

Wheat Disease Research and Education

South Dakota Wheat Commission

Reporting period: July 1, 2015 – December 31, 2016

Project investigators:

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Report type: Final report

Research Summary:

Wheat disease education was made available to producers through private pesticide applicator trainings, commercial pesticide applicator trainings, crops clinics, Wheat Walks, West River Field School, SDSU IPM Field School, CPT variety trials, Draper Winter Wheat Meeting, farm shows, iGrow articles, iGrow Radio spots, news releases, weekly news columns, and other educational materials as handouts. Education was also provided to high school youth through educational displays and presentations at Women in Science in Sioux Falls. Winter wheat plots were established for a study focusing on ergot.

Introduction:

- *The Wheat Walk Tours provided an opportunity for producers to receive information on identifying and managing various wheat diseases, weeds, and insects, best management fertility practices and other agronomic information. The benefits of crop rotations, cover crops, and using resistant varieties were stressed. The Wheat Walks allowed producers to interact with Plant Pathology, Weed, Entomology, Soil Fertility, and Agronomy Field Specialists and/or State Specialists, discuss their concerns and get their questions answered in person. Handout material was provided to attendees for further reference.*
- *Extension staff assisted with general surveys of wheat diseases occurring over a representative portion of South Dakota in conjunction with other researchers. Information is needed on the occurrence of various wheat diseases in South Dakota to help justify both research and educational efforts. Periodic visits to wheat fields were made to document wheat diseases that are present in the field and collect samples for proper diagnosis through laboratory analysis.*

Description of Accomplishments:

“Wheat Walks” were held at four locations (Clark, Aberdeen, Pierre, & Wall,), with two different stops occurring in the Clark area. Approximately 52 producers attended the wheat walks this year. Each of the major topic areas of wheat production were represented, including: agronomy, entomology, soil fertility, plant pathology, and weed control. Caren Osmond, SD Wheat Inc, was also in attendance on the second day of the wheat walks. A specialist from each area gave a brief presentation on the major issues regarding wheat

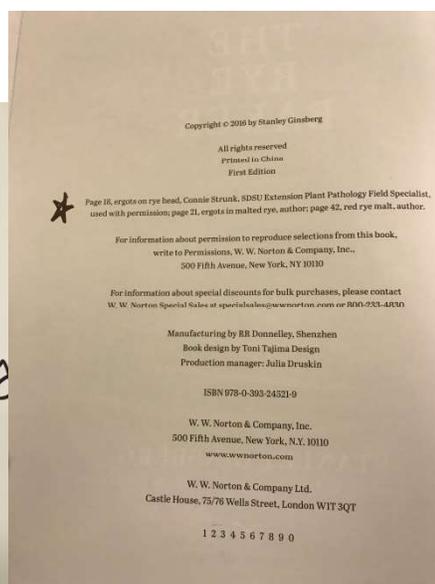
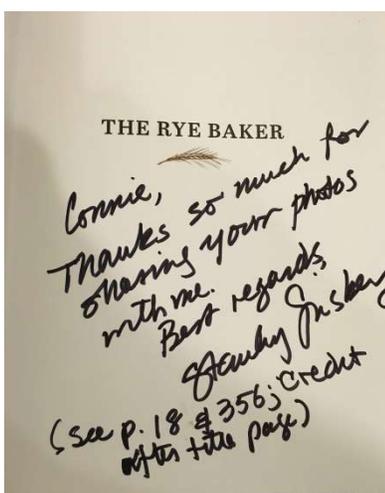
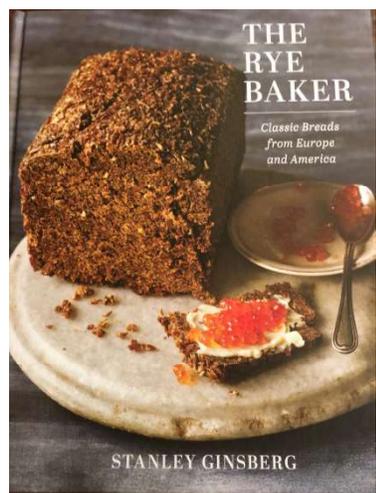
production in their topic area, and time was allowed for producers to interact with the specialists and ask questions. SD Wheat Inc. sponsored the refreshments at the conclusion of each meeting. Between the grant and sponsorship of the refreshments by SD Wheat Inc. we were able to offer the program without an additional registration fee.

Educational and research information focused on wheat was shared during the CPT Variety Trials in Ideal, Stanley County, Wall, Dakota Lakes Research Farm, Sully County, Potter County, Walworth County and Faulk County. Another educational meeting that information was shared at was the Winter Wheat Meeting which was held in Draper, SD.

A field survey was conducted in the vicinity of selected South Dakota Automatic Weather Stations to document the incidence and severity of Fusarium Head Blight (FHB or scab) and leaf spotting diseases.

When ergot emerged as a widespread problem in 2014 & 2015, the incidence of the disease in two of the spring wheat CPT trial locations were rated and documented. To further enhance the need for information regarding ergot, a field study was established in the Fall 2015 on spring wheat. After analyzing the ergot study data with SAS there is not a statistical difference between treatment if we look at 95% probability level, however, it is very close to being statistically different (Table 1).

Our content not only reaches South Dakota wheat producers but it attracts those from all over the United States and the world. As we write content we have to remember that and we must always be prepared to answer the many different questions or requests which come our way. A unique opportunity I had involved assisting an individual write a cook book focusing on rye. Stanley Ginsberg wrote "The Rye Baker" and I assisted with providing and educating him about ergot in rye. He asked if he could use a picture I took of ergot in rye and I am excited to say, the photo appears in his book. The photos below of his book are a result of my help and assistance.





Projections:

The Wheat Walks provided an excellent opportunity for producers to get up to date, research based information and interact directly with SDSU Extension Specialists. These efforts will be evaluated to determine how they should be continued.

If we are able to obtain some more wheat seed infected with ergot, we would like to re-run the ergot study. We hope to establish a few demonstration type plots to be used in conjunction with the Wheat Walks and any other educational meeting that may be appropriate. We also would like to pursue working with wheat producers on doing some on-farm research.

Publications/Data:

Ergot Study Results:

EN= No seed treatment on seed with ergot

ET= Seed with ergot treated

GT= Seed with no ergot treated

C.V.= Coefficient of Variance

NS = statistically non-significant yield differences between tested treatments at 0.05 probability level

Table 1. Average yields of spring wheat seeds applied with different treatment to control ergot.

Treatment	Yield (bu/a)
EN	60.9
ET	63.6
GT	59.5
Grand Mean	61.4
C.V.	3.5
LSD (0.05)	NS

Publications:

Byamukama, E., Langham, M., and **C. Strunk**. August 2015. Wheat Streak Mosaic of Wheat. Publication # 03-2005-2015. South Dakota State University, SDSU Extension, Brookings, SD. <http://igrow.org/up/resources/03-2005-2015.pdf>

Byamukama, E., **Strunk, C.**, Fanning, R., Szczepaniec, A., Bachmann, A., Deneke, D., and Johnson, P. (2016) Assessing Integrated Pest Management Implementation and Knowledge Gaps in South Dakota. *Journal of Extension* [Online], 54 (1) Article 1RIB7. Available at https://joe.org/joe/2016february/pdf/JOE_v54_1rb7.pdf.

IGrow articles:

Don't Forget the Small Grain In Rotations, 2-17-16 Ruth Beck and Emmanuel Byamukama <http://igrow.org/agronomy/wheat/dont-forget-the-small-grain-in-rotations/>

“Think Spring” Wheat Nutrition, 3-14-16 David Karki, Anthony Bly, and Sara Berg <https://igrow.org/agronomy/wheat/think-spring-wheat-nutrition/>

2016 Winter IPM Shortcourse Recap, 3-31-16 Emmanuel Byamukama, Amanda Bachmann, Adam Varenhorst, Paul O. Johnson, & Connie Strunk <http://igrow.org/agronomy/corn/2016-winter-ipm-short-course-recap/>

Stripe Rust: earlier than Normal Detection in Wheat is Concerning, 4-19-16 Emmanuel Byamukama, Ruth Beck, Shaukat Ali, and Connie Strunk <http://igrow.org/agronomy/wheat/stripe-rust-earlier-than-normal-detection-in-wheat-is-concerning/>

Winter Wheat: Scouting for Aphids Vectoring Barley Yellow Dwarf Virus This Spring, 4-28-16 Adam Varenhorst, Emmanuel Byamukama, David Karki, and Amanda Bachmann

<http://igrow.org/agronomy/wheat/winter-wheat-scouting-for-aphids-vectoring-barley-yellow-dwarf-virus-this-s/>

2016 SDSU Extension Wheat Walks, 5-12-16 Connie Strunk, Ruth Beck, and David Karki <http://igrow.org/agronomy/wheat/2016-sdsu-extension-wheat-walks/>

Assessing Hail Damaged Wheat, 6-2-16 David Karki and Connie Strunk <http://igrow.org/agronomy/wheat/assessing-hail-damaged-wheat/>

2016 SDSU Extension Wheat Walk Summary, 6-6-16 Connie Strunk <http://igrow.org/agronomy/wheat/2016-sdsu-extension-wheat-walk-summary/>

The Importance of Fungicide in Oats, 6-9-16 Jonathan Kleinjan, Emmanuel Byamukama, David Karki, Connie Strunk, Melanie Caffee <http://igrow.org/agronomy/other-crops/the-importance-of-fungicide-in-oats/>

Fungicide Application at Wheat Flowering: Using Scab Prediction Tools to Aid Decision, 6-13-16 Emmanuel Byamukama, Shaukat Ali, Dennis Todey, and Connie Strunk <http://igrow.org/agronomy/wheat/fungicide-application-at-wheat-flowering-using-scab-prediction-tools-to-aid/>

Root and Crown Rot Showing Up in SD Wheat Fields, 6-23-16, Ruth Beck, Connie Strunk, & Emmanuel Byamukama <http://igrow.org/agronomy/wheat/root-and-crown-rot-showing-up-in-s.d.-wheat-fields/>

The Value of Crop Residue, 7-28-16 Ruth Beck and Anthony Bly <http://igrow.org/agronomy/corn/the-value-of-crop-residue/>

Improving Protein Content in Wheat, 9-22-16 Ruth Beck <http://igrow.org/agronomy/wheat/improving-protein-content-in-wheat/>