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MPSG ANNUAL EXTENSION REPORT

PROJECT TITLE: Rotational effects and optimized spatial arrangement for wheat production in Manitoba

PROJECT START DATE: 1 May 2017 **PROJECT END DATE: 30 April 2021**

DATE SUBMITTED: 20 April 2018

PART 1: PRINCIPAL RESEARCHER

PRINCIPAL

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PART 2: EXECUTIVE SUMMARY

Outline the project objectives, their relevancy to pulse and soybean farmers, and a summary of the project to date, including methods and preliminary results.

Objectives: The objective of this research is to evaluate the performance of cereals in crop rotation with soybean and canola and to develop investigate the effects of wheat on optimized spatial arrangement practices to maximize wheat productivity while decreasing the effect of weeds and diseases for wheat production and other crops in rotation. The following key questions will be addressed:

1) What is the effect of including 1 vs. 2 wheat crops in rotation with canola and soybean (i.e., wheat-soybean-canola vs. wheat-soybean-wheat-canola) with different initial weed densities on crop productivity/quality, economic return, disease severity, weed management and herbicide-resistant green foxtail populations.
2) What is the optimum plant density and row spacing combination for modern wheat varieties and does the preceding crop (canola or soybean) affect this?

The three dominat crops in Manitoba currenlty include wheat, soybean and canola, making wheat the dominat cereal crop in an oilseed dominated rotation. Wheat is the most important cereal crop in this rotation and management of wheat and how it's frequency affects oilseed production is important for productivity, pest management and soil health for Manitoba crop producers.
Results from the first year of this study are still being analysed and evaluated. As this is a longer term rotation study, no major findings are ready to report.

PART 3: PROJECT ACTIVITIES AND PRELIMINARY RESULTS

Outline project activities, preliminary results, any deviations from the original project and communication activities. You may include graphs/tables/pictures in the Appendix.

In the 2017 field season, three field experiments were conducted within this project. The first experiment, the long-term rotation was converted to the poposed wheat-soybean-canola rotations with different cereal crop intensities and agronomic practices. The weed seedbanks were determined prior to planting using the coring method and grow-outs and the total amount and proportions of herbicide resistant and herbicide susceptible green foxtail were determined. Initial analysis indicates that previous GR1 herbicide use intensity affected the size of green foxtail seedbank and the proportion of herbicide resistant green foxtail seeds in the seedbank. Yield data were collected and grain quality data continue to be determined. An MSc graduate student, Deanna McLennan, is working on this aspect of the project. In addition, to crop performance, quality and and weed management, mycrorrhizal work has been initiated and sample evaluation and analysis continues.
Sample evaluation and initial effect of rotational crop and agronomic management practices of these crops on greeen foxtail population dynamics and other weeds will be determined in the spring of 2018.

The initial objectives have been achieved and the project continues to progress as planned. A poster describing the spring 2018 the result of the green foxtail seedbank densities and proportion of resistant plants as affected by the previous long-term rotaiton of wheat-flax-oats-canola was presented at the annual meeting of the Canadian Weed Science Society and the Manitoba Agronomist conference:

McLennan D, Gulden RH (2017) ACCase resistant green foxtail (Setaria viridis [L.] P. Beauv) in a long-term rotation study with different in-crop herbicide use intensities. Manitoba Agronomist Conference, Winnipeg, MB. Dec 13-14.

McLennan D, Gulden RH (2017) ACCase resistant green foxtail (Setaria viridis [L.] P. Beauv) in a long-term rotation study with different in-crop herbicide use intensities. Canadian Society of Weed Science CWSS-SCM Annual Meeting, Saskatoon, SK, Canada. Nov. 20-23.

APPENDIX

Include up to 1 page of tables, graphs, pictures.

No data are ready to report at this time.