

Grain Quality Newsletter

News and Highlights from NC-213: Marketing and Delivery of Quality Grains and BioProducts Coproducts.

Volume 35:2

NC-213 The U.S. Quality Grains Research Consortium

The Andersons Research Grant Program: Regular Competition is Announced

A large measure of the success of the NC-151/NC-213 Committee over its 25 year existence is due to the research funds made available on a recurring basis by The Andersons Agricultural Research Fund. This competition also aids in fostering collaboration between researchers, institutions and industry. Additionally, the goal of the The Andersons Research Grant Program is to develop new approaches and technologies to maintain or improve the quality of cereals and oilseeds from harvest to delivery, while preserving the environment, and maintaining consumer safety. These approaches and technologies must be developed and implemented if the U.S. is to remain at the forefront of the world's major producers. This program is focused on facilitating multidisciplinary, multistate, and multiagency collaborative research to address critical cereal and oilseed research issues.

This year's Request for Proposals focuses on, through historical RFP cover pages, the long heritage of this competition. On the cover you will see; "The Andersons Research Grant Program: Regular Competition...continuing a tradition of funding research excellence" and throughout the RFP you will see covers of past RFPs. For this competition, proposals will have the opportunity to receive up to \$25,000.00 per year for two years.

For complete details, please visit the NC-213 website.

Speaking of NC-213 History...

If you are new to NC-213 and want to learn about our beginnings and history, you might want to refer to our "NC-151/NC-213 The History of a Multi-State Research Project." This booklet was created by Marvin R. Paulsen, Ph.D., University of Illinois-Urbana. This booklet outlines the history of this Project from its beginning.

The booklet contains many informative sections devoted to: organizational beginnings, newsletters and publications five year work plans, officers, meetings funding opportunities and recognition.

This material is updated every year and released in time for the Annual Meeting.

To review this material and download it to share with colleagues, please visit the NC-213 website and click on the tab in the left column; "History-151 & 213."

The Grain Quality Newsletter is published and distributed at no charge to NC-213 (formerly NC-151) participants and supporters of research on "Marketing and Delivery of Quality Grains and BioProcess Coproducts."

Send your contributions, comments, suggestions, and subscription requests to:

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2015 International Grain Quality and Food Security Conference

Conference Canceled!!

We regret to announce that the 2015 International Grain Quality and Food Security Conference to be hosted in Manhattan, KS August 3-6 has been canceled due to low registration numbers.

Additionally, we do not want the lack of attendance to be perceived as a waste of resources to those traveling a great distance. We are very sorry for any inconvenience that this cancellation may be causing you. Refunds for registration will be processed within the next couple of weeks. If you have any questions, concerns or comments, please do not hesitate to let us know.

Warm Regards,

Conference Planning Committee
igqfsc-2015@ksu.edu

IGP Institute

NC-213
The US Quality Grains Research Consortium

KANSAS STATE UNIVERSITY

KANSAS STATE UNIVERSITY | IGP Institute
Department of Grain Science and Industry
www.grains.ksu.edu/igqfsc-2015 | igqfsc-2015@ksu.edu



As part of the ridge-tillage system practiced at the John Van Meter farm, OSU assistant farm manager Wayne Lewis cultivates for weed control in soybeans. (Photo by Keith Weller. USDA/ARS Photo Gallery.)

Latest News from Montana State University, Department of Agricultural Economics and Economics

Pea in rotation with Wheat Reduced Uncertainty of Economic Returns in Southwest Montana

Miller, P., A. Bekkerman, C. Jones, M. Burgess, J. Holmes, and R. Engel. 2015. *Agronomy Journal*. 107(2):541–550.

Abstract

Pea (*Pisum sativum*L.) is increasingly being rotated with wheat (*Triticum aestivum*L.) in Montana. Our objective was to compare economic net returns among wheat-only and pea-wheat systems during an established 4-yr crop rotation. The experimental design included three wheat-only (tilled fallow-wheat, no-till fallow-wheat, no-till continuous wheat) and three no-till pea-wheat (pea-wheat, pea brown manure-wheat, and pea forage-wheat) systems as main plots, and high and low available N rates as subplots. Net returns were calculated as the difference between market revenues and operation and input costs associated with machinery, seed and seed treatment, fertilizer, and pesticides. Gross returns for wheat were adjusted to reflect grain protein at “flat” and “sharp” discount/premium schedules based on historical Montana elevator schedules. Cumulative net returns were calculated for four scenarios including high and low available N rates and flat and sharp protein discount/premium schedules. Pea-wheat consistently had the greatest net returns among the six systems studied. Pea fallow-wheat systems exhibited greater economic stability across scenarios but had greater 4-yr returns (US\$287 ha⁻¹) than fallow-wheat systems only under the low N rate and sharp protein discount schedule scenario. We concluded that pea-wheat systems can reduce net return uncertainties relative to wheat-only systems under contrasting N fertility regimes, and variable wheat protein discount schedules in southwestern Montana. This implies that pea-wheat rotations, which protected wheat yield and/or protein levels under varying N fertility management, can reduce farmers’ exposure to annual economic variability.



News brief write up for general audience: <http://www.montana.edu/news/15554/msu-scientists-find-higher-economic-returns-when-grain-growers-use-pulse-crops-instead-of-fallow>

(Photo courtesy of: Montana State University, Department of Agricultural Economics and Economics. Research plot of comparable pea and wheat cropping systems at the Arthur H. Post Agronomy Teaching and Research Farm in Bozeman, Montana.)

Intensification of Dryland Cropping System for Bio-feedstock Production: Evaluation of Agronomic and Economic Benefits of Camelina sativa

Chen, C., A. Bekkerman, R. Afshar, K. Neill. 2015. *Industrial Crops and Products*. 71(September):114–121.

Abstract

Camelina (*Camelina sativa*L. Crantz) is a promising bioenergy crop, but a sustainable production system for this crop has not yet been well developed. There is also concern about competing land use between crop productions for bioenergy or food use. One approach to overcoming this concern and developing sustainable production systems for bioenergy crops is potentially replacing the fallow period in wheat-based cropping systems with bioenergy crops. The agronomic and benefits of growing camelina in rotation with winter wheat were evaluated in a replicated from 2008 to 2011 in the Northern Great Plains (NGP), focusing on the effects on wheat yield profitability of the cropping system. Average winter wheat yields were 2401 and 1858kg ha⁻¹ camelina and barley, respectively, representing a 13.2 and 32.8% winter wheat yield compared to the fallow-winter wheat rotation (2766kg ha⁻¹). Lower winter wheat yield in the systems were offset by 907kg ha⁻¹ camelina and 1779kg ha⁻¹ barley yields. Economic analyses existing market prices and production costs, the traditional fallow-winter wheat rotation net returns to growers due to substantially lower variable costs of the system. Scenario more optimized, lower cost camelina production practices show that the net profits of system could be closer to those in the fallow-wheat system. However, higher grain price grain yield of camelina are essential to attract producers to include camelina in their systems. Although the fallow-wheat system resulted in higher short-run net returns, the total biomass production and crop residue return to soil is much greater in camelina-wheat than fallow-wheat rotation, which is likely to improve soil quality and productivity in the long run.



replacing the economic rotation study and overall¹ following reduction alternative revealed that at provides greater analyses that use camelina-wheat and/or greater cropping

(Photo courtesy of: Montana State University, Department of Agricultural Economics and Economics. Anton Bekkerman, Associate Professor of Economics.)

Detecting and Segregating Black Tip-Damaged Wheat Kernels Using Visible and Near Infrared Spectroscopy

Paul R. Armstrong, Elizabeth B. Maghirang and Tom C. Pearson

Abstract

Detection of individual wheat kernels with black tip symptom (BTS) and black tip damage (BTD) was demonstrated using near infrared reflectance spectroscopy (NIRS) and silicon light-emitting-diode (LED) based instruments. The two instruments tested, a single kernel near-infrared spectroscopy instrument (SKNIRS) and silicon LED-based single kernel high-speed sorter (SiLED-SKS), were both developed by the Stored Product Insect and Engineering Research Unit, CGAHR, ARS-USDA, Manhattan, KS. Black tip damage was classified into 4 levels for the study ranging from sound, symptomatic (BTS) at two levels, and damaged (BTD).

Discriminant analysis models for the SKNIRS instrument could distinguish sound undamaged kernels well, correctly classifying kernels 80% of the time. Damaged kernels were classified with 67% accuracy and symptomatic levels at about 44%. Higher classification accuracy (81% to 87%) was obtained by creating only two groupings: (1) combined sound and lightly symptomatic kernels and (2) combined light and heavily damaged kernels. A linear regression model was developed from the SiLED-SKS sorted fractions to predict the percentage of combined BTS and BTD kernels in a sample. The model had an $R^2 = 0.64$ and a standard error of prediction of 7.4% showing it has some measurement ability for BTS and BTD. The SiLED-SKS correctly classified and sorted out 90% of BTD and 66% of BTS for all 28 samples after three passes through the sorter. These instruments can serve as important tools for plant breeders and grading facilities of the wheat industry that require timely and objective determination and/or sorting of different levels of black tip present in wheat samples.

Efficacy of Methyl Bromide for Control of Different Life Stages of Stored-Product Psocids.

C.G. Athanassious, M.M. Hasan, T.W. Phillips, J. Aikins, J.E. Throne Submitted to: *Journal of Economic Entomology*

Abstract

The psocid species *Liposcelis paeta* Pearman, *L. entomophila* (Enderlein), *L. decolor* (Pearman), *L. bostrychophila* Badonnel (Psocoptera: Liposcelididae), and *Lepinotus reticulatus* Enderlein (Psocoptera: Trogiidae) were evaluated in laboratory bioassays to determine their susceptibility to six concentrations of methyl bromide (0.027, 0.113, 0.280, 0.393, 0.452, and 0.616 g/m³) after 48 h of exposure at 27.5° C. The life stages that were evaluated were adults (for all species), nymphs (for all species except *Lep. reticulatus*), and eggs (for *L. entomophila*, *L. decolor*, and *L. bostrychophila*). Adults and nymphs were very susceptible, and complete mortality was recorded at concentrations between 0.027 to 0.280 g/m³. In contrast, eggs were by far more tolerant than adults and nymphs for all species tested. At 0.027 g/m³, mortality did not exceed 53%, while survival was high even at 0.113 g/m³. Complete (100%) egg mortality was recorded at 0.393 g/m³ for *L. decolor* and at 0.452 g/m³ for *L. entomophila* and *L. bostrychophila*; concentrations estimated to give 99% mortality for eggs of these three species were 0.710g/m³, 1.044g/m³, and 0.891g/m³, respectively. These results show that stored-product psocids are susceptible to methyl bromide, but concentrations of 0.452 g/m³ or higher should be used to control all life stages.

Registration of Nine Sorghum Seed Parent (A/B) Lines

R. Perumal, T. Tesso, K. D. Kofoid, R. M. Aiken, P.V. Vara Prasad, S. R. Bean, J. D. Wilson, T. J. Herald and C. R. Little Submitted to: *Journal of Plant Registrations*

Nine sorghum [*Sorghum bicolor* (L.) Moench] A1 cytoplasmic male sterile seed parent (A) and their maintainer (B) lines (KS133A [Reg. No. PL-289, PI 674016], KS133B [Reg. No. PL-290, PI 674017], KS134A [Reg. No. PL-291, PI 674018], KS134B [Reg. No. PL-292, PI 674019], KS135A [Reg. No. PL-293, PI 674020], KS135B [Reg. No. PL-294, PI 674021], KS136A [Reg. No. PL-295, PI 674022], KS136B [Reg. No. PL-296, PI 674023], KS137A [Reg. No. PL-297, PI 674024], KS137B [Reg. No. PL-298, PI 674025], KS138A [Reg. No. PL-299, PI 674026], KS138B [Reg. No. PL-300, PI 674027], KS139A [Reg. No. PL-301, PI 674028], KS139B [Reg. No. PL-302, PI 674029], KS140A [Reg. No. PL-303, PI 674030], KS140B [Reg. No. PL-304, PI 674031], KS141A [Reg. No. PL-305, PI 674032], and KS141B [Reg. No. PL-306, PI 674033]) were released by the Kansas State University, Agricultural Research Center, Hays, KS, in August 2014. These nine lines were developed from random mating between the selected germplasm (PI550610B, IS2692R, IS9454R, IS9335R) and different genetic male-sterile (GMS) ms3 populations including KP8B, B51-B (plant, purple; seed white; glume, black), ms3 tan, and white tan B06-41701-313 with different combinations using a recurrent selection followed by pedigree and backcross breeding methods. The lines KS133A/B to KS137A/B are early in maturity and come to flowering in 60 to 65 d, whereas the lines KS138A/B to KS141A/B are medium in maturity and come to flowering in 65 to 70 d. In general, these A/B lines are three-dwarf (*dw1*, *Dw2*, *dw3*, *dw4*) in height, are photoperiod-insensitive, and possess unique combinations of plant and seed color. All nine seed parent lines are tannin free, short in peduncle length, have panicles with good panicle exertion, and have combining ability for yield and standability.

International Calendar of Events



-August 3-6: "International Grain Quality and Food Security Conference" Manhattan, KS, USA. Contact: Kingsly Ambrose. Kansas State University, Department of Grain Science and Industry, Manhattan, KS, 66506, USA. Tel: +1 (785) 532-4091, E-mail: kingsly@ksu.edu, Web: www.ksre.ksu.edu/news/story/food_symposium042514.aspx. **(CANCELLED)**

-August 16-21: "17th Annual Practical Short Course on Food Extrusion: Cereals, Protein & Other Ingredients" College Station, TX, USA. Contact: Dr. Mian N. Riaz, Director, Food Protein R&D Center. Texas A&M University, College Station, TX 77843-2476 USA. Tel: +1 (979) 845 2774, Fax: +1 (979) 845 2744, E-mail: mnriaz@tamu.edu, Web: www.tamu.edu/extrusion, <http://foodprotein.tamu.edu/extrusion/sctvp.php>

-September 9-11: "2015 U.S. SOY Global Trade Exchange and 2015 Midwest Specialty Grains Conference and Trade Show" Minneapolis, MN, USA. Contact: Midwest Shippers Association. E-mail: staff@mnsippers.com, Web: www.grainconference.org

-September 12-17: "iba 2015 – The world's leading trade fair for bakery, confectionery and snacks" Munich, Germany. Contact: Cathleen Speerschneider, Project Manager iba. German Bakers' Confederation. Neustädtische Kirchstr. 7a 10117 Berlin, Germany. Tel: +49 (0)89 189 149-180, Fax: +49 (0)89 189 149-189, E-mail: speerschneider@ghm.de, Web: www.german-bakers.org, www.iba.de

-September 16-18: "The 65th Australasian Grain Science Conference: 'Grains for a Healthy Future'" Crowne Plaza Hotel Sydney, NSW, Australia. Contact: Prof. Les Copeland. Department of Plant and Food Sciences, The University of Sydney, NSW, 2006 Australia. E-Mail: les.copeland@sydney.edu.au, conference@ausgrainscience.org.au

-September 17-19: "BIOFACH America, All Things Organic" Baltimore, MD, USA. Contact: Web: www.biofach-america.com

-September 20-23: "2015 Annual Conference & Exhibition Functional Foods, Nutraceuticals, Natural Health Products and Dietary Supplements". Wuxi, China. Contact: ISNFF. E-Mail: isnffsecretary@gmail.com, Web: <http://isnff.org>

-September 30 – October 2: "VI. Sourdough Symposium: Cereal fermentation, Microbiology, Biochemistry, Technology, Genetic, Nutrition" Nantes, France. Contact: Bernard ONNO, Oniris Nantes and Hubert CHIRON, INRA BIA Nantes. Web: www.sourdoughsymposium.org

-September 30 – October 2: "Oilseed & Grain Trade Summit" Hyatt Regency Hotel. Minneapolis, MN, USA. Contact: HighQuest Partners. Ms. Sule Basa. E-mail: sule.basa@gmail.com, Web: www.oilseedandgraintrade.com

-October 1-4: "The 3rd International Symposium on Traditional Foods From Adriatic to Caucasus" Sarajevo, Bosnia and Herzegovina. Contact: E-mail: traditionalfoods2015@nku.edu.tr, Web: <http://traditionalfoods2015.nku.edu.tr>

-October 10-14: "Anuga, The International Food Fair for the Retail Trade and the Food Service and Catering Market" Koelnmesse. Cologne, Germany. Contact: E-mail: anuga@koelnmesse.de, Web: www.anuga.com

-October 14-16: "EFSA's 2nd Scientific Conference: Shaping the Future of Food Safety, Together" Congress Centre Stella Polare. Milan, Italy. Contact: The European Food Safety Authority, EFSA. Tel: +39 0521 036 111, E-mail: scientific.conference@efsa.europa.eu, Web: www.efsaexpo2015.eu

-October 18-21: "100th AACC International Annual Meeting" Minneapolis, MN, USA. Contact: Rhonda Willkie. AACCI Headquarters. 3340 Pilot Knob Road St. Paul, MN, 55121-2097, USA. Tel: +1 (651) 454 7250, Fax: +1 (651) 454 0766, E-mail: rwilkie@scisoc.org, Web: www.aaccnet.org/meetings/default.asp

-October 27-29: "Gulfood Manufacturing" Dubai World Trade Centre. Dubai, UAE. Contact: Web: www.gulfoodmanufacturing.com



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(Photo: Stock photograph.)