Dai; PI: Wenhao Dai</td>
<td>Landscape Plant Development Center, MN</td>
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<td>Field evaluation of X-disease resistant chokecherry lines for small fruit production in North Dakota</td>
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<td>Development of grape varieties in North Dakota</td>
<td>PI: Wenhao Dai, Co-PI: Harlene</td>
<td>ND-SBARE</td>
<td>$ 20,592</td>
<td><strong>$ 10,296</strong></td>
</tr>
<tr>
<td>Metabolic profiling and sugar accumulation in fruits of a high-sugar pear mutant (Pyrus bretschneideri Rehd. cv. Dangshansuli)</td>
<td>P.I. C.B. Fang, (College of Hort., Anhui Agricultural University, China). Co-PI:</td>
<td>National Natural Science Foundation of China</td>
<td>$390,000</td>
<td>($ $ 62,000)</td>
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### Deckard

<table>
<thead>
<tr>
<th>Grant title</th>
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<tbody>
<tr>
<td>Adam Chyle assistantship</td>
<td>Bayer</td>
<td>$41,000</td>
<td><strong>$20,500</strong></td>
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### Elias

<table>
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<tr>
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<th>Participants</th>
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<th>2012 funds</th>
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<tbody>
<tr>
<td>Identify and develop durum wheat resistant to Fusarium head blight.</td>
<td>PI: Elias Elias; CoPI's: Frank Manthey Shaobin Zhong, and Shiaoman Chao</td>
<td>USDA-ARS</td>
<td>$ 129,812</td>
<td><strong>$129,812</strong></td>
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<tr>
<td>Expand durum wheat project.</td>
<td>Elias Elias</td>
<td>ND Wheat Commission</td>
<td>$ 95,000</td>
<td><strong>$95,000</strong></td>
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<tr>
<td>Develop durum germplasm with low Cadmium</td>
<td>Elias Elias</td>
<td>ND Wheat Commission</td>
<td>$ 43,500</td>
<td><strong>$43,500</strong></td>
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<tr>
<td>Purchase small plot combine.</td>
<td>Elias Elias</td>
<td>ND Wheat Commission</td>
<td>$ 80,000</td>
<td><strong>$80,000</strong></td>
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<tr>
<td>Identify molecular markers associated with low cadmium uptake in durum wheat.</td>
<td>Elias Elias</td>
<td>Crop Improvement Association</td>
<td>$ 18,000</td>
<td><strong>$18,000</strong></td>
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<tr>
<td>Enhance breeding durum wheat germplasm</td>
<td>PI: Elias M. Elias CoPI's: Frank Manthey, Shaobin Zhong, Shahryar Kianian, and Shiaoman Chao</td>
<td>NDSU-Agricultural Experiment Station</td>
<td>$ 17,000</td>
<td><strong>$ 8,500</strong></td>
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### Ghavami

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<tbody>
<tr>
<td>Association analysis of novel sources of FHB resistance derived from Tunisian tetraploid wheat and application of results from previous studies in development of more resistant cultivars.</td>
<td>S. Kianian (PI), E. Elias (Co-PI)</td>
<td>USDA-USWBSI</td>
<td>$100,000</td>
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### Gramig

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<tbody>
<tr>
<td>Integration of biological control and native cover crops for Canada thistle control</td>
<td>Burns, E., Gramig, G., Prischmann-Voldseth, D.</td>
<td>North Central Region Sustainable Agriculture Research and Extension Program, Graduate</td>
<td>$10,000</td>
<td>$10,000</td>
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<tr>
<td>Targeted grazing to reduce tillage in organic dryland systems: Environmental, ecological, and economic assessment</td>
<td>Menalled, F., P. Carr, P. Hatfield, P. Miller, Z. Miller, L. Burkle, M.</td>
<td>USDA-CSREES-NIFA Organic Agriculture Research and Extension Initiative</td>
<td>$1,499,815 (total) $78,196 (my share)</td>
<td>$499,938</td>
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<tr>
<td>Impact of weed management on soil arthropods in a soybean cropping system</td>
<td>Prischmann-Voldseth, D., Chatterjee, A., and Gramig, G.</td>
<td>ND Soybean Council</td>
<td>$17,086</td>
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### Hammond

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<tr>
<td>ALA increase</td>
<td></td>
<td>AmeriFlax</td>
<td>$10,000</td>
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### Hatterman-Valenti

<table>
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<tr>
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<th>2012 funds</th>
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<tbody>
<tr>
<td>Hastening the fruit ripening process for germplasm enhancement in cold-hardy grape crosses</td>
<td></td>
<td>ND Dept. Ag (Specialty Block Grant)</td>
<td>$19,197</td>
<td>$9,598.50</td>
</tr>
<tr>
<td>Assay to Determine Glyphosate Residues in Potatoes</td>
<td>Kasia Kinzer</td>
<td>Northern Plains Potato Growers Association</td>
<td>$3,000</td>
<td>$3,000</td>
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<tr>
<td>Assay to Determine Glyphosate Residues in Potatoes</td>
<td>Kasia Kinzer</td>
<td>MN Area II Potato Growers Association</td>
<td>$7,000</td>
<td>$7,000</td>
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<tr>
<td>Grape Breeding and Evaluation of Cold Hardy</td>
<td></td>
<td>ND Grape and Wine Program Committee</td>
<td>$5,000</td>
<td>$5,000</td>
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<tr>
<td>The Potential for Herbicide Carryover into Potatoes</td>
<td></td>
<td>Northern Plains Potato Growers Association</td>
<td>$5,480</td>
<td>$5,480</td>
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<tr>
<td>Utilizing pruning, thinning, leaf pulling to ripen grapes in ND</td>
<td>Jim Walla and Lorna Bradbury</td>
<td>SBARE – new and emerging crops</td>
<td>$19,197</td>
<td>$19,197</td>
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<tr>
<td>Selecting superior juneberry cultivars from North Dakota</td>
<td>F.M. Navarro, (12 co-PI's including H. Hatterman-Valenti)</td>
<td>NIFA</td>
<td>367,500/4%</td>
<td>$367,500</td>
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<tr>
<td>Development of Multipurpose Potato Cultivars with Enhanced Quality, Disease and Pest</td>
<td>Gary Secor, (5 co-PI's including H. Hatterman-Valenti)</td>
<td>SBARE-potatoes</td>
<td>7,023/25%</td>
<td>$7,023</td>
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<tr>
<td>Support and maintenance of an irrigated site for g处理DecimalNumberuation of barley breeding and genetics in North Dakota</td>
<td>Patricia McGlynn</td>
<td>Montana Dept. Ag.</td>
<td>44,464/18%</td>
<td>$22,232</td>
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### Helms

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<tr>
<th>Grant title</th>
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<tr>
<td>Variety Testing and Breeding Non-GMO Cultivars</td>
<td>NDSC</td>
<td>$260,000</td>
<td>$260,000</td>
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<tr>
<td>Visual Ratings for Iron-deficiency Chlorosis</td>
<td>NDSC</td>
<td>$57,500</td>
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<tr>
<td>Breeding of Glyphosate-resistant Cultivars</td>
<td>NDSC</td>
<td>$525,000</td>
<td>$175,000</td>
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### Horsley

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<tbody>
<tr>
<td>Six-rowed barley breeding and genetics</td>
<td>Sole-PI</td>
<td>American Malting Barley Association</td>
<td>$57,584</td>
<td>$57,584</td>
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<tr>
<td>Western Malting Barley Project</td>
<td>Sole-PI</td>
<td>NDAES</td>
<td>$49,500</td>
<td>$49,500</td>
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<tr>
<td>An integrated approach for developing FHB-resistant barley varieties</td>
<td>Sole-PI</td>
<td>USDA-ARS-US Wheat and Barley Scab Initiative</td>
<td>$191,938</td>
<td>$191,938</td>
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<tr>
<td>Plant disease initiative</td>
<td>P. Schwarz and R.</td>
<td>NDAES</td>
<td>$49,200</td>
<td>$24,600</td>
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<tr>
<td>Triticeae coordinated agricultural project</td>
<td>R. Brueggeman and R.</td>
<td>USDA-NIFA-AFRI</td>
<td>$56,000</td>
<td>$56,000</td>
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<tr>
<td>Development of two-rowed malting barley and</td>
<td>R. Brueggeman, P. Schwarz, and Q.</td>
<td>North Dakota Barley Council</td>
<td>$22,000</td>
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### Howatt

<table>
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<tr>
<td>Gift Support</td>
<td>various</td>
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<td>$187,750</td>
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## Iqbal

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<tbody>
<tr>
<td>Development of forage and cereal crops for agriculture on salinized soils.</td>
<td>Jan Dvorak, M. Luo</td>
<td>NSF/BREAD</td>
<td>$121,000</td>
<td>$40,333.33</td>
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<tr>
<td></td>
<td>and MJ Iqbal, M.</td>
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## Johnson

<table>
<thead>
<tr>
<th>Grant title</th>
<th>Participants</th>
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<tbody>
<tr>
<td>Screening Potential New Pulses and grain legumes for adaption in North Dakota</td>
<td>B. Johnson</td>
<td>SBARE New and Emerging Crops</td>
<td>$3,000</td>
<td>$3,000</td>
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<tr>
<td>Seeding date determination for selected new pulses in North Dakota</td>
<td>B. Johnson</td>
<td>SBARE New and Emerging Crops</td>
<td>$3,600</td>
<td>$3,600</td>
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<tr>
<td>Genotype screening and seeding date influence</td>
<td>B. Johnson</td>
<td>SBARE Canola</td>
<td>$5,160</td>
<td>$5,160</td>
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<tr>
<td>North Central Region Canola Research Program</td>
<td>B. Johnson, B. Schatz, E. Eriksmoen, A.</td>
<td>USDA-NIFA Sun Grant</td>
<td>$34,647</td>
<td>$34,647</td>
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<tr>
<td>Sustainable Feedstocks for an Oilseed Biofuel Industry in the Dakotas</td>
<td>B. Johnson, B. Schatz, E. Eriksmoen, A.</td>
<td>USDA-NIFA Sun Grant</td>
<td>$37,380</td>
<td>$37,380</td>
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<tr>
<td>Fall harvest management of alfalfa cultivars with different fall dormancy</td>
<td>M. Berti, B. Johnson, W. Seames, Y. Ji, R. Gesch, S. Orchard</td>
<td>USDA-NIFA Sun Grant</td>
<td>$112,551</td>
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## Kalb

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<tr>
<td>Junior Master Gardener Program</td>
<td>3,460 youth across state</td>
<td>NDSU Extension</td>
<td>$30,000</td>
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<td>Community orchard</td>
<td>Kalb, United Tribes Technical College</td>
<td>ND Dept. of Ag.</td>
<td>$2,500</td>
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### Kandel

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<tr>
<td>Soybean Productivity on Raised Seedbeds.</td>
<td>ND Soybean and Research Council</td>
<td>$ 9,390</td>
<td>$ 9,390</td>
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<td>Soybean Response to Nitrogen under Tile Drained Conditions</td>
<td>ND Soybean and Research council</td>
<td>$ 9,050</td>
<td>$ 9,050</td>
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<tr>
<td>Soybean Response to Inputs under Tile Drained</td>
<td>ND Soybean and Research council</td>
<td>$ 4,900</td>
<td>$ 4,900</td>
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<tr>
<td>Raised Bed Production as a Practice to Maximize Soybean Yields in Saturated Soil</td>
<td>MN Soybean Council</td>
<td>$ 38,000</td>
<td>$19,000</td>
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<tr>
<td>Improving N-use Efficiency in Spring Wheat, PI J. Ransom</td>
<td>MN Wheat and Research Council</td>
<td>$5,000</td>
<td>$2,500</td>
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<tr>
<td>Heat Units and Development Stage of Soybean, Co-PI A. Akyüz</td>
<td>ND Soybean Council</td>
<td>$7,000</td>
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<tr>
<td>Effect of Optimal Water Management for Sustainable and Stable Crop Production and Improvement of Water Quality in the Red River Valley, PI X. Jia</td>
<td>NCSARE</td>
<td>$193,677</td>
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<td>National Sunflower Survey 2012</td>
<td>National SunFlower Association</td>
<td>$3,500</td>
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<td>DuPont Pioneer Support for Research 201</td>
<td>DuPont Pioneer</td>
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### Kianian

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<tr>
<td>Expanded germplasm enhancement</td>
<td>Kianian SF</td>
<td>ND Wheat Commission</td>
<td>$ 50,000</td>
<td>$ 50,000</td>
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<tr>
<td>Analysis of nuclear-mitochondrial communication defects: A critical step to increase wheat and rice productivity</td>
<td>Kianian SF, Mergoum M, Ogbonnaya F, Baum M.</td>
<td>Monsanto Beachell-Borlaug ISP</td>
<td>$ 148,832</td>
<td>$37,208</td>
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<tr>
<td>Radiation hybrid mapping: an efficient system</td>
<td>Kianian SF, Mergoum M, Ogbonnaya M</td>
<td>Monsanto Beachell-Borlaug ISP</td>
<td>$ 151,323</td>
<td>$37,830.75</td>
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<tr>
<td>TRPGR-Construction of high-resolution physical maps for large plant genomes</td>
<td>Kianian SF, Riera-Lizarazu O, Gu YQ, Luo</td>
<td>NSF-PGRP</td>
<td>$777,062.50</td>
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<tr>
<td>GERP: A high resolution map of recombination</td>
<td>Pawlowski WP, Chen C, Kianian SF,</td>
<td>NSF-PGRP</td>
<td>810,293 (total 4,087,080)</td>
<td>$202,573.25</td>
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### Lee

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<tr>
<td>Ensuring accessibility and suitability of open-pollinated vegetable varieties</td>
<td>Co-PI with Frank Kutka</td>
<td>USDA-Specialty Crop Block Grant</td>
<td>$ 39,302</td>
<td>$39,302</td>
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<tr>
<td>Lym</td>
<td>Participants</td>
<td>Funding agency</td>
<td>Funds</td>
<td>2012 funds</td>
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<tr>
<td>Evaluation of quinclorac and aminocyclopyrachlor movement in the soils of the Sheyenne National Grassland</td>
<td>R. G. Lym</td>
<td>USDA-Forest Service</td>
<td>$ 55,000</td>
<td>$18,333</td>
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<thead>
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<th>Manthey</th>
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<tr>
<td>Whole Wheat Durum Mill</td>
<td>Frank Manthey</td>
<td>NDWC</td>
<td>$ 15,500</td>
<td>$15,500</td>
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<tr>
<td>Durum Quality Research Support</td>
<td>Frank Manthey</td>
<td>NDWC</td>
<td>$ 25,000</td>
<td>$25,000</td>
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<tr>
<td>Durum Wheat Color</td>
<td>Frank Manthey</td>
<td>NDWC</td>
<td>$ 25,000</td>
<td>$25,000</td>
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<tr>
<td>Developing Color Map for Pasta Scores. Minolta Colorimeter CR410 and Hunter ColorFlex</td>
<td>Frank Manthey</td>
<td>NDWC</td>
<td>$ 6,680</td>
<td>$ 6,680</td>
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<tr>
<td>Royalties and Fee Testing</td>
<td>Frank Manthey</td>
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<td>$ 26,057</td>
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<tr>
<th>Marais</th>
<th>Participants</th>
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<tbody>
<tr>
<td>Development of hard red winter wheat breeding material</td>
<td>GF Marais</td>
<td>ND Wheat Commission</td>
<td>$ 58,000</td>
<td>$58,000</td>
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<tr>
<td>Transfer of FHB resistance to NDSU hard red winter wheat breeding material</td>
<td>GF Marais</td>
<td>USWBSI HWW-CP</td>
<td>$ 21,442</td>
<td>$21,442</td>
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<tr>
<td>Use of recurrent mass selection to pre-breeding hard red winter wheat for resistance to major biotrophic and necrotrophic diseases</td>
<td>GF Marais</td>
<td>Minnesota Wheat Research and Promotion Council</td>
<td>$ 72,000</td>
<td>$36,000</td>
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<tr>
<td>Hard red winter wheat breeding program – development of FHB resistant germplasm</td>
<td>GF Marais</td>
<td>AES FHB Funding, NDSU</td>
<td>$ 50,000</td>
<td>$50,000</td>
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<td>Transfer of leaf and stem rust resistance genes to hard red winter wheat genetic backgrounds</td>
<td>GF Marais</td>
<td>Minnesota Wheat Research and Promotion Council</td>
<td>$ 60,915</td>
<td>$30,457.50</td>
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<tr>
<td>Development of hard red winter wheat breeding material</td>
<td>NDSU-Plant Sciences</td>
<td>Bucks Unlimited/ Bayer</td>
<td>$800,000</td>
<td>$200,000</td>
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### McClean

<table>
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<th>Participants</th>
<th>Funding Agency</th>
<th>Funds</th>
<th>2012 funds</th>
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</thead>
<tbody>
<tr>
<td>Iron Deficiency Chlorosis: Getting to the Heart of the Problem Root</td>
<td>McClean (NDSU), Vance Stupar (University of Minnesota) (USDA/St. Paul)</td>
<td>North Central Soybean Research Program</td>
<td>$104,000</td>
<td>$26,000</td>
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<tr>
<td>Center of Excellence: Oilseed Development I and II</td>
<td>McClean, Rahman, Wilson (NDSU)</td>
<td>ND Department of Commerce</td>
<td>$3,500,000</td>
<td>$190,833</td>
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<tr>
<td>Common Bean Coordinated Agricultural Project</td>
<td>McClean, Osorno, Garden-Robinson,</td>
<td>USDA/AFRI/Plant</td>
<td>$4,000,000</td>
<td>$300,000</td>
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<tr>
<td>White mold resistance-QTL: identification, interactions, and fine mapping in common bean</td>
<td>McClean (NDSU), Miklas (USDA/Prosser), Myers (Oregon State</td>
<td>USDA Sclerotinia Initiative.</td>
<td>$48,000 ($320,000; total, $146,000)</td>
<td>$73,000</td>
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<tr>
<td>Broadening the Accessibility and Portability of Biology Animations</td>
<td>McClean, Johnson, Reindl (NDSU).</td>
<td>NSF/CCLI.</td>
<td>$494,000</td>
<td>$70,571</td>
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### McMullen

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<tbody>
<tr>
<td>Oat SNP Development and Identification of Loci Affecting Key Traits in North American Oat Germplasm Using Association Genetics; Agronomic and Quality Testing.</td>
<td>Eric Jackson, leader and many other participants</td>
<td>USDA-ARS-AFRI,</td>
<td>$17,000</td>
<td>$5,666</td>
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<tr>
<td>Oat Improvement in North Dakota</td>
<td>Michael McMullen,</td>
<td>Pepsico/Quaker</td>
<td>$83,000</td>
<td>$83,000</td>
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<tr>
<td>Development of Oat Varieties with Improved</td>
<td>Michael McMullen,</td>
<td>Pepsico/Quaker Oats.</td>
<td>$95,000</td>
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### McPhee

<table>
<thead>
<tr>
<th>Grant title</th>
<th>Participants</th>
<th>Funding agency</th>
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<th>2012 funds</th>
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<tbody>
<tr>
<td>Western regional cool season legume evaluation trials</td>
<td>G. Vandemark, R. McGee, C. Chen, K. McPhee</td>
<td>USA Dry Pea and Lentil Council</td>
<td>$40,120</td>
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<tr>
<td>Developing natural herbicide tolerance and resistance in lentil</td>
<td>Kevin McPhee</td>
<td>State Board of Agricultural Research and</td>
<td>$5,149</td>
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<td>Pulse Crop Breeding</td>
<td>Kevin McPhee</td>
<td>NPGA</td>
<td>$73,060</td>
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<tr>
<td>Pulse Breeding</td>
<td>Kevin McPhee</td>
<td>NPGA</td>
<td>$30,000</td>
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<tr>
<td>Evaluation of hail injury on lentil and chickpea</td>
<td>Kevin McPhee</td>
<td>National Crop Insurance Services</td>
<td>$14,000</td>
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<tr>
<td>Compositional analysis of pea and lentil variety trials in MT and ND</td>
<td>K. McPhee, C. Chen, D. Thavarajah</td>
<td>USA Dry Pea and Lentil Council</td>
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### Mergoum

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<tr>
<td>Positioning NDSU Spring Wheat Breeding Program to Better Serve MN Wheat Growers</td>
<td>Minnesota Wheat Research and Promotion Council (MNWRPC)</td>
<td>$100,000</td>
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<tr>
<td>Evaluation of White and Specialty Spring Wheat Germplasm to Scab Disease</td>
<td>USDA-ARS</td>
<td>$17,500</td>
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<tr>
<td>Expanding FHB testing facilities</td>
<td>ND State Funds</td>
<td>$67,400</td>
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<td>Genetic Characterization of Fusarium Head Blight Resistance in two Elite Spring Wheat Cultivars.</td>
<td>USDA-ARS</td>
<td>$39,859</td>
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<td>Development of Adapted Hard Red Spring Wheat Cultivars and Germplasm Resistant to Scab Disease.</td>
<td>USDA-ARS</td>
<td>$108,613</td>
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<tr>
<td>Providing the wheat growers with adapted spring wheat cultivars using efficient and rapid modern methods</td>
<td>ND-SBARE</td>
<td>$20,000</td>
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<tr>
<td>Providing the wheat growers with adapted spring wheat cultivars using efficient and rapid modern methods</td>
<td>ND Wheat Comm.</td>
<td>$12,000</td>
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<tr>
<td>Development of hard red spring wheat cultivars resistant to saw fly insect.</td>
<td>ND-SBARE</td>
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<tr>
<td>Development of hard red spring wheat cultivars resistant to saw fly insect.</td>
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<td>Technician Specialty Wheat Breeder</td>
<td>ND-WC</td>
<td>$60,750</td>
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<td>HRSW breeding program</td>
<td>ND Wheat Comm.</td>
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<td>Modernizing HRSW breeding equipment</td>
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<tr>
<td>Breeding for White and Specialty wheat</td>
<td>ND Wheat Comm.</td>
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<td>Breeding wheat for Clearfield resistance</td>
<td>BASF</td>
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### Osorno

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<td>Bean Coordinated Agricultural Project (BeanCAP)</td>
<td>USDA-AFRI</td>
<td>$4,000,000</td>
<td>$1,333,333</td>
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<td>Development of an Ecophysiology Gene-Based Model</td>
<td>National Science Foundation</td>
<td>$2,400,000</td>
<td>$800,000</td>
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<tr>
<td>Inheritance Studies of New Potential Sources of Resistance to White Mold in Dry Bean</td>
<td>USDA-ARS Nat. Sclerotinia Initiative</td>
<td>$13,000</td>
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<tr>
<td>Potential for Mineral Biofortification of Grown Dry Bean</td>
<td>State Board of Agricultural Research and Education (SBARE)</td>
<td>$13,291</td>
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<tr>
<td>Dry Bean Breeding for the Northern Plains</td>
<td>Northharvest Bean Growers Assoc.</td>
<td>$140,850</td>
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<td>Screening of the USDA Core Collection of Common Bean for Resistance to Halo Blight</td>
<td>USDA-ARS Crop Germplasm Committee (CGC)</td>
<td>$17,232</td>
<td>$8,616</td>
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<tr>
<td>Slow Darkening Pinto Beans: Development, Agronomic Performance, and Quality Testing</td>
<td>ND Dept. of Agric.- Specialty Crop Research Block Grant Program</td>
<td>$55,612</td>
<td>$27,806</td>
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<td>Genetics of Resistance in Dry Bean to Soybean Cyst Nematode</td>
<td>Northharvest Bean Growers Assoc.</td>
<td>$44,415</td>
<td>$14,805</td>
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<td>Dry Bean Variety Trials</td>
<td>Fee testing</td>
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### Rahman

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<tr>
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<th>Participants</th>
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<tbody>
<tr>
<td>Development of high oil per acre conventional canola cultivar by utilizing modern Double</td>
<td>PI: Dr. M Rahman, Co-PI: Dr. Phil McLean</td>
<td>Northern Canola Growers Association</td>
<td>$151,400</td>
<td><strong>$50,466</strong></td>
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<tr>
<td>Development new canola germplasm for increased oil per acre adapted in the North</td>
<td>PI: Dr. M Rahman, Co-PI: Dr. Phil McLean</td>
<td>National Institution of Food &amp; Agriculture</td>
<td>$40,538</td>
<td><strong>$40,538</strong></td>
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<tr>
<td>Development of High Seed Yield Spring Canola Utilizing winter canola</td>
<td>PI: Dr. M Rahman, Co-PI: Dr. Phil McLean</td>
<td>Northern Canola Growers’ Association</td>
<td>$8,084</td>
<td><strong>$4,042</strong></td>
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<tr>
<td>USDA-FAS Borlaug Fellow on Rapseseed</td>
<td>PI: Dr. M Rahman, Co-PI: Dr. M. Foley</td>
<td>USDA- Foreign Agricultural Service</td>
<td>$17,710</td>
<td><strong>$17,710</strong></td>
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<tr>
<td>Improvement of Salinity Tolerance in Canola</td>
<td>PI: Dr. Qi Zhang, Co-PI: Dr. M Rahman</td>
<td>Northern Canola Growers’ Association</td>
<td>$11,800</td>
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### Ransom

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<tbody>
<tr>
<td>Improving N Use Efficiency in Spring Wheat</td>
<td>J. Ransom and collaborators in MN</td>
<td>MN Wheat Res. &amp; Promotion Council</td>
<td>$27,620</td>
<td><strong>$13,810</strong></td>
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<tr>
<td>Title Drainage and Fertilizer Additives on Corn</td>
<td>J. Ransom &amp; A. Chatterjee</td>
<td>ND Corn Council</td>
<td>$48,600</td>
<td><strong>$24,300</strong></td>
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<tr>
<td>Increasing Corn Yields with Intensive Management</td>
<td>B. Schatz &amp; J. Ransom</td>
<td>ND Corn Council</td>
<td>$19,700</td>
<td><strong>$9,850</strong></td>
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<tr>
<td>How Much Corn Stover Can be</td>
<td>J. Ransom, B. Schatz, W.</td>
<td>ND Corn Council</td>
<td>$32,400</td>
<td><strong>$16,200</strong></td>
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<tr>
<td>Company trials</td>
<td>J. Ransom</td>
<td>Various</td>
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### Robinson

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<thead>
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<tbody>
<tr>
<td>Potato Growers Association</td>
<td>Andy Robinson</td>
<td>MN Area II Potato Growers</td>
<td>$14,584</td>
<td><strong>$14,584</strong></td>
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<tr>
<td>Northern Plains Potato Growers AssociationPotato Specialist</td>
<td>Andy Robinson</td>
<td>Northern Plains Potato Growers Association</td>
<td>$14,584</td>
<td><strong>$14,584</strong></td>
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<tr>
<td>Development of multipurpose potato cultivars with enhanced quality, disease</td>
<td>Andy Robinson</td>
<td>University of Wisconsin / USDA / NIFA</td>
<td>$2,750</td>
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### Schwarz

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<tr>
<th>Grant title</th>
<th>Participants</th>
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<tbody>
<tr>
<td>Support of the Institute of Barley and Malt Sciences</td>
<td>P. Schwarz</td>
<td>American Malting Barley Association</td>
<td>$44,000</td>
<td><strong>$44,000</strong></td>
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<tr>
<td>Measurement of Hormones and Other Metabolites Associated with Dormancy and Pre- Harvest Sprouting in Barley</td>
<td>P. Schwarz</td>
<td>American Malting Barley Association</td>
<td>$9,760</td>
<td><strong>$9,760</strong></td>
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<tr>
<td>Malting barley deoxynivalenol diagnostic services.</td>
<td>P. Schwarz and S. Qian</td>
<td>US Wheat and Barley</td>
<td>$266,178</td>
<td><strong>$133,089</strong></td>
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<tr>
<td>Education and promotion of barley through the Institute of Barley and Malt Sciences</td>
<td>P. Schwarz</td>
<td>North Dakota Barley Council</td>
<td>$10,500</td>
<td><strong>$10,500</strong></td>
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<tr>
<td>Measurement of hormones and other metabolites in barley</td>
<td>P. Schwarz</td>
<td>North Dakota Barley Council</td>
<td>$20,000</td>
<td><strong>$20,000</strong></td>
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<tr>
<td>Support of the Institute of Barley and Malt Sciences</td>
<td>P. Schwarz</td>
<td>Montana Wheat and Barley Committee</td>
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<tr>
<td>Montana Barley Quality Survey and Report</td>
<td>P. Schwarz</td>
<td>Montana Wheat and Barley Committee</td>
<td>$10,745</td>
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### Simsek

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<tbody>
<tr>
<td>2012 Hard Red Spring Wheat Regional Quality Survey</td>
<td>Senay Simsek</td>
<td>South Dakota Wheat Commission</td>
<td>$8,500</td>
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<tr>
<td>Acquisition of MALLS</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$73,000</td>
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<tr>
<td>HRS &amp; Durum Crop Quality Survey</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$50,000</td>
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<td>Acquisition of FOSS-NIR</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$55,000</td>
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<td>Wheat Quality Part-Time Technician</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$12,500</td>
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<tr>
<td>2012 Hard Red Spring Wheat Regional Quality</td>
<td>Senay Simsek</td>
<td>MT Wheat &amp; Barley Committee</td>
<td>$16,500</td>
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<tr>
<td>Specialty Wheat Quality Research Support</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$50,000</td>
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<td>2012 Hard Red Spring and Durum Wheat Regional Crop Quality Survey</td>
<td>Senay Simsek</td>
<td>US Wheat Associates</td>
<td>$45,000</td>
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<td>HRW Quality Research Support</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
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<td>Specialty Wheat Quality Research-Technician</td>
<td>Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
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<td>Technical and Information Services</td>
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<td>North Dakota Wheat Commission</td>
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<td>Specialty Research Project</td>
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<td>North Dakota Wheat Commission</td>
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<td>2012 Hard Red Spring Wheat Regional Quality Survey</td>
<td>Senay Simsek</td>
<td>MN Wheat Research and Promotion Council</td>
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<td>Analysis of Bound DON in Hard Red Spring Wheat</td>
<td>Senay Simsek</td>
<td>MN Wheat Research and Promotion Council</td>
<td>$15,000</td>
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<tr>
<td>NDSU FORWARD- Travel Grant</td>
<td>Senay Simsek</td>
<td>NSF through FORWARD-NDSU</td>
<td>$1,500</td>
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<tr>
<td>Prebiotic Benefits of ProBiotein</td>
<td>Senay Simsek</td>
<td>Foods First, LLC</td>
<td>$45,000</td>
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<tr>
<td>The Effects of Genotype and Environment on the Structure and Functionality of Arabinoxylans in Hard White and Hard Red Spring Wheat</td>
<td>Senay Simsek</td>
<td>SBARE-Wheat</td>
<td>$10,000</td>
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<tr>
<td>Intrinsic Characteristics of Modified DDGS and Development of Effective Handling Strategies</td>
<td>-(PI) R.P.Kingsley Ambrose,Mark Casada, Senay Simsek</td>
<td>NC213 Anderson Research Grant program</td>
<td>$31,612 of $150,000</td>
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<tr>
<td>Multiplexed Electrochemical Biosensor for</td>
<td>-(PI) Sundaram Gunasekaran, Senay Simsek</td>
<td>NC213 Anderson Research Grant</td>
<td>$22,450 of $150,000</td>
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<tr>
<td>Evaluation of White and Specialty Spring Wheat Germplasm to Scab Disease</td>
<td>-(PI) Mohamed Mergoum, Senay Simsek</td>
<td>USDA-ARS</td>
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<tr>
<td>Discovery of Specific Starch Properties of NDSU Potato Germplasm for Nutritional and</td>
<td>(PI) Susie Thompson, Senay Simsek</td>
<td>North Dakota Specialty Crop Block Grant</td>
<td>$0 of $27,000</td>
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<tr>
<td>Development of Adapted Hard Red Spring Wheat Cultivars and Germplasm</td>
<td>(PI) Mohamed Mergoum, Senay Simsek</td>
<td>USDA-ARS</td>
<td>$0 of $108,613</td>
<td>$108,613</td>
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<tr>
<td>Does Post-anthesis Applied N and Pre-harvest</td>
<td>(PI ) Joel Ransom, Senay Simsek</td>
<td>North Dakota Wheat Commission</td>
<td>$9,600 of $24,600</td>
<td>$24,600</td>
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<tr>
<td>Measurement of Hormones and Other Metabolites Associated with Dormancy and Pre-Harvest Sprouting in Barley</td>
<td>(PI) Paul Schwarz, Richard Horsley, Senay Simsek</td>
<td>American Malting Barley Association, Inc</td>
<td>$0 of 9700</td>
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<tr>
<td>Reduction of Mycotoxin Levels in Distillers</td>
<td>(PI): Klein Illeleji, Richard Stroshine, Senay Simsek</td>
<td>NC213 Anderson Team Grant</td>
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**Stachler**

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<tr>
<td>Weed Control in Sugarbeet</td>
<td>Jeff Stachler</td>
<td>Sugarbeet Research and Education Board of MN and</td>
<td>$ 76,324</td>
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<tr>
<td>Management of Glyphosate-Resistant Weeds in</td>
<td>Jeff Stachler</td>
<td>ND Soybean Council</td>
<td>$ 23,479</td>
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<td>Volunteer Canola Control in Sugarbeets</td>
<td>Brian Jenks, Jeff Stachler</td>
<td>Northern Canola Growers Association</td>
<td>$12,500 (my share $7,500)</td>
<td>$7,500</td>
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<td>Unrestricted Gifts</td>
<td>Jeff Stachler</td>
<td>Monsanto, FMC, Syngenta, Bayer CropScience, DuPont, BASF, Helm Agro, Winfield Solutions, Helena Chemical, Emerald, BioAgriculture Co</td>
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**Thompson**

<table>
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<tr>
<td>Potato breeding and cultivar development for</td>
<td>A. Thompson</td>
<td>NPPGA</td>
<td>$ 60,000</td>
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<tr>
<td>Potato breeding and cultivar development for the Northern Plains</td>
<td>A. Thompson</td>
<td>MN Area II Potato Research and Promotion Council</td>
<td>$ 20,000</td>
<td>$20,000</td>
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<tr>
<td>Development of Multipurpose Potato Cultivars with Enhanced Quality, Disease and Pest</td>
<td>F.M. Navarro, D. Douches, C. Thill, A. Thompson</td>
<td>NIFA – Special Potato (ND $90,625)</td>
<td>$367,500</td>
<td>$90,625</td>
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<tr>
<td>Discovery of Specific Starch Properties of NDSU Potato Germplasm for Nutritional and</td>
<td>A Thompson, S. Raatz, S. Simsek, and P. Thavarajah</td>
<td>ND Specialty Crops Crop Block Grant</td>
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### West

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<tr>
<td>New Genetic Tool for Woody Ornamental Plant Breeding and Improvement.</td>
<td>PI: Todd West</td>
<td>J.Frank Schmidt Family Charitable Foundation</td>
<td>$ 10,851</td>
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### Zhang

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<tr>
<td>Selection of salt- and flooding-tolerant canola</td>
<td>Qi Zhang (PI) and Mukhlesur Rahman (Co-)</td>
<td>Northern Canola Grower Association</td>
<td>$11,800</td>
<td>$11,800</td>
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<tr>
<td>Effect of Glycinebetaine priming on the tolerance of abiotic stresses in turfgrass</td>
<td>Qi Zhang (PI)</td>
<td>United States Golf Association</td>
<td>$ 9,693</td>
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### Zollinger

<table>
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<tr>
<th>Grant title</th>
<th>Participants</th>
<th>Funding agency</th>
<th>Funds</th>
<th>2012 funds</th>
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<tbody>
<tr>
<td>Weed control in field crops &amp; adjuvant res.</td>
<td>Industry</td>
<td>Various chemical and adjuvant companies</td>
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<td>Weed control in field crops &amp; adjuvant res.</td>
<td>Commodity groups</td>
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<td>Northharvest DEB</td>
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<td>$10,000</td>
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<td>ND Soybean Gr.</td>
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<td>ND DOA</td>
<td>$ 25,000</td>
<td>$25,000</td>
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<td>Pyroxasulfone in sunflower and dry edible beans.</td>
<td>NDSU Extension Weed science</td>
<td>ND DOA</td>
<td>$ 25,000</td>
<td>$25,000</td>
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<td><strong>$12,079,206</strong></td>
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</table>
Acevedo, M. Fine mapping and Cloning of new stem rust resistance. ND Wheat Commission $34,873-$34,873

Acevedo, M. Incorporation and Characterization of Barley Loci Associated with Wheat Stem Rust Resistance Enhancement. $4,880-$4,880

Acevedo, M. Leaf and stem rust resistance research. ND Wheat Commission. $25,000-$25,000

Acevedo, M. Characterization of leaf rust resistance. ND Wheat Commission. $19,552-$19,552

Brueggeman R.B. and Friesen T., North Dakota Barley Council $30,000

Brueggeman R.B. and Friesen T., North Dakota Barley Council $31,995

Brueggeman R.B. AMBA. $24,000

Brueggeman R.B. MillerCoors. $80,408

Brueggeman R.B. SBARE. $12,384

Brueggeman R.B. USDA-ARS USWBSI. $21,408

Brueggeman R.B. USDA-RAMP. $49,928

del Río L.E. and Goswami, R. Identification of resistance and pathogenicity genes associated with Sclerotinia sclerotiorum infection using next-generation sequencing. USDA-ARS Sclerotinia Initiative. $56,530-$56,530


del Río L.E. and Knodel, J. Managing blackleg: are canola flea beetles blackleg vectors?-$38,168-$0


del Rio, L.E. 80 Ultra Freezer. Northern Canola Growers Association. $ 4,500-$ 4,500

Dill-Macky, R., Zhong, S., and Gautam, P.- Root Rot Diseases in the Upper Midwest: a coordinated approach to combatting this complex of diseases-Minnesota Wheat Research and Promotion Council, MN. $36,000-$12,000

Dubcovsky J., et al. Triticeae –CAP. USDA-NIFA, $5,000,000 total, $444,000 (Brueggeman) and $102,013 (Zhong).

Elias, E., Zhong, S., Manthey, F., Kianian, S., and Cai, X. Enhancing durum wheat research at North Dakota State University. North Dakota State Special Appropriation for Wheat Scab Research. $80,000-$16,000


Gudmestad, N.C- Effect of application method, soil temperature and rate of metam sodium on the control of Verticillium wilt- MN Area II Potato Growers- $30,000


Gudmestad, N.C. Development of an integrated research and management program for zebra chip of potato- USDA-NIFA-SCRI- $122,623

Gudmestad, N.C. Effect of application method, soil temperature and rate of metam sodium on the control of Verticillium wilt- Northern Plains Potato Growers Association- $30,000

Gudmestad, N.C. Genome sequencing and comparative genomics of zebra chip disease bacteria-USDA-ARS-$43,747

Gudmestad, N.C. Gifts and grants from various agricultural companies- $205,125


Gudmestad, N.C. Potential management of powdery scab and mop top virus using an integration of soil fumigation and genetic resistance- MN Area II- $10,000

Gudmestad, N.C. Screening of potato germplasm for genetic resistance to the potato mop top virus-USDA-ARS- $15,000

Halley, S., and Markell, S. Evaluation of fungicides for management of blackleg disease in canola. North Dakota Department of Agriculture Harmonization Board. $7,000-$7,000

Halley, S., and Markell, S. Evaluation of Fungicides for Management of Blackleg Disease in Canola. Northern Canola Growers Association. $14,000-0
Haynes et al. National Late Blight Trials. USDA-ARS. $6000 (Secor share)

Horvath, D. and del Rio, L.E. Plant signal regulating sclerotia germination and development - USDA-ARS Sclerotinia Initiative $92,640-$ 0

Khan, M. Evaluating and developing new fungicides for controlling Rhizoctonia root rot of sugarbeet. North Dakota State Board of Agriculture Research and Education. $5,000.

Khan, M. Evaluating fungicides for controlling diseases of sugarbeet. Gift funds from chemical companies. $216,310. ($389,962)

Khan, M. Improving disease management and agronomic practices of sugarbeet. Sugarbeet Research and Education Board of Minnesota and North Dakota. $57,812.

Khan, M. Sugarbeet extension programs and program maintenance. Sugarbeet Research and Education Board of Minnesota and North Dakota. $90,000.

Khan, M. Understanding the mechanism by which azoxystrobin provides control against R. solani. Sugarbeet Research and Education Board of Minnesota and North Dakota. $20,840.

Kinzer, K., Knodel, J.J., and McMullen, M. Great Plains Diagnostic Network, National Plant Diagnostic Center Laboratories for Plant Disease and Pest Diagnosis & Surveillance, USDA / Kansas State University-$46,000-($6,000)*

Knodel, J.J. Fall Soil Survey for Wheat Midge in North Dakota, ND Wheat Commission 2012 Research Grants. $7,000

Knodel, J.J. Grower survey of pest problems: pesticide use and varieties in 2012, Northarvest Bean Growers Association. $2,200

Knodel, J.J. and Beauzay, P.B Winfield Solutions, soybean insecticide trials-$7,200

Knodel, J.J. and Beauzay, P.B. Bayer CropScience, wheat insecticide trials-$2,650

Knodel, J.J. and Beauzay, P.B. E.I. DuPont, sunflower, canola and soybean insecticide trials$36,000

Knodel, J.J. and Beauzay, P.B. Field Demonstration of Different Insecticide Strategies for Management of Soybean Aphids, North Dakota Soybean Council. $16,900

Knodel, J.J. and Beauzay, P.B. FMC Corporation, soybean insecticide trials-$4,800

Knodel, J.J. and Beauzay, P.B. Gowan Company, soybean insecticide trial-$2,400

Knodel, J.J. and Beauzay, P.B. Loveland Products, soybean insecticide trials-$14,000

Knodel, J.J. and Beauzay, P.B. Optimizing Control of Wheat Stem Sawfly in North Dakota, ND Wheat Commission. $6,480

Knodel, J.J. and Beauzay, P.B. Syngenta Crop Protection, canola, sunflower and potato insecticide trials. $12,100
Knodel, J.J. and Waldstein, D.E. Proactive Insecticide Resistance Monitoring and Management for Crucifer Flea Beetle, Northern Canola Growers Association. $18,772

LeBoldus, J.M. and Stanosz G.R. USDA-NIFA, $98,190

LeBoldus, J.M. North Dakota Forest Service $33,000

LeBoldus, J.M. North Dakota Forest Service, $12,000

Liu Z. Disease evaluation of wheat breeding lines. Bayer Crop Science. $1,000-$1,000

Liu, Z. and Mergoum, M. Characterization of the current race structure of Pyrenophora triticirepentis, the causal agent of wheat tan spot in North Dakota-ND State Board of Agricultural Research & Education. $15,000-$15,000


Markell, S. North Dakota sub-award for the Great Plains Diagnostic Network - NIFA-USDA. $25,800-$25,800-Collab.

Markell, S. and Qi, L. Introduction of rust resistance genes into confection sunflower. National Sunflower Association. $54,000-$54,000


McMullen, M. and LeBoldus, J.M. USDA-NIFA, $4,950

McMullen, M., Ransom, J., Kalb, K. Kinzer, T., Knodel, J., and Thostenson, A. ND’s IPM Coordination, IPM Collaboration, IPM in Agronomic Crops, IPM to support Diagnostic Lab, and Urban IPM, USDA NIFA - ND EIPM Coordination Grant. $108,000-($17,556) (funding each year)*

Mergoum, M, Cai, X, Kianian, S, and Zhong, S. Enhancing the FHB resistance screening capacity and efficiency in spring wheat-North Dakota State Special Appropriation for Wheat Scab Research. $125,000-$20,000


$61,502 total. My portion of the grant is $47,502.


Nelson, B. USDA-ARS Sclerotinia Initiative. Genetic variation and virulence of Sclerotinia sclerotiorum in the United States. $206,753

Pasche, J.S. The Evaluation of Resistance to Common Bacterial Blight in Dry Edible Bean. North Dakota Dry Edible Bean Seed Growers Association. $9,270-$9,270


Pasche, J.S. and Markell, S.G. Dry Edible Bean Disease Research. SBARE. $6,680-$6,680

Pasche, J.S. and Markell, S.G. Dry Edible Bean Disease Research. Northarvest Dry Bean Growers. $63,700-$63,700

Pasche, J.S. Borlaug Fellowship Program for Algeria. USDA/ Foreign Agriculture Services. $27,532-$27,532

Pasche, J.S. Development of a Quantitative PCR Assay to Detect Colletotrichum lindemuthianum in Dry Edible Beans. National Science Foundation EPSCoR. $55,370-$55,370


Rasmussen, JB. Acquisition of Growth Chambers for Use in Plant Pathology, Genetics and Physiology. North Dakota Wheat Commission. $250,000.

Rasmussen, JB. Acquisition of Goods and Services. USDA Special Cooperative Agreement. $2,700.

Rasmussen, JB. Acquisition of Goods and Services. USDA Special Cooperative Agreement. $16,000.

Rasmussen, JB. and T. Gulya. Discovery and Use of Novel Sources of Resistance to Head Rot and Stalk Rot in Cultivated Sunflower and Wild Helianthus. USDA Sclerotinia Initiative $58,527.

Rasmussen, JB. Identification and Utilization of UG99 Resistance Genes from Wild Relatives of Wheat. USDA ARS. $37,000.

Rasmussen, JB. Management of Pathogens Affecting Pulse Crops in North Dakota. Northern Pulse Growers Association. $25,000.

Rasmussen, JB. Support for disease forecasting system. BayerCrop Science. $10,000.

Rasmussen. Pathogen-barley Interactions. USDA ARS Specific Cooperative Agreement. $36,440.

Rasmussen. Identification of factors affecting virulence of sugarbeet pathogens. Beet Sugar Development Foundation. $8,000.

Rasmussen, J.B. Specific contract agreement. USDA/ARS. $14,545.

Secor, G, V. Rivera and M. Khan. 2011. Sensitivity of Cercospora beticola to foliar fungicides in sugarbeet fields of Minnesota and North Dakota. Sugar Beet Research and Education Board of MN and ND. $26,500


Thompson, A. and Gudmestad N.C.- Development of multipurpose potato cultivars with enhanced quality, disease and pest resistance- USDA-NIFA- $32,400

Thompson, A. et al. 2012. Development of Multipurpose Potato Cultivars with Enhanced Quality, Disease and Pest Resistance. CSREES. $17,008 (Secor share)

Tillmon, K. Over 29 investigators in 14 states-Soybean Aphid Management, Resistance, and Outreach in the North Central Region-$712,975-($15,000)*

Wunsch, M., Halley, S., Albus, W., Harveson, R., Bergman, J., Schatz, B., and Markell, S. Facilitating management of sclerotinia head rot of sunflowers the screening hybrids for resistance and evaluating fungicides as efficacy. United States Department of Agriculture - National Sclerotinia Initiative. $64,211-$0

Zhong, S. and Elias, E. Identify FHB resistance in Timopheevii wheats and introgress it into durum wheat-USDA-CSREES, Scab initiative. $11,474

Zhong, S. and Xu, S. S-Genetic characterization and utilization of disease resistance genes in tetraploid wheat-USDA-ARS, Special Cooperation Agreement. $34,000

Zhong, S. Survey root rot diseases in North Dakota and identify resistance sources in spring wheat ND State Board of Agricultural Research & Education.$15,000

Zhong, S., Mergoum, M., Glover, K., and Anderson, J. Enhancing FHB resistance screening capacity and efficiency for spring wheat breeding programs-USDA-CSREES, Scab initiative. $8,815

Zhong, S., Xu, S, Chao, S-Fine mapping of QTL for FHB resistance in PI 277012 and introgression of the resistance into adapted spring wheat varieties. USDA-CSREES, Scab initiative $21,489
## I. Listing of active grants and contracts (Investigators, funding agency, total value)

<table>
<thead>
<tr>
<th>#</th>
<th>Investigators</th>
<th>Project Title</th>
<th>Funding Agency</th>
<th>Duration</th>
<th>Total Funds</th>
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<tbody>
<tr>
<td>1</td>
<td>Bergholz, T. and M. Wiedmann</td>
<td>Genomic elucidation of the physiological state of enteric pathogens on pre-harvest lettuce</td>
<td>Center for Produce Safety</td>
<td>Center for Produce Safety</td>
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<td>2</td>
<td>Dorsam, G. and J. Schuh</td>
<td>Eosinophil trafficking in fungal allergic asthma</td>
<td>NIH, Grant 1R15AI101968-01A1</td>
<td>January 15, 2013-December 31, 2015</td>
<td>$434,750</td>
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<td>3</td>
<td>Khaitsa, M. and A. Ekiri</td>
<td>Scholarships for Study Abroad Experience: International Animal Production, Disease Surveillance &amp; Public Health</td>
<td>NDSU Development Foundation Grant</td>
<td>2013</td>
<td>$5,000</td>
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<td>5</td>
<td>Khaitsa, M.L., D. Freeman</td>
<td>Capacity Building in Integrated Management of Transboundary Animal Diseases and Zoonoses in East &amp; Central Africa</td>
<td>USAID/HED</td>
<td>2010-August 2013</td>
<td>$1,100,000</td>
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<td>6</td>
<td>Khan, E., J. McEvoy, and X. Chu</td>
<td>Stagnant flood-water contamination in Thailand</td>
<td>NSF-RAPID</td>
<td>February 2012-December 2013</td>
<td>$50,000</td>
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<td>8</td>
<td>Porter, Hanson, J. Schuh</td>
<td>Innovative approach to assay development for the diagnosis of Invasive Aspergillosis</td>
<td>NIH/NIAID R21 AI092231-01 (collaborator)</td>
<td>2010-2012</td>
<td>$413,383</td>
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<td>Porter, Hanson, J. Schuh</td>
<td>Innovative assay development for the diagnosis of Invasive Aspergillosis</td>
<td>NIH/NIAID R21 AI085476-01</td>
<td>2010-2012</td>
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<td>10</td>
<td>Prüß, B.M.</td>
<td>Temporal and spatial expression of regulators affecting Escherichia coli biofilm formation</td>
<td>1R15AI089403-A1, NIH/NIAID</td>
<td>December 1, 2010 to November 30, 2013</td>
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<td>11</td>
<td>Prüß, B.M.</td>
<td>Research supplement to promote diversity in the health sciences.</td>
<td>1R15AI089403, NIH/NIAID</td>
<td>May 29, 2012 to November 30, 2013</td>
<td>$43,682</td>
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<td>Prüß, B.M.</td>
<td>Global gene regulation in Escherichia coli O157:H7 on the surface of beef</td>
<td>North Dakota Beef Commission</td>
<td>September 1, 2009 to June 30, 2013</td>
<td>$18,000</td>
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<td>14</td>
<td>Rahman, U.K., Shafiqur and M. Khaita</td>
<td>Development of an Electronic Nose System that can be used to identify Salmonella (S. Enterica) Pathogen in Poultry Manure</td>
<td>Scientific and Technological Research Council of Turkey (TUBITAK) - project number 1110577</td>
<td>May-June 2013</td>
<td>$2,500</td>
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<td>16</td>
<td>Schuh, J.</td>
<td>Grain dust exposure in the allergic lung</td>
<td>CS-CASH (NIH/NIOSH) Pilot grant 1U54OH010163-02</td>
<td>2012-2013</td>
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<td>17</td>
<td>Schuh, J. and G. Dorsam</td>
<td>HA in pulmonary allergic asthma</td>
<td>NIH/NHLBI R15 HL117254-01</td>
<td>2013-2016</td>
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<td>19</td>
<td>Sibi (PI), Cook (Co-PI), Dorsam (Co-PI), Guo (Co-PI), Schuh (Co-PI)</td>
<td>Proteases in Disease</td>
<td>NIH/NCRR-2P20RR015566; COBRE</td>
<td>2007-2012</td>
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<td>20</td>
<td>Sibi and J. Schuh</td>
<td>Major Equipment Grant, FACSJazz Fluorescence Activated Cell Sorter</td>
<td>ND EPSCoR/NSF</td>
<td>2012-2013</td>
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**Overall Total Funds** | $20,071,618 |
### Agricultural Communication

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<td>North Dakota Ag Mag</td>
<td>Sept. 1, 2012 – June 30, 2013</td>
<td>N.D. Department of Agriculture/N.D. Agriculture in the Classroom Council</td>
<td>Becky Koch</td>
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<td>Network Literacy Community of Practice Engagement Coordinator</td>
<td>Sept. 1, 2012 - May 31, 2014</td>
<td>eXtension</td>
<td>Bob Bertsch</td>
<td>$15,771</td>
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<td>Pesticide Videos</td>
<td>April 2, 2013 – Sept. 30, 2013</td>
<td>N.D. Department of Agriculture</td>
<td>Bruce Sundeen</td>
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Appendix 2 (Publications and Presentations)

Agricultural and Biosystems Engineering


Jia, X., T. DeSutter, Z. Lin, W. Schuh and D. Steele. 2012. Controlled drainage and subirrigation effects on


1. Abstracts (6)


2. Proceedings papers (19)


Rahman, S., M. S. Borhan and K. Swanson. 2012. Greenhouse gas (GHG) emissions from beef cattle pen surfaces in North Dakota. ASABE International meeting, Dallas, Texas.


3. National or International Invited Presentations (1)


4. Books (4)


5. Book Chapters

6. Research Reports (2)

Igathinathane, C. Estimating the volume of fruits and vegetables by machine vision. Northern Great Plains Integrator, NGPRL, USDA-ARS, Mandan, ND

Rahman, S. Composting Turkey Carcasses in the Northern Climate. North Dakota Turkey Board.

7. Popular Press articles

Magazine/Newspaper

Cool Stored Grain, Grainnet Breaking News, 8-24-12, www.grainet.com, 10K

Grain Yield Not Related to Test Weight, Grainnet Breaking News, 8-24-12, www.grainet.com, 10K


Articles

Cool Stored Grain, NDSU Crop and Pest Report, 9-13-12


Corn Harvest, Drying Challenging Again This Year, ND Corn Growers Newsletter, 10-12-12

Drought Could Harm Buildings, GrandForksHerald.com, 9-24-12

Grain Yield Not Related to Test Weight, Dairyherd Network, www.dairyherd.com, 8-22-12

Grain Yield Not Related to Test Weight, NDSU Crop and Pest Report, 9-13-12

Reconditioning Soybeans in Storage Poses Problems, www.mnsoybean.org, 10-12-12

News Releases

Corn Harvest, Drying Challenging Again this Year, 9-17-12

Dry Soil May Cause Building Problems, 9-7-12

Grain Yield Not Related to Test Weight, 8-22-12

Reconditioning Soybeans in Storage Poses Problems, 10-4-12

Poster Presentations

Efficient Home Energy Construction display. Carrington Research Extension Center. Carrington, North Dakota. 7-17-12


“Home Energy Basics” First time home buyers class in cooperation with the Villages Family Resource Center. Fargo/Moorhead. 7-9-12, 7-23-12 and 8-6-12

“Ideas for Saving” First time home buyers class in cooperation with the Villages Family Resource Center. Fargo/Moorhead. 7-9-12, 7-23-12 and 8-6-12

“NDSU Extension Energy Education Programming” North Dakota Rural Electric Cooperatives managers meeting. 8-14-12

Media

Market Journal, UNL - Nebraska Extension television program. Interview concerning farm shop energy use. 7-12-12

8. Reviewed Extension publications

Lemenager et al. Cow-calf production in the U.S. Corn belt. MWPS-66


WQ-1614 Baseline Water Quality in Areas of Oil Development

WQ-1031 Water Softening (Ion Exchange)

SF-1617 Evaluation of Soils for Suitability for Tile Drainage Performance

A-1133 Dry Bean Production Guide (Irrigation chapter)

AE-1637 Compatibility of ND Soils for Irrigation

9. Videos

Foundation Insulation Effectiveness: Basement Building Science

http://www.youtube.com/watch?v=kwn0Vjw_ii0

Foundation Insulation Effectiveness: Fiberglass Drainage Board

http://www.youtube.com/watch?v=Fl2N9DMTkWI

Foundation Insulation Effectiveness: Frost Protected Shallow Foundations

http://www.youtube.com/watch?v=GRiSf0vnmKc

Grain Drying and Storage Fan Characteristics, Part 1

http://www.youtube.com/watch?v=q620PI_YkOQ

Grain Drying and Storage Fan Characteristics, Part

http://www.youtube.com/watch?v=QIRejF2Wc18

Measuring the Pumping Plant Efficiency of a Typical Irrigation System

http://www.youtube.com/watch?v=bbcFl15R-mU

Checking the Uniformity of the Sprinklers on a Center Pivot: "The Can Test"

http://www.youtube.com/watch?v=dSTQE-VzMkM
10. **Webinars**

Improving Grain Drying Energy Efficiency

Plant Management Network, 10-18-12

Soybean Storage, 10-18-12

**Software**

Soil Water Compatibility GIS: worked with the ND State Water Commission, Water Appropriation division to include soil/water compatibility GIS overlay on the Interactive Map Service
**Agribusiness and Applied Economics**

2012 Journal Articles (accepted)

Barefield, Alan, Kathleen M. Tweeten, Sources of Secondary Data, Mississippi State University, 2012.


2012 Book Chapters


2012 Departmental Reports

2012 No. 703
Crop Insurance Adjusted Panel DEA Efficiency Measure, Shaik, Saleem

2012 No. 702
Renewable Energy Industries' Contribution to the North Dakota Economy, Coon, Randal C., Nancy M. Hodur, Dean A. Bangsund

2012 No. 701
Re-Examination of Production, Cost and Restricted Profit Functions using Quantile Regression Approach, Shaik, Saleem, Jacklin Beatriz Marroquin

2012 No. 700
Financial Characteristics of North Dakota Farms 2002-2011, Swenson, Andrew L.

2012 No. 699
Economics of Using Flared vs. Conventional Natural Gas to Produce Nitrogen Fertilizer: A Feasibility Analysis, Maung, Thein, David Ripplinger, Greg McKee, David Saxowsky

2012 No. 698
A Survey of the Awareness and Use of BMPs on North Dakota Beef Operations, Hadrich, Joleen C.

2012 No. 697

2012 No. 696
2012 No. 695

2012 No. 694
Modeling Direct and Secondary Employment in the Petroleum Sector in North Dakota, Bangsund, Dean A., Nancy M. Hodur

2012 No. 693
Results of the North Dakota Land Valuation Model for the 2012 Agricultural Real Estate Assessment, Aakre, Dwight G., Ronald Haugen

2012 No. 692

2012 No. 691

2012 No. 690
Economic Impact of the North Dakota University System in 2011, Coon, Randal C., Dean A. Bangsund, Nancy M. Hodur

2012 No. 689
Economic Contribution of the Sugarbeet Industry in Montana and Western North Dakota, Bangsund, Dean A., Nancy M. Hodur, F. Larry Leistritz

2012 No. 688
Economic Contribution of the Sugarbeet Industry in Minnesota and North Dakota, Bangsund, Dean A., Nancy M. Hodur, F. Larry Leistritz
### Animal Sciences

#### Refereed Journal Articles Published

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Journal/Conference</th>
<th>Pages</th>
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<tbody>
<tr>
<td>The Equine Anatomy Project: student perceptions of a necropsy lab.</td>
<td>Berg, E.L.</td>
<td>North American Colleges and Teachers of Agriculture</td>
<td>56:30-33</td>
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Refereed Journal Articles Accepted


Dyer, N; K.B. Register, D. Miskimmins, and T.K. Newell. Necrotic pharyngitis associated with Mycoplasma bovis infections in American bison (Bison bison); In press; Journal of Veterinary Diagnostic Investigation.


Schroeder, J.W., W.L. Keller, and D.B. Carlson. 2013. Canola or sunflower seed fed to lactating dairy cows increases conjugated linoleic acid in milk fat. IJAS. In press.


11. Abstracts

Abstracts Published


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<thead>
<tr>
<th>Citation</th>
<th>Journal</th>
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<tr>
<td>Authors</td>
<td>Title</td>
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Abstracts Accepted


Grazul-Bilska, A.T., E Berg, E Harris, S Kaminski, and KA Vonnahme. Maternal exercises may affect offspring reproductive system in pigs. 9th International Conference on Pig Reproduction, Olsztyn, Poland, 8-12 June 2013.


### 13. National or International Invited Presentations


**Caton, Joel. 2012.** Humboldt and Free University of Berlin and the Institut für Experimentelle Endokrinologie Charité Universitätsmedizin, Berlin, Germany (two separate lectures). Invited.

**Caton, Joel. 2013,** XVII Curso "Novos Enfoques na Producao e Reproducao de Bovinos" Uberlandia, MG, Brazil (two separate presentations). Invited.

**Dyer, Neil.** Lecture and laboratory instruction, School of Veterinary Medicine, Mongolian State University of Agriculture, Ulaanbataar, Mongolia, 9/29/12 – 10/13/12.

**Grazul-Bilska, Anna.** Diet before and during the periconceptual period: Effects on oocyte quality and early embryonic development in ruminants, Catalan Institution for Research and Advanced Studies (ICREA) of the Institute of Research in Agriculture and Technology (IRTA), Barcelona, Spain, July 2012.

**Redden, Reid.** American Sheep Industry Annual Convention, Phoenix, AZ.

**Redden, Reid.** Tri-State Wool Growers Convention, Jackson Hole, WY.


**Reynolds, Larry.** Significance of placental angiogenesis in compromised pregnancy. No Name Society, Lake Louise, Alberta, Canada, October 2012.
# 14. Books – None

# 15. Book Chapters

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Publisher</th>
</tr>
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</table>

# 16. Research Reports

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Journal</th>
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</thead>
<tbody>
<tr>
<td>Anderson, V.L, K.R. Maddock-Carlin, B.R. Ilse</td>
<td>Effect of feeding field pea and field pea components in finishing diets on feedlot performance, carcass traits, tenderness and taste panel response from four different muscles in beef cattle</td>
<td>NDSU Beef Cattle and Range Report, pp. 30-34.</td>
</tr>
<tr>
<td>Maddock Carlin, K.R.</td>
<td>Why do temperamental cattle have tougher meat</td>
<td>SBARE Animal Agriculture Grant Final Report.</td>
</tr>
</tbody>
</table>
### 17. Popular Press Articles

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Publication</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Berg, Eric.</td>
<td>The power of protein.</td>
<td>Fargo Forum, She Says column.</td>
<td>8/13/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Heat stress in beef cattle – Its cold now but it will get hot again.</td>
<td>Sidney Herald.</td>
<td>2/17/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Incorporating carcass ultrasound into beef operations.</td>
<td>Mountrail County Reporter.</td>
<td>1/17/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Open Cows – Was it the mud, the heat, or something else?</td>
<td>AgWeek.</td>
<td>4/16/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Perspectives after China; experiences from students and organizers.</td>
<td>Farm and Ranch Guide.</td>
<td>10/4/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Preliminary beef industry survey results.</td>
<td>Farm and Ranch Guide.</td>
<td>9/27/12.</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Technology at NDSU – INFocus on beef cattle.</td>
<td>Inforum.</td>
<td>5/3/12</td>
</tr>
<tr>
<td>Dahlen, Carl.</td>
<td>Alternate day feeding to reduce forage use.</td>
<td>Hay and Forage Grower.</td>
<td>12/14/12.</td>
</tr>
<tr>
<td>Lardy, Greg.</td>
<td>Grass tetany can be a concern in the spring.</td>
<td>Midwest Forage Association Newsletter. May 2012.</td>
<td></td>
</tr>
<tr>
<td>Lardy, Greg.</td>
<td>Lardy elected to national post.</td>
<td>NDSU Ag Communications. July 2012.</td>
<td></td>
</tr>
<tr>
<td>Lardy, Greg.</td>
<td>Specialists provide advice on early weaning calves.</td>
<td>Beef Daily.</td>
<td></td>
</tr>
<tr>
<td>Lardy, Greg.</td>
<td>Stokka joins NDSU Animal Sciences Department.</td>
<td>NDSU Ag Communications. July 2012</td>
<td></td>
</tr>
<tr>
<td>Maddock Carlin, Kasey.</td>
<td>LFTB.</td>
<td>AgWeek.</td>
<td>September 2012.</td>
</tr>
<tr>
<td>Newman, David.</td>
<td>NDSU to hold BBQ Boot Camp in Williston.</td>
<td>Williston Herald.</td>
<td>6/2/12.</td>
</tr>
<tr>
<td>Redden, Reid.</td>
<td>Sheep on shares.</td>
<td>Tri-State Livestock News.</td>
<td>5/16/12.</td>
</tr>
</tbody>
</table>
Schroeder, J.W. Canola possible forage crop for livestock. Ag Comm news release. 7/25/12.
Schroeder, J.W. Dairy efficiency. Ag Comm news release. 2/2/12.
Schroeder, J.W. Dairy Focus: Drought impacts feed costs and quality. Ag Comm news release. 7/16/12.
Schroeder, J.W. Dairy Focus: Is the cost of feeding frequency worth it? Ag Comm news release. 3/6/12
Schroeder, J.W. Dairy Focus: Many factors affect corn silage price. Ag Comm news release. 8/22/12.
Schroeder, J.W. Dairy Focus: Protecting hay more important than ever. Ag Comm news release. 9/6/12.
Schroeder, J.W. Dairy Focus: Reduce parasites with an integrated approach. Ag Comm news release. 7/5/12.
Schroeder, J.W. Farm safety includes a first aid kit. Ag Comm news release. 6/14/12.
Schroeder, J.W. Use caution with moldy feeds. KQLX radio. 4/17/12 and 4/23/12.
Stoltenow, Charlie. Drought-stressed crops high in nitrate can poison cattle. Successful Farming. 10/19/12.
Stoltenow, Charlie. West Nile is back. Ag Comm news release. 8/2/12.

18. Reviewed Extension Publications

Lardy, G. and C. Stoltenow. Preparing for a successful calving season, management and health programs. AS-1207.
Redden, R. 2012. Understanding sheep estimated breeding values. AS-1621 revised.
Schroeder, J.W. By-products and regionally available alternative feedstuffs for dairy cattle. AS-1180 revised.
Schroeder, J.W. Corn gluten feed, composition, storage, handling, feeding and value. AS-1127 revised.
Schroeder, J.W. Detecting and correcting off-flavors in milk. AS-1083 revised.
Schroeder, J.W. Feeding and managing the transition dairy cow. AS-1203 revised.
Schroeder, J.W. Feeding for MCP to dairy cow nutrition affects milk composition. AS-1118 revised.
Schroeder, J.W. Interpreting forage analysis. AS-1080 revised.
Schroeder, J.W. Mastitis control programs: bovine mastitis and milking management. AS-1129 revised.
Schroeder, J.W. Mastitis control programs: Proper milking techniques. AS-1126 revised.
Schroeder, J.W. Mastitis control programs: Troubleshooting a mastitis herd. AS-1128 revised.
Schroeder, J.W. Quality forage for maximum production and profit. AS-1117 revised.
Schroeder, J.W. Sampling feed for analysis. AS-1064 revised.
Schroeder, J.W. Strategies for fresh-cow management. AS-1358 revised.
Schroeder, J.W. Use of minerals in dairy cattle. AS-1271 revised.
Schroeder, J.W. Water needs and quality guidelines for dairy cattle. AS-1369 revised.
Stoltenow, C., Dyer, N., Stokka, G.L. Campylobacteriosis. V-1211

19. Videos

Dahlen, Carl. Backgrounding heifers: replacements or feeders? Extension educational video.
Dahlen, Carl. Backgrounding heifers: replacements or feeders? Extension educational video.
Dahlen, Carl. Pregnancy detection in beef cattle. Extension educational video.
Schroeder, J.W. YouTube video for agent inservice.
<table>
<thead>
<tr>
<th>Title</th>
<th>Source</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammer, Carrie. Equine nutrition and physiology. Webinar.</td>
<td>Farm Talk, KZLX radio.</td>
<td>8/17/12</td>
</tr>
<tr>
<td>Hammer, Carrie. Equine nutrition and physiology. Webinar.</td>
<td>Agribest Feeds.</td>
<td>5/14/12</td>
</tr>
</tbody>
</table>
School of Food Systems

Refereed journal articles


Casey R Johnson, Dil Thavarajah, and Pushparajah Thavarajah 2012. Phenolics and phytic acid affecting iron bioavailability in lentil (Lens culinaris L.). Journal of Food Composition and Analysis, Accepted with revision (JFCA-D-13-00052R1: this article was submitted in 2012).


Abstracts


Bergholz, PW, GT Ryan, S Warchocki, LK Strawn, and M Wiedmann. (Accepted) The potential role of riparian corridors in overland dispersal of bacteria among vegetable farms. 98th Annual Meeting of the Ecological Society of America. Minneapolis, MN.


Proceedings papers


National or International Invited Presentations


Paul Fenlason, Pushparajah Thavarajah, Juan Osorno, Dil Thavarajah 2012. Slow Darkening of Common Dry Beans (Phaseolus vulgaris L.) and Micronutrient Composition. Summer Research Forum, Dietary Factors and Long-Term Consequences for Health, May 14-16, 2012, North Dakota State University, Fargo, USA.


Book Chapters


Popular Press articles
Dil Thavarajah, 2012. The North Dakota State University (NDSU) Pulse quality program: two-year progress and goals for the next three years. The Pulse (The official publication of the Northern Pulse Growers Association), October, 2012.

Dil Thavarajah and Pushparajah Thavarajah 2012. 2011 Pulse Quality Survey, NDSU, Fargo, ND, USA.

Dil Thavarajah and Pushparajah Thavarajah 2012. 2012 Pulse Quality Survey, NDSU, Fargo, ND, USA.

Pushparajah Thavarajah 2012. Low Digestible Carbohydrates for Improved Human Nutrition: New Opportunities for North Dakota Corn. CORN TALK. October/November 2012 Issue

School of Natural Resource Sciences

1. Refereed Journal Articles (Published or accepted) (61)


DeSutter, T., L. Cihacek, and S. Rahman. 2013. Application of flue gas desulfurization gypsum (FGDG) and its impact on wheat grain (Triticum aestivum L.) and soil chemistry. J. Environ. Qual. (Accepted)


Meyers, L.M., E.S. DeKeyser, and J.E. Norland. 2013. 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. Applied Vegetation Science. (Accepted)


2. Abstracts (45)


Saunders, O.E, A. Fortuna, J. Harrison, C.G. Cogger, E. Whitefield and T. Green. 2012. Use of manure treatment and microbial processes to mitigate gaseous losses of nitrous oxide and ammonia from incubated soil. In Annual meeting abstracts [CD-ROM]. ASA, CSA, and SSSA, Madison, WI. (graduate student advisor, project advisor)


3. Proceedings papers (28)


4. National or International Invited Presentations (23)


DeSutter, T. 2012. The chemistry of tiling and crusting. Soil and Water Workshop sponsored by NDSU Research and Extension.


DeSutter, T.M. 2012. Tile drainage basics. Minn-Dak Farmers’ Cooperative Growers Seminar. Wahpeton, ND.


5. Books (0)

6. Book Chapters (6)


7. Research Reports (39)


On 10/26/2012 an oral presentation “North Dakota soils: a priceless legacy” was given at the 24th North Dakota Governors History Conference (Invited presentation)


8. Popular Press articles (0)
9. Reviewed Extension publications (7)


10. Videos (1)

Franzen, D. Soil pit presentations at the Soil Health Tour, Forman, ND, Nov. 2012.

11. Webinars (0)
12. Software (1)
Franzen, D. Distributed a program developed by M.D. Franzen (student, Computer Science) that averages and arranges Greenseeker sensor and Holland Crop Circle sensor data into a usable form for ANOVA and regression analysis.
Plant Sciences

1. Refereed Journal Articles

Berti


Kamireddy, S.R., J. Degenstein, Y. Ji, and M.T. Berti. 2013. Pretreatment and enzymatic hydrolysis of kenaf 

Berti, M.T., and B.L. Johnson. 2013. Switchgrass establishment as affected by seeding depth and soil type. 
Ind. Crops Prod. 41:289-293.

Solis, A., I. Vidal, L. Paulino, B.L. Johnson, and M.T. Berti. 2013. Camelina seed yield response to nitrogen, 
sulfur and phosphorus fertilizer in South Central Chile. Ind. Crops Prod. 44: 132-138.

composition, and ethanol potential of individual and mixed herbaceous biomass species grown in North 

Berti, M.T., R. Nudell., and D.W. Meyer. 2012. Fall harvesting of alfalfa in North Dakota impacts plant 
density, yield, and nutritive value. Forage and Grazinglands, doi: 10.1094FG-2012-0925-01RS.

Rojas-Cifuentes, G.A., B.L. Johnson, M.T. Berti, and W.A. Norvell. 2012. Zinc fertilization effects on seed 
cadmium accumulation in oilseed and grain crops grown on North Dakota soils. Chilean J. Agric. Res. 

Cai

(2012) Homoeology of *Thinopyrum junceum* and *Elymus rectisetus* chromosomes to wheat and disease 
resistance conferred by the *Thinopyrum* and *Elymus* chromosomes in wheat. Chromosome Research 20: 699- 
715.

Introgression and characterization of a goatgrass gene for a high level of resistance to Ug99 stem rust in 
tetraploid wheat. *G3 (Genes, Genomes, Genetics)* 2: 665-673.


Carena

Carena, M.J. 2012. Intellectual property challenges and opportunities for developing maize cultivars in the 

Carena, M.J. 2012. Developing cold and drought tolerant short-season maize products for fuel and feed 


Dai


Deckard


Elias


Gramig


Hammond

Hatterman-Valenti


Helms


Horsley


Howatt


Iqbal


Johnson


Kandel


Kianian


Kumar A, Bassi FM, 18 coauthors, Kianian SF. 2012. DNA repair and crossing over favor similar chromosome regions as discovered in radiation hybrid of Triticum. BMC Genomics 13:339

Lee


Li

Gao, Y., and D. Li. 2012. Detecting salinity stress in tall fescue based on single leaf spectrum. Scientia Horticulturae 138:159-164.


Lym


Manthey


Marais


McCLean


McMullen


McPhee


**Mergoum**


Osorno


Rahman


Ransom


Robinson


Schwarz


Simsek


**Thompson**


**West**


**Zhang**


**Zollinger**


**Zuk**

Zhang, Q., A. Zuk and K. Rue 2012. Salinity, waterlogging and their combined effects on germination and seedling growth of four Turfgrass species. Accepted for publication. Online. Applied Turfgrass Sci.

2. Abstracts

Berti


Cai


Carena

Christoffers

Dai

Elias


Ghavami


Kianian, P. M. A. and F. Ghavami. 2012. Student learning of the nature of science in the Genetics classroom. Plant Biology Conference (ASPB). Austin, TX, USA


**Gramig**


**Hatterman-Valenti**


**Howatt**


**Horsley**

Iqbal


Johnson


Kandel

Awale, R., A. Chatterjee, J. K. Ransom, and H. Kandel. 2012. Effect of Tile Drainage and Nitrogenous Fertilizers on Nitrous Oxide Emissions from Corn Fields under High Clay Soil. ASA annual meeting, Cincinnati, OH.

Kianian


Li

Gao, Yang; Li, Deying. 2012. Responses of compositional mixes of Kentucky bluegrass, creeping red fescue, and alkaligrass to ice melter. ASA, CSSA and SSSA Annual Meetings [2012]. p. 71578.


Zhang, Qi; Wang, Sheng; Rue, Kevin; Li, Deying; Hatterman-Valenti, Harlene. 2012. Boron tolerance in four turfgrass species. ASA, CSSA and SSSA Annual Meetings [2012]. p. 75438.

Lee


**Manthey**


**Marais**


Davey Cookman and Francois Marais. Use of generation acceleration to enhance the transfer of Fusarium head blight resistance into hard red winter wheat. The 22nd International Triticeae Mapping Initiative and 4th National Wheat Genomics Committee Joint Workshop, June 24-29, 2012. Ramada Plaza Suites & Conference Center, Fargo, ND, USA.


McClean


McPhee


Mergoum


**Osorno**


**Rahman**


**Ransom**


**Simsek**


*Finalist for the ’AACC-I 2012 Best Student Research Paper Competition. M. Mendis is PhD degree student in Dr. Simsek’s program.*


*First place winner for the “Marketing & Management Division: Graduate Student Research Paper Competition” during IFT meeting in Las Vegas, NV.*


**Stachler**


Zhang


Zollinger


3. Proceedings/papers

Carena


Laude, T., and Carena, M.J. 2012. Improving North Dakota corn adapted maize populations by exploring useful genes from diverse germplasm. In 2012 Corn Utilization and Technology Conference, Indianapolis, IN.


Hatterman-Valenti


Howatt


Johnson

Kandel


Lym


Manthey


McPhee


Ransom


Stachler


Zollinger


4. National or International Invited Presentations/Other Presentations

Berti

Berti, M.T. Cropping systems for biomass feedstock production in the North Central Region, USA. 28 June, University of Bologna, Italy. Invited speaker

Berti, M.T. 2012. Double- and relay-cropping systems. ARS-USDA, North Central Soils Laboratory, field day August, 16, 2012, Morris, MN. Invited speaker

Cai

Understanding and manipulating the wheat genome for wheat improvement (Invited), Life Science and Technology Center, China Seed Group Co., Ltd., Wuhan, China, October 16, 2012.

Biotechnology: Research and Teaching (Invited), Hubei Vocational College of Biotechnology, Wuhan, China, October 26, 2012.

Kinetochore orientation and haploidy-dependent unreductional meiotic cell division in wheat (Invited), The National Key Laboratory of Crop Genetic Improvement, Huazhong Agricultural University, Wuhan, China, October 30, 2012.

FHB resistance in durum wheat: progress and challenge (Invited), The College of Plant Science and Technology, Huazhong Agricultural University, Wuhan, China, October 30, 2012.

Live a balanced life (Invited), The Journal Club, Huazhong Agricultural University, Wuhan, China, October 21, 2012.

Carena


Christoffers


Deckard

March 28, 2012. Introduction to College Teaching, NDSU College of Engineering, (Invited)

June 25 to July 6, 2012, World Agriculture. Ten two-hour lectures to 300 undergraduate students at China Agriculture University, Beijing, China. (Invited)


November 26, 2012, Documentaries and Agriculture in North Dakota and U.S., NDSU Wellness class. (Invited)

Elias


Gramig


Helms

I was an invited speaker at plot tour at Wyndmere, ND on Sept. 7, 2012.

Horsley


Update on barley varieties for North Dakota and application of technology to barley breeding. Invited talk at the Carrington Barley Day, March 2012, Carrington, ND.

Update on barley varieties for North Dakota and application of technology to barley breeding. Invited talk at the North Dakota Barley Show, March 2012, Osnabrock, ND.

Update on barley varieties for North Dakota at the Hettinger and Carrington RECs, and the Agronomy Seed Farm in July 2012, Casselton, ND.

Towards a DNA Fingerprint to identify barley cultivars that fit specific brewers’ needs. Volunteered talk at the World Brewing Congress, July 2012, Portland, OR.

NDSU Summer Intern Program. Invited talk to students at the University of Puerto Rico, Mayaguez, September 2012, Mayaguez, PR.

Barley Breeding at NDSU. Invited talk to employees of the USDA-FAS, October 2012, Fargo, ND.

Co-speaker on a presentation on the Department of Plant Sciences to SBARE. Invited talk to the SBARE board in December 2012 in Fargo, ND.

Update on wheat research in the Department of Plant Sciences. Invited talk to the North Dakota Wheat Commission, December 2012 in Fargo, ND.

Iqbal

November 19, 2012, Soybean resistance to sudden death syndrome, gene mapping and genomics analysis of root response. The Department of Biological Sciences, Forman Christian College; A Chartered University, Lahore, Pakistan. (Invited)

November 20, 2012, Genomic applications in dissecting soybean resistance to SDS. The Department of Microbiology and Molecular Genetics, The University of Punjab, Lahore, Pakistan. (Invited)

Johnson


Invited speaker. Northern Canola Growers Association Research Forum Meeting at the NDSU Alumni Center. Fall 2012. Attendees 30 to 35.

**Kalb**

The following are my formal presentations in 2012. I was Invited to these talks by local educators with the exception of the April 14 Dakota Garden Expo talks in Bismarck, which is an event I hosted.

- **Starting a Backyard Orchard** - March 13 Turtle Lake; April 14 Bismarck; May 3 McClusky; May 9 Napoleon; September 28 Fargo
- **Discovering New Technologies for Gardeners** - February 3 Fargo; April 23 Wishek; July 19 Mandan; July 26 and 27 Bismarck
- **New Hardy Roses for North Dakota** - March 27 Hettinger; March 27 Bowman; April 14 Bismarck
- **Trees That Sparkle in Spring** - March 27 Hettinger; April 14 Bismarck
- **Superior Vegetable Varieties for North Dakota** - April 14 Bismarck; July 24 Williston; September 28 Fargo
- **Ten Steps to a Fantastic Vegetable Garden** - March 12 Harvey; May 23 Selfridge
- **Flood Recovery for Lawns and Landscapes** - April 25 Minot
- **Mixing Flowers with Vegetables in the Garden** - May 10 Minot

NDSU educators across the state were provided with a weekly update of emerging pests and other timely concerns of gardeners. A series of 20 meetings were conducted using PowerPoint and Live Meeting web-conferencing tools.

- There were four formal and approximately twenty informal tours of the Dragonfly Garden, a research and demonstration garden established at United Tribes Technical College. Visitors included a group of scientists from Canada and Kosovo, members of the North Dakota State Horticultural Society, Native American youth leaders from across the region, and the Red Hat Club of Sheridan County.

**Kandel**

Soybean Production Challenges and Opportunities for 2013. Manitoba Agronomist Conference. University of Manitoba, Winnipeg, Canada. December 12, 8:45 – 9:30 a.m. [165].

Sustainable Oat Production in North Dakota and Water Management. Kellogg’s/Kashi and Grain Millers team. Fargo, August 22. 11-noon. [9].


Sunflower Production in North Dakota. Team from Tajikistan with Cochran Fellowship Program, USDA, NCI, Fargo. June 6, 10:30-noon [10].

Soybean Production in North Dakota. Team from Tajikistan with Cochran Fellowship Program, USDA, NCI, Fargo. June 6, 8:30-10:00 a.m. [10].
Sunflower Production in North Dakota. Japanese trade mission hosted by the ND Trade Office, NDSU Campus. February 29, 9-noon. [10].


Subsurface Water Management (Tiling) Myths and Facts. Agvise Soil Fertility Workshop, Grand Forks. January 5, 2-3:15 p.m. [185].

Subsurface Water Management (Tiling) Myths and Facts. Agvise Soil Fertility Workshop, Watertown, SD. January 4, 2-3:15 p.m. [120].

**Kianian**


**Lee**

Jan 5, 2012. “Use of plasma lights in growing tomato and lettuce,” an Invited talk, Department of Environmental Horticulture, the University of Seoul, South Korea. (Seminar)


June 14, 2012. “Efficacy of using LEP lights in the production of tomato and lettuce,” an Invited talk given to the annual meeting of the Korean Seedling Growers Association, Chungnam National University, Daejeon, South Korea. (Presentation)


Li


Li, D. NDSU turfgrass research update. Invited presentation to turfgrass managers and business owners. 21 July 2012. Ramada Hotel. Fargo, ND.

Lym

Attended and gave one presentation at the annual North Dakota Weed Control meeting Entitled “Invasive weed control Q and A with a touch of herbicide ballistic technology”. Mandan, ND. Graduate student Katie Conklin presented “Aminocyclopyrachlor for the control of troublesome species”. 10-12 Jan 12. Attendance 123. Invited.


Presented a weed id and control update at the Barnes County Weed Meeting. 28 June 12. 65 attended. Invited.

Attended DuPont University Investigators meeting to discuss their new herbicide aminocyclopyrachlor and present research results from NDSU. 17-19 July 12. Denver, CO. Invited.
Radio interview with Mick Kjar on Ag Country Radio concerning the duties of the President of the Weed Science Society of America and the use of atrazine in North Dakota. 5 Mar 12.

Radio interview with Mick Kjar on Ag Country Radio concerning the National Weed Resistant Summit, sponsored by WSSA and the National Academy of Sciences. 15 May 12

Plot tour with local DuPont Crop Protection researchers. 26 July 12.

Plot tour with national and international program directors from DuPont Crop Production 10-11 Sept. 12.

Plot tour with Dow AgroChemical researchers 18 Sept. 12.

Attended the Area II meeting of the North Dakota Weed Control Association and updated them on the invasive weed control research at NDSU.

**McClellan**


**McMullen**


May 8, 2013, Oat breeding and genetic resources for improving nutritional quality, NY Academy of Medicine, NYC, NY - Invited .

June 25, Oat Science in North America, China-Canada Oat Conference, Baicheng Agricultural University, Baicheng City, China-Invited.

July 10, Speaker at Hettinger REC Field Day – Invited.

July 11, Speaker at Dickinson REC Field Day – Invited.

July 17, Speaker at Carrington REC Field Day – Invited.

**McPhee**


Invited to present, “Pulse Crop Breeding at NDSU,” to an India Trade Team hosted by the USA Dry Pea and Lentil Council at the NCI, Fargo, ND, October 8, 2012.

Invited to present, “Pulse Crop Breeding”, at the Montana Pulse Days, Billings, MT, December 12, 2012.

Invited to present update on pulse crop breeding at:

Dickinson REC field day
Carrington REC field day
Carrington Pulse Day
Minot Pulse Day
Hettinger REC field day
NE Montana Pulse Plot Tour

September Interviewed by Minot TV station at Williston REC Field Day.

**Mergoum**

Nationally, I had 9 (nine) presentations in 2012 in different annual national/international conferences (see Abstract list). These are:

Five posters were presented in the 2012 ASA-CSSA-SSSA annual meeting at Cincinnati, OH, USA (See Abstracts list).

One presentation at Annual meeting of American Association of Cereal Chemists International.


One presentation at 22nd International Triticeae Mapping Initiative Workshop, June 25-29, 2012; Fargo, ND, USA.

I had numerous presentations for the International Trade Teams that visit ND for importing wheat from ND.

Statewide; I had also many presentations for our wheat growers in field days and also for state stakeholders and decision makers.

**Osorno**


**Robinson**

I made four presentations (three Invited) to approximately 80 growers and consultants during 2012. These presentations included invitations to speak in Grand Forks, Fargo, to industry, and to a visiting group of potato growers from Albania.

**Schwarz**


**Simsek**


**Stachler**


**Workshop** (presenters: J.M. Stachler, R. Zollinger, and M. Christoffers)

1. Weed Management Issues for Sugarbeet Agricultural Staff a. January 26, 2012 for SMBSC and Minn-Dak (24 people)

   b. February 20, 2012 for American Crystal (29 people)

   c. Titles I presented at both locations: i. Herbicide Resistance in MN and ND

   ii. Management of Glyphosate-Resistant Weeds in Sugarbeet

   iii. Management of Glyphosate-Resistant Weeds in Other Crops in the Rotation


   b. Title presented: i. Weed Resistance and General Management

**Thompson**


**West**

31 January 2012, Cold Hardy Breeding, North Dakota Urban & Community Forestry Association 2012 Annual Conference – Invited

**Zuk**


5. Books

Berti


McPhee


6. Book Chapters

Kianian


Hatterman-Valenti


Kianian


Simsek


7. Research Reports

Berti

Midwest Forage Association.

USDA-NIFA/SRGP 2011 Annual report.

SUNRISE quarterly reports

SunGrant quarterly reports

Hatterman-Valenti


Hatterman-Valenti, Harlene and Collin Auwarter. 2012. Simulated glyphosate drift to Red Norland seed potatoes. 2011 North Dakota Weed Control Research. yellow section, p. 34.

Hatterman-Valenti, Harlene and Collin Auwarter. 2012. Simulated glyphosate drift to Sangre seed potatoes. 2011 North Dakota Weed Control Research. yellow section, p. 35.

Mehring, Grant, Harlene Hatterman-Valenti, Collin Auwarter, Bob Smith and Blaine Schatz. 2012. Cover crops and kill methods to control weeds in dryland potato – Carrington. 2011 North Dakota Weed Control Research. yellow section, p. 36-38.


Hatterman-Valenti, Harlene and Collin Auwarter. 2012. Weed control, efficacy, and selectivity of Solida (rimulfuron) when applied PRE or early POST to Russet Burbank potatoes. 2011 North Dakota Weed Control Research. yellow section, p. 44.


Johnson


Kalb

The following research reports are available at www.dakotagardener.com/trials/results.html:


Recommended Vegetable Varieties for North Dakota Gardens. 2 pp.

Kandel


Li

Li, D. differentiating the physiological responses of creeping bentgrass to Carbonate, chloride, and sulfate salinity. USGA Research Summary, 2012.

Li, D. Seed Priming for Timely Establishment of Turfgrass. NCTGA News Letter 2012. ASA.


Lym


Manthey


Marais


Research Report: GF Marais. Progress made with the development of a winter wheat breeding program for the northern plains. North Dakota Wheat Commission, July 2012, Fargo, ND


Osorno


Rahman


Schwarz

Simsek


Stachler


Thompson


Zollinger


45 in 2012 North Dakota Weed Control Research, NDSU, Fargo, ND

8. Popular Press articles

Helms


Kandel

Trade Magazine Articles


News Releases

http://www.ndsu.edu/fileadmin/ihas/IHAS_Schedule/2012_Archive/ihas09282012.pdf


News Outlet Interviews


Interview with Cass County newspaper reporter about subsurface water management. March 2, 2012.


Radio / T.V. Interviews

K. Roseth, WDAY. NDSU agronomist says water control a must for flood diversion. Evening News.


R. Koenen, Red River Farm Network, 11:00-11:10 a.m. Water management in a drier year. At Northern Ag Expo, Fargo, November 28, 2012.


R. Koenen, Red River Farm Network, 11:00-11:10 a.m. Soybean maturity ratings and growing degree units. At Langdon plot tour. July 19, 2012.

M. Hergert, Red River Farm Network, 7:00-7:10 p.m. Soybean crop situation and benefits of controlled drainage. July 17, 2012.


M. Hergert, Red River Farm Network, 3:00-3:10 p.m. Benefits of tile for sugarbeet producers. March 5, 2012.


M. Kjar, KQLX, 3:45-4 p.m. Live. The 64th Flax Institute. February 14, 2012.


Manthey

Mark Hertsgaard, Newsweek magazine. Article on pasta and climate change published in December 10 issue. I provided general background on durum wheat.

Robinson

Valley Potato Grower Magazine


**Stachler**

**Media Interviews - Radio**


At least 15 additional radio interviews not currently listed

At least 2 TV interviews not currently listed

At least 6 interviews for national and local agricultural publications not currently listed

**Thompson**


**West**


Zuk


9. Reviewed Extension Publications

Christoffers


Hatterman-Valenti


Helms


Kalb

NDSU Horticulture/Forestry Team Update. These updates were published weekly and distributed to NDSU Extension Agriculture and Natural Resources educators from May 26 to September 20 (18 updates, each 4–8 pages).

NDSU Extension Publication H-1593. Lawn and Garden Care after a Flood.

Kandel


Contributions to the North Dakota Crop and Pest Report Newsletter


Kandel, H. Soybean and IDC. June 14, No. 8:6.


Kandel, H. Sunflower Management. May 24, No. 5:4-5.


Kandel, H. Canola Planting Date. May 10, No. 3:3-4.


Kandel, H. Flax Production. April 26, No. 1:3-4.

Lym


Manthey

North Dakota Durum Wheat Variety Trial Results for 2012 and Selection Guide. NDSU Extension Service, Fargo, ND. pp. 4. NA-1067 (Revised).

Marais

Joel Ransom and Gideon Marais (NDSU Main Station); Eric Eriksmoen (Hettinger Research Extension Center); Jason Riopel, Ducks Unlimited (North Central Research Extension Center); John Lukach (Langdon Research Extension Center); Glenn Martin (Dickinson Research Extension Center); Gordon Bradbury (Williston Research Extension Center); Blaine Schatz (Carrington Research Extension Center) North Dakota Hard Winter Wheat Variety Trial Results for 2012 and Selection Guide. A-1196.

Mergoum


Osorno


Rahman


Ransom

Revised variety trial selection guides, NDSU Extension Service: 5

*Articles in the Crop and Pest Report (issue):*

No. 1 April 26, 2012 “Small Grain Emergence and What Are Adequate Plant Stands”

No. 2 May 3, 2012 “Imbibitional Injury of Corn”

No. 4 May 17, 2012 “Early Season Drought Stress Impacts Wheat and Corn Development”

No. 5 May 24, 2012 “Corn Plant Populations and Replanting”
No. 6 May 31, 2012 “Weather and Corn Development 2012”

No. 7 June 7, 2012 “Frost Damage to Corn”

No. 8 June 14, 2012 “Best Stage for Applying Fungicides for Scab Control in Wheat and Barley”

No. 9 June 21, 2012 “Uneven Corn Emergence and The Floppy or Rootless Corn Syndrome”

No. 11 July 5, 2012 “Drought Stress Beginning to Impact Corn Growth”

No. 12 July 12, 2012 “Effect of High Temperatures on Small Grain Development and Yield”

No. 13 July 19, 2012 “Drought is Growing Concern for Late Season Crops”

No. 15 August 2, 2012 “Volunteer Pea or Small Grain for Animal Feed in the Fall”

(Kandel/Ransom)

No. 18 September 13, 2012 “Tips for Planting Winter Wheat Late”

**Robinson**

2013 Dakota Weed Control Guide contributor

Potato Extension Webpage (designed and maintained)

Potato Extension Facebook page

Potato Extension Twitter page

Potato Extension Google plus page

Potato Extension Pinterest page

**North Dakota Crop and Pest Report Newsletter**


Potato purple wilt top, Issue 14, page 8.


Glyphosate drift on seed potato fields, Issue 14, page 9.
Potato psyllids detected in potatoes, Issue 11, pages 4-5.

Malformed seed potatoes may have glyphosate carryover, Issue 5, page 6.


The potato extension webpage went live in November and it had 4,275 page views and of those 1,587 were unique page views. There were approximately 80 people that followed me through social media. I organized one news article that was picked up at least 5 news outlets. I did 17 radio interviews, primarily for Fargo, Grand Forks, or Grafton radio stations.

Simsek


Stachler


Newsletter Articles

At least 15 submitted to NDSU Plant and Pest Newsletter
At least 5 submitted to U of MN Newsletters

**Zollinger**


Growth Staging of Wheat, barley, and wild oat. NDSU Extension Circular. (Revised).

2012 Herbicide Compendium. NDSU Extension Circular (Revised).

NDSU Adjuvant Compendium. NDSU Extension Circular (Revised).

**10. Videos**

**McClean**

**Animations**

Glycolysis: An Overview  
(http://www.youtube.com/watch?v=8Kn6BVGqKd8&list=UUcSThfV7yiW9I5hXBnEk9Zg&index=1)

Meiosis  
(http://www.youtube.com/watch?v=-DLGfd-Wpr4&list=UUcSThfV7yiW9I5hXBnEk9Zg&index=2)

Plant Nutrition: Mineral Absorption (Part One)  
(http://www.youtube.com/watch?v=6aC-WTAWgOg&list=UUcSThfV7yiW9I5hXBnEk9Zg&index=3)

Mitosis  
(http://www.youtube.com/watch?v=C6hn3sA0ip0&list=UUcSThfV7yiW9I5hXBnEk9Zg&index=4)

**Plant Breeding Videos**

Norman Borlaug & The Green Revolution  
(http://www.youtube.com/watch?v=Lg9-HTtgFOk)

Shovelomics  
(http://www.youtube.com/watch?v=Tpkb3CLdY-U)

Genetic Variation and the Story of Stem Rust  
(http://www.youtube.com/watch?v=kd6B706ByZg)

Bean Plant Architecture  
(http://www.youtube.com/watch?v=wf_nOs7DP-o)

What’s Plant Breeding  
(http://www.youtube.com/watch?v=Ictxj3axUKg).

**Stachler**

**Presentation Videos for Pesticide Applicator Training**

1. The Impact of a Single Resistant Weed in a Field

2. Why is Foundation Weed Control Important?

3. Foundation Weed Control for Sugarbeet
11. Intellectual Property

Mergoum

Plant Variety Protection (PVP)

PVP for ‘Velva’ submitted.

PVP for ‘Prosper accepted. PVP# 201100402


Plant Pathology

1. Refereed Journal articles

Published in 2012


**Accepted or in press for 2013**


Condon, B. J., Leng, Y., Wu, D., Bushley, K. E., Ohm, R. A., Otillar, R., Martin, J., Schackwitz,


2. Abstracts


Dugyala S., Borowicz P., Brueggeman, R., and Acevedo, M. 2012. Histological characterization of wheat pre-and post-haustorial resistance components to the leaf rust pathogen Puccinia triticina. Phytopathology 102:S5.4


Liu, Z., Shelver, W. L., Faris, J. D., and Friesen, T. L. Functional analysis and localization of SnTox1, a necrotrophic effector produced by the wheat pathogen Stagonospora nodorum. 27th Fungal Genetics Conference, March 12-17, 2013, Pacific Grove, CA, Abstract P524


Wang, R., Leng, Y., and Zhong, S. 2012. The role of a velvet-like complex in fungal development
and virulence of the cereal pathogen *Cochliobolus sativus*. P0848 In: Plant and Animal Genome Conference XX, San Diego, CA.

Wang, R., Leng, Y., and Zhong, S. 2012. The role of a velvet-like complex in fungal development and virulence of the cereal pathogen *Cochliobolus sativus*. In: APS North Central Division Meeting, Wooster, OH.


3. Proceedings papers


4. **National or International Invited Presentations**


5. **Books**

6. **Book Chapters**


7. Research Reports


8. Popular Press articles


Knodel, J.J. 2012. Hornets, wasps or yellow jackets; Whatever you want to call them, are becoming a nuisance! Potato Bytes. August 21, 2012.


9. Reviewed Extension publications


10. Videos

Brueggeman R. participated in the Film ‘Seeds of Hope’. https://vimeo.com/49812292

Spider Mites in Corn – 2012 (Knodel): http://www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates/entvideos.htm#Corn

Spider Mites in Soybean – 2012 (Knodel): http://www.ag.ndsu.nodak.edu/aginfo/entomology/entupdates/entvideos.htm#Spider
11. Webinars

### Refereed Journal articles

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<tr>
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<td>15</td>
<td>Sasanya J. J, and M. L. Khaitsa</td>
<td>December, 2012</td>
<td>Epidemiology in times of bioterrorism.</td>
<td>British Journal of Medical and Health Sciences</td>
<td>1:26-69</td>
</tr>
<tr>
<td>17</td>
<td>Strawn, LK, ED Fortes, EA Bihn, KK Nightingale, YT Gröhn, RW Worobo, M Wiedmann, PW Bergholz</td>
<td>January 2013</td>
<td>Landscape and Meteorological Factors Affecting Prevalence of Three Foodborne Pathogens in Fruit and Vegetable Farms</td>
<td>Applied and Environmental Microbiology (spotlight article)</td>
<td>79:588-600</td>
</tr>
<tr>
<td>18</td>
<td>Tang, S., M. J. Stasiewicz, M. Wiedmann, K. J. Boor, and T. M. Bergholz*</td>
<td>Accepted in fiscal year, published August, 2013</td>
<td>Efficacy of different antimicrobials on inhibition of Listeria monocytogenes growth in laboratory medium and on cold-smoked salmon</td>
<td>International Journal of Food Microbiology</td>
<td>165(3):265–275</td>
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<td>Presenters</td>
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<td>1</td>
<td>berry, G</td>
<td>October, 2012</td>
<td>Biotechnology Development Impacts to Agriculture</td>
<td>Governor's Conference on North Dakota History. Bismarck, ND</td>
<td>Presentation</td>
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<td>2</td>
<td>Dorsam, G</td>
<td>September, 2012</td>
<td>The impact of hyaluronic acid on B lymphocyte recruitment and function in a murine fungal allergic asthma model</td>
<td>EPSCoR Conference, Grand Forks, ND</td>
<td>Presentation</td>
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<td>3</td>
<td>Ghosh, S., S. A. Hoselton, and J.M. Schuh</td>
<td>2012</td>
<td>Inactuation of RNA viruses via irradiation for vaccine development against porcine reproductive and respiratory disease syndrome virus (PRRSV) and swine influenza virus (SIV)</td>
<td>2013 North Dakota Academy of Sciences</td>
<td>Poster</td>
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<td>4</td>
<td>Mok, K., A. Vegi, and S. Ramamoorthy</td>
<td>April, 2013</td>
<td>Antibody responses to the non-structural proteins of Porcine Cicrovirus strain 2 (PCV2)</td>
<td>2013 North Dakota Academy of Sciences</td>
<td>Presentation</td>
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<td>6</td>
<td>Ssemadaali, M., L. Xue, and S. Ramamoorthy</td>
<td>April, 2013</td>
<td>In-Vitro replication of swine torque teno virus I (TTV1)</td>
<td>2013 North Dakota Academy of Sciences</td>
<td>Presentation</td>
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<td>7</td>
<td>Vegi, A. and S. Ramamoorthy</td>
<td>April, 2013</td>
<td></td>
<td>2013 North Dakota Academy of Sciences</td>
<td>Presentation</td>
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2. Abstracts – see presentations
3. Proceedings papers - NA
4. National or International Invited Presentations
<table>
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<tr>
<td>8</td>
<td><strong>Bergholz, T. M.,</strong> K. J. Boor, and M. Wiedmann</td>
<td>October 12-13, 2012</td>
<td>Exposure to salt stress increases subsequent nisin resistance in <em>Listeria monocytogenes</em> and is mediated via LiaR</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>9</td>
<td>Gemmeda R. D., D. Landblom, D. Doetkott, M. Muleme and M.L. Khaitsa</td>
<td>October 12-13, 2012</td>
<td>Prevalence and Characterization of Shiga toxin producing <em>Escherichia coli</em> (STEC) isolates O26, O45, O103, O111, O121, and O145 and virulence genes in STEC isolated from healthy feedlot and range cattle in western North Dakota (ND)</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>12</td>
<td>Libone, N. M.L. Khaitsa, D. Doetkott, S. Rahman</td>
<td>October 12-13, 2012</td>
<td>Occurrence of Shiga toxin-producing <em>Escherichia coli</em> (STEC) and <em>Salmonella</em> in Feedlot runoff</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
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<td>13</td>
<td>Lynnes, T., S.M. Horne, and B.M. Prüß</td>
<td>October 12-13, 2012</td>
<td>Effects of carbon and nitrogen sources on <em>Escherichia coli O157:H7</em> and <em>E. coli O157:H7 ΔflhC</em></td>
<td>72nd Annual North Central Branch of ASM (American Society for Microbiology) meeting at NDSU, Fargo, ND</td>
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<td>14</td>
<td>Nessa, L., and B.M. Prüß</td>
<td>October 12-13, 2012</td>
<td>Potential genes involved in the regulation of biofilm formation in <em>Escherichia coli</em></td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
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<td>16</td>
<td>Prüß, B.M., J. S. Stafslien, J.W. Daniels, and M. Irsfeld</td>
<td>October 12-13, 2012</td>
<td>Water jetting as a technique to quantify stability of bacterial biofilms</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>17</td>
<td>Samanta, P., S.M. Horne, and B.M. Prüß</td>
<td>October 12-13, 2012</td>
<td>Temporal and spatial gene expression in <em>Escherichia coli</em> biofilms</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>18</td>
<td>Sharma, A., S.A. Hoselton, and J.M. Schuh</td>
<td>October 12-13, 2012</td>
<td>A novel method for the delivery of grain dust in investigating allergic asthma-grain dust interactions</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>20</td>
<td>Tofteland, J., D. Landblom, D. Doetkott, M.L. Khaitsa</td>
<td>October 12-13, 2012</td>
<td>Prevalence of Shiga Toxin-Producing Escherichia coli O157H:7 in Beef Cattle at North Dakota State University Dickinson Research Extension Center, Dickinson, ND</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
<td>Presentation</td>
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<td>21</td>
<td>Thuptimdang, P., T. Limpiyakorn, J. McEvoy, B.M. Prüß, and E. Khan</td>
<td>October 12-13, 2012</td>
<td>Effects of silver nanoparticles on <em>Pseudomonas putida</em> KT2440 biofilm in different phases</td>
<td>72nd Annual North Central Brach of ASM (American Society for Microbiology) meeting at North Dakota State University, Fargo, ND</td>
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<td>26</td>
<td>Horne, S.M., J. Sayler, T. Lynnes, P. Samanta, and B.M. Prüß</td>
<td>January, 2013</td>
<td>Escherichia coli biofilm may favor a mixture of motile and non-motile bacteria</td>
<td>Bacterial Locomotion and Signal Transduction (BLAST) meeting in Tucson, AZ</td>
<td>Presentation</td>
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<tr>
<td>29</td>
<td>Khaitsa, M.L.</td>
<td>September 11, 2012</td>
<td>International Collaborative Opportunities: Education/Research/Outreach</td>
<td>Mississippi State University, College of Veterinary Medicine</td>
<td>Presentation</td>
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<tr>
<td>30</td>
<td>Landblom, T.D., D. Doetkott, R. Gemmeda, M. Muleme, S.</td>
<td>December 2-4</td>
<td>The Prevalence &amp; Characterization of Shiga toxin-producing Escherichia coli (STEC) serotypes from Feedlot and</td>
<td>93rd Annual Meeting of the Conference of Research Workers in Animal Diseases, Chicago, IL</td>
<td>Poster</td>
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<td>Olet and M.L. Khaitsa</td>
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<td>Range Cattle in the US Midwest</td>
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<td>Prüß, B.M.</td>
<td>2012</td>
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<td>Institute of Marine and Environmental Technology (IMET), Baltimore, MD</td>
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<td>Schuh, J.</td>
<td>January, 2013</td>
<td>Of mice and men: modeling the pathology of allergic asthma</td>
<td>Invited seminar for the Biology faculty and student body of Sam Houston state University, TX</td>
<td>Presentation</td>
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**International**

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<td>41</td>
<td>Mukiibi, H., R. Barigye, M. Khaitsa, E. Matovu</td>
<td>July 12-13, 2012</td>
<td>Retrospective Study of Human African Trypanosomiasis (HAT) Cases in Otuboi Sub-county, Kaberamaido District, Uganda between 2004 and 2010; A Partial Evaluation of Stamp-Out Sleeping Sickness (SOS) Campaign</td>
<td>USAID/HED funded International Conference &amp; Cultural Boma held at Sheraton Hotel Kampala, Uganda</td>
<td>Poster</td>
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<td>42</td>
<td>Muleme, M., R. Barigye, E.S. Berry, A.W. Wamono, M.L. Khaitsa, C. Ayebazibwe</td>
<td>July 12-13, 2012</td>
<td>Review on Vaccines and Vaccination Programs for the Control of Foot-and-Mouth Disease (FMD) Outbreaks in Uganda (2001 to 2010)</td>
<td>USAID/HED funded International Conference &amp; Cultural Boma held at Sheraton Hotel Kampala, Uganda</td>
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<td>43</td>
<td>Muleme, M., E.S. Berry, M.L. Khaitsa</td>
<td>July 12-13, 2012</td>
<td>Climate Factors and Disease Occurrence: Influence of Temperature and Precipitation on the Epidemiology of Lyme disease in North Dakota, Minnesota and Wisconsin (1990 – 2010)</td>
<td>USAID/HED funded International Conference &amp; Cultural Boma held at Sheraton Hotel Kampala, Uganda</td>
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<td>44</td>
<td>Muleme, M., N.J. Bryant, L. Kiedrowski, R. Gammeda, R. Mugabi, H. Mukiibi, M.L. Khaitsa</td>
<td>February 14-16, 2013</td>
<td>The practice of One Health in reduction of Infectious Disease burdens in communities: The case of a community engagement project to reduce Rocky Mountain spotted fever on an Indian reservation in South Western United States</td>
<td>First joint One Health Scientific Conference organized by Uganda Medical Association and Uganda veterinary Association, Hotel Africana, Kampala, Uganda</td>
<td>Presentation</td>
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<td>45</td>
<td>Muleme, M., A.W. Wamono, E.S. Berry, M.L. Khaitsa</td>
<td>February 14-16, 2013</td>
<td>Multi-factorial predispositions to emerging infectious diseases: A case of land cover and weather changes and their role in the increased occurrence of Lyme disease in North Dakota</td>
<td>First joint One Health Scientific Conference organized by Uganda Medical Association and Uganda veterinary Association, Hotel Africana, Kampala, Uganda</td>
<td>Presentation</td>
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<tr>
<td>46</td>
<td>Prüß, B.M.</td>
<td>2012? And 2013?</td>
<td></td>
<td>TM’s 1st World Molecular and Cell Biology Online Conference</td>
<td>Presentation</td>
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</table>

5. **Books**

None completed. Charlene Wolf-Hall is working with a publisher on a new food safety textbook covering microbial hazards in foods.

6. **Book Chapters**

NA

7. **Research Reports**

Several CRIS reports and project reports required by funding agencies and regional research projects.
Agricultural Communications

1. **Referred Journal Articles**  None

2. **Abstracts**  None

3. **Proceedings Papers**  None

4. **National or International Invited Presentations**
   Extension Disaster Education Network, Oct. 23-26, 2012, Tunica, Mississippi
   - NDSU and Other Phone Apps for Disaster Education – Becky Koch
   Association for Communication Excellence/National Extension Technology Conference, June 11-14, 2013, Indianapolis, Indiana
   - Tuning Up the One-Man Band: Shooting Tips for the Non-shooters, Bruce Sundeen and Scott Swanson
   - Flip Your Classroom – Bob Bertsch

5. **Books**  None

6. **Book Chapters**  None