

## **Crops Research Funding**

30 crop-related research projects	<b>\$7,730,038</b>
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### **Breakdown by Commodity**

Cereals	\$2,659,676
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Oilseeds	\$1,944,750
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Pulses	\$1,559,971
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Alternative Crops	\$50,000
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Miscellaneous Crops Related	\$1,515,641
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### **Breakdown by Organization**

University of Saskatchewan	\$5,316,787
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Agriculture & Agri-Food Canada	\$1,176,330
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University of Regina	\$552,000
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National Research Council	\$199,216
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Northeast Agriculture Research Foundation	\$80,255
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Saskatchewan Soil Conversation Association	\$89,250
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Saskatchewan Food Industry Development Centre	\$316,200
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## **Operational Funding**

Crop Development Centre	<b>\$6,250,000</b>
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## Cereals

### ***Improved Integrated Disease Management for Oats (*Avena sativa* L.) in Saskatchewan (20170205)***

Determine the impact plant populations have on optimal fungicide application.  
Determine integrated disease management strategies in Oats (*Avena sativa* L.).  
Understand the interaction of varietal resistance and fungicide application.

**ADF Funding:** \$80,255

**Western Grains Research Foundation:** \$80,255

**Saskatchewan Oat Development Commission:** \$30,000

**Organization:** Northeast Agriculture Research Foundation

**Contact:** Ms. Jessica Pratchler, (306) 231-4797

### ***Fusarium Head Blight Resistance to Triazole Fungicides in Western Canada (20170212)***

Developing molecular diagnosis markers for monitoring the prevalence of fungicide resistance in the population of *Fusarium graminearum* (F.g.) in Western Canada.  
Reporting the presence and prevalence of fungicide resistance in the population of F.g. in Western Canada.

**ADF Funding:** \$199,216

**Saskatchewan Wheat Development Commission:** \$85,378

**Organization:** National Research Council Canada

**Contact:** Dr. Ehsan Sari, Aquatic & Crop Resource Development, (306) 975-5587

### ***Scale-up Production and Field-testing of Biological Agents for Controlling Fusarium Head Blight in Wheat (20170257)***

Process development and scale-up for production of a fusarium specific mycoparasite that is indigenous to Saskatchewan.  
Solid state fermentation proof-of-concept to produce mycoparasites.  
Evaluate and optimize biomass recovery and downstream processing techniques.  
Optimize formulations for long-term shelf stability, efficient seed coating and field application.  
Evaluate the efficacy of the Biological Control Agents when produced at large-scale for field-testing.

**ADF Funding:** \$305,527

**Saskatchewan Wheat Development Commission:** \$53,916

**Organization:** University of Saskatchewan

**Contact:** Dr. Vladimir Vujanovic, Food & Bioproduct Sciences, (306) 966-5048

***An Integrated Approach for Enhancing Fusarium Head Blight Resistance in Durum (20170282)***

Identification of markers for with improved association to FHB resistance factors in durum.

Develop adapted durum germplasm with increased resistance to FHB and lower DON levels compared to current check cultivars.

**ADF Funding:** \$524,778

**Saskatchewan Wheat Development Commission:** \$499,814

**Pending Funds from Other Co-Funder:** \$475,408

**Organization:** University of Saskatchewan

**Contact:** Dr. Curtis Pozniak, Crop Development Centre, (306) 966-2361

***Post Harvest DON Reduction Strategies for Canadian Western Spring Wheat, Durum and Barley (20170292)***

To develop and examine strategies to reduce the Mycotoxin deoxynivalenol (DON) in Barley and Wheat post harvest on farm.

To examine strategies to reduce the Mycotoxin deoxynivalenol (DON) in Barley post harvest during seed cleaning.

**ADF Funding:** \$175,000

**Saskatchewan Wheat Development Commission:** \$75,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Rex Newkirk, Animal & Poultry Science, (306) 281-6611

***Developing Wheat Varieties for Added Value and Human Health (20170350)***

Introgress proprietary genes for elevated dietary fibre into high yielding, disease resistant CWAD using molecular approaches.

Identify variation and association of genes for dietary fibre in elite germplasm from a global collection of breeding.

Characterize the impact of high dietary fibre wheat on end-use functionality of bread, noodles and pasta.

**ADF Funding:** \$1,374,900

**Organization:** University of Saskatchewan

**Contact:** Dr. Curtis Pozniak, Crop Development Centre, (306) 966-2361

## Oilseeds

### ***Defining Populations of Plasmodiophora brassicae with Near Isogenic Brassica napus Lines (20170055)***

To complete development of a set of single clubroot-resistance-gene *Brassica napus* (*B. napus*) lines proposed in ADF project #20130122.

To transfer a resistance gene (RcrM) originating from European canola cultivar “Mendel” into a spring-type *B. napus* line DH16516.

To define the populations of *P. brassicae* with the newly developed near isogenic lines.

To transfer Rcr8 and Rcr9 from *B. rapa* into *B. napus* line DH16516.

**ADF Funding:** \$213,375

**Saskatchewan Canola Development Commission:** \$71,125

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Dr. Fengqun Yu, Saskatoon Research Centre, (306) 385-9375

### ***Crop Coefficient Development for Canola and Dry Bean in Saskatchewan to Improve Yield and Water Use Efficiency (20170058)***

To determine crop evapotranspiration (ETc) and develop crop coefficients (Kc) for canola and dry bean in Saskatchewan.

**ADF Funding:** \$221,848

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Mr. Hakibu Tanko, (306) 523-6725

### ***Insect Protein and Fat from Thin Stillage and Canola Meal (20170133)***

Develop a system for feeding thin stillage to black soldier fly larvae.

Optimize thin stillage nutrients for black soldier fly growth and composition.

Determine the quantity and composition of black soldier fly larvae meal for flies raised on thin stillage.

**ADF Funding:** \$234,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Martin Reaney, Plant Sciences, (306) 966-5027

***Soil Health and Nutrient Uptake among Diverse Canola Lines – Added Value to Crop Phenotyping (20170182)***

Identify nutrient uptake patterns among diverse canola lines at multiple field sites in Saskatchewan.

Provide supporting soil and plant nutrient data to aboveground phenotyping data to strengthen a field-based phenotyping package.

Quantify soil properties and plant-available nutrients in different soils under diverse canola lines.

Identify nutrient uptake patterns and quantify soil nutrients among canola hybrids.

**ADF Funding:** \$57,529

**Saskatchewan Canola Development Commission:** \$14,382

**Organization:** University of Saskatchewan

**Contact:** Dr. Melissa Arcand, Soil Science, (306) 966-2562

***Introducing Germplasm from Wild Species to Increase Flax Genetic Diversity (20170198)***

Identification of regions of DNA (loci) responsible for pasmo resistance in the wild progenitor.

Development of *L. usitatissimum* × *L. bienne* as candidates for cultivar registration using recurrent and bulk selection.

Generation, growth and observations of *L. usitatissimum* × *L. bienne* interspecific populations, up to F5.

Identification of regions of DNA (loci) responsible for boll indehiscence in cultivated flax.

Generate breeding tools (domesticated × distantly related flax hybrids) to introduce novel traits into flax.

Generate allopolyploid plants with wild and domesticated flax as parents.

**ADF Funding:** \$353,138

**Organization:** University of Saskatchewan

**Contact:** Dr. Helen Booker, Crop Development Centre, (306) 966-5878

***Genomics & Molecular Marker Assisted Mapping Approach to Identify Disease Resistance Genes in Flax (20170199)***

Develop a user-friendly QTL-seq pipeline.  
Identify fusarium wilt resistance QTL, underlying candidate genes, and markers using bi-parental populations.  
Identify and characterize pasmo-resistant accessions and develop near isogenic lines (NILs) in a CDC Bethune background.  
Identify major & minor effect QTLs, underlying candidate genes, & markers for pasmo, powdery mildew, & fusarium wilt in expanded flax core collection.

**ADF Funding:** \$325,628

**Western Grains Research Foundation:** \$325,627

**Organization:** University of Saskatchewan

**Contact:** Dr. Helen Booker, Crop Development Centre, (306) 966-5878

***Next Generation Fungicides - Protecting Saskatchewan Crops Using a Revolutionary Approach for Controlling Persistent Crop Disease (20170241)***

Optimize the application of dsRNA to silence target genes in major pathogens.  
Develop new next generation fungicides against major Saskatchewan pathogens.  
Optimize the spray delivery formula to maximize the longevity of the dsRNA molecules.

**ADF Funding:** \$180,000

**Western Grains Research Foundation:** \$180,000

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Dr. Steve Robinson, Saskatoon Research Centre, (306) 385-9404

***Identifying the Optimal Root System Architecture (RSA) for Brassica Crops (20170283)***

To understand the level of natural variation of root system architecture (RSA) for *Brassica napus*.  
To identify the regions of the genome contributing to variation in RSA.  
To assess the value of identified variation for improving nitrogen-use efficiency (NUE).

**ADF Funding:** \$359,232

**Saskatchewan Canola Development Commission:** \$109,768

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Dr. Isobel Parkin, Saskatoon Research Centre, (306) 385-9434

## Pulses

### ***Identifying Microbial Communities that Increase Early Seedling Vigour and Improve Resilience to Root Rot in Pulse Crops (20170068)***

Identify changes within the microbial community of pulse seedlings that impact early seedling vigour and root rot resistance.

Compare and contrast lentil and pea seedling microbial communities during *Aphanomyces* infection.

Measure the microbial community changes that occur during root rot disease throughout the growth stages of crop development.

Understand the interactions between *Aphanomyces* biocontrol agents, *Rhizobium* inoculants and seedling microbes.

**ADF Funding:** \$279,000

**Organization:** University of Regina

**Contact:** Dr. Christopher Yost, Biology, (306) 585-5223

### ***Aroma/Flavor Encapsulation using Extrusion Technology and Saskatchewan Ingredients (20170157)***

Determine the aroma/flavor encapsulation capability with different formulations.

Determine the effect of extrusion parameters on aroma/flavor encapsulation.

**ADF Funding:** \$316,200

**Organization:** Saskatchewan Food Industry Development Centre

**Contact:** Dr. Shannon Hood-Niefer, (306) 964-1819

### ***Increasing Faba Bean Use in Pet Food and Aquaculture Feeds (20170176)***

Determine the maximal inclusion limit of faba bean meal and optimally fermented faba bean meal in dog food.

Determine the optimal inclusion of protein concentrate from unfermented and fermented faba bean meal for salmonid fish.

**ADF Funding:** \$126,120

**Western Grains Research Foundation:** \$126,118

**Saskatchewan Pulse Growers:** \$126,118

**Organization:** University of Saskatchewan

**Contact:** Dr. Matthew Loewen, Veterinary Biomedical Sciences, (306) 966-4005

***SNP Marker Panel for Profiling Pea Lines and Its Effectiveness in Breeding for High Seed Protein Concentration (20170219)***

Convert key SNP markers to Taqman assays for routine screening of breeding lines.  
Identification of trait linked SNP markers for multiple phenotypes.  
Validation of identified trait linked markers.  
Fine mapping of QTLs for identification of markers closely linked to traits.  
Breeding for high seed protein concentration.

**ADF Funding:** \$192,775

**Saskatchewan Pulse Growers:** \$192,775

**Organization:** University of Saskatchewan

**Contact:** Dr. Tom Warkentin, Crop Development Centre, (306) 966-2371

***Use of Germination Combined with Thermal Treatments to Improve the Functionality, Nutritional Value, & Sensory Quality of Lentil (20170235)***

To modify lentil seeds using germination followed by infrared heating.  
To modify lentil seeds using germination followed by convective heating with vacuum and roasting.  
To determine the chemical composition and functional properties of lentil flours from the modified seeds.  
To examine the nutritional value of lentil flours from the modified seeds.  
To compare the efficiency of the two drying methods on germinated lentil seeds and their different impacts on the properties.  
To evaluate the sensory quality of the modified lentil seeds and flours.

**ADF Funding:** \$384,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Yongfeng Ai, Food & Bioproduct Sciences, (306) 966-2139

***Pollen and Leaf Wax Lipidomics (20170239)***

Measure chemical lipid components by mass spectroscopy for pea leaf cuticles treated with heat stress.  
Measure chemical lipid components of pea pollen treated with heat stress.  
Relate Mid-IR results to chemical mass spectroscopy results, and to relate leaf to pollen results.

**ADF Funding:** \$48,126

**Organization:** University of Saskatchewan

**Contact:** Dr. Rosalind Bueckert, Plant Sciences, (306) 966-8826

### ***Development of Pre-packaged Pulse-based Meals to Ameliorate the Negative Health Consequences of Sedentary Behaviour (20170263)***

To develop pre-packaged pulse-based snacks/meals for easy/convenient consumer use.  
To conduct consumer sensory evaluations on the pre-packaged pulse-based snacks/meals developed in objective 1.  
To use the pre-packaged foods from objective 2 in a clinical trial to improve metabolic health in office workers.

**ADF Funding:** \$136,125

**Saskatchewan Pulse Growers:** \$136,125

**Organization:** University of Saskatchewan

**Contact:** Dr. Philip Chilibeck, Kinesiology, (306) 966-1072

### ***Adding Value to Lentil Using Fortification Technology – Dual Fortification to Address Fe and Zn Deficiency (20170275)***

Investigate suitable special packaging methods for final product.  
Fortify unpolished dehulled lentil with Zn (single fortification) and Fe and Zn (dual fortification).  
To improve the existing Fe and the Zn fortification processes and to conduct product testing.  
Evaluate sensory acceptability of Zn-fortified and Zn and Fe-fortified lentil.

**ADF Funding:** \$77,625

**Saskatchewan Pulse Growers:** \$77,625

**Organization:** University of Saskatchewan

**Contact:** Dr. Albert Vandenberg, Crop Development Centre, (306) 966-8786

## **Alternative Crops**

### ***Quinoa Insect Research (20170070)***

Determine the biology, life history and phenological development of the major insect pests of quinoa.  
Development of monitoring tools for *S. atriplicella* and the stem boring fly.  
Determine potential insect pest species infesting quinoa, their natural enemies and their importance as economic threats.

**ADF Funding:** \$50,000

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Dr. Boyd Mori, Insect Ecology & Population Genetics, (306) 385-9398

## Miscellaneous

### ***Online Decision Support Tool for Precision Agriculture and Irrigation Scheduling (20170067)***

Development of spatial tool for on-farm decision support.  
Validation of NDVI data sets generated using the spatial tool.  
Evaluate evapotranspiration/irrigation scheduling component of the spatial tool.  
Development of producer training and outreach package.

**ADF Funding:** \$151,875

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Mr. Evan Derdall, Science and Technology Branch, (306) 385-9383

### ***SKSIS-2: Enhanced Saskatchewan Soil Information for Sustainable Land Management, Phase 2 (20170115)***

Consult with user groups to identify key soil information to be added to the framework developed via SKSIS-1.  
Refine Saskatchewan regional and management-scale soil information through Digital Soil Mapping (DSM).  
Develop a Decision Support System (DSS) for Erosion and Biodiversity Protection focused on shelterbelts.  
Development of an Application Program Interface (API) including data uploading and downloading capabilities.

**ADF Funding:** \$102,642

**Western Grains Research Foundation:** \$102,642

**Organization:** University of Saskatchewan

**Contact:** Dr. Angela Bedard-Haughn, Soil Science, (306) 966-4291

### ***Accelerated Crop Production Systems for Saskatchewan (20170144)***

Develop and test accelerated cropping system in Saskatchewan.

**ADF Funding:** \$158,043

**Western Grains Research Foundation:** \$158,042

**Organization:** University of Saskatchewan

**Contact:** Dr. Christian Willenborg, Plant Sciences, (306) 966-8354

***Developing a Soil Health Assessment Protocol for Saskatchewan Producers (20170151)***

Identify the soil properties that best characterize soil health in the semi-arid prairies.  
Develop a new producer-oriented manual (soil health assessment protocol) for measuring soil health in Saskatchewan.  
Quantify the effects of medium- and long-term agricultural management (tillage system, crop rotation) on soil health.

**ADF Funding:** \$49,331

**Saskatchewan Canola Development Commission:** \$32,887

**Saskatchewan Wheat Development Commission:** \$32,887

**Western Grains Research Foundation:** \$49,330

**Organization:** University of Saskatchewan

**Contact:** Dr. Kate Congreves, Plant Sciences, (306) 966-8001

***Harnessing a Host-restricted Plant Pathogen for the Development of a Bioherbicide for Canada Thistle (20170197)***

Identify tagetitoxin biosynthetic genes, purify the toxin, and evaluate its potential as a standalone herbicide.  
Evaluate polymicrobial mixtures to identify synergies that maximize aggressiveness and specificity on Canada thistle.  
Identify *P. syringae* pv. *tagetis* strains that are highly virulent and cause the most bleaching and disease on Canada thistle.  
Evaluate leading single and polymicrobial formulations for potential application as pre-emergent weed control.

**ADF Funding:** \$273,000

**Organization:** University of Regina

**Contact:** Dr. John Stavrinos, Biology, (306) 337-8478

***Monitoring Soil Organic Carbon on Commercial Direct-seeded Fields Across Saskatchewan - Phase 4 (20170232)***

Quantify the nature of sequestered carbon on Saskatchewan farm fields to estimate its permanence and potential.  
Compare measured Soil Organic Carbon(SOC) change with modelled SOC change.  
Modelling also provides estimate of N<sub>2</sub>O emissions that may have occurred.  
Compare Prairie Soil Carbon Balance Project results with those from conventional small-plot experiments.  
Quantify the current soil carbon benefit for Saskatchewan farms from adoption of conservation agriculture cropping in 1996.

**ADF Funding:** \$89,250

**Saskatchewan Wheat Development Commission:** \$35,700

**Saskatchewan Canola Development Commission:** \$35,700

**Saskatchewan Pulse Growers:** \$35,700

**Saskatchewan Flax Development Commission:** \$8,925

**Saskatchewan Barley Development Commission:** \$8,925

**Prairie Oat Growers Association:** \$8,925

**Organization:** Saskatchewan Soil Conservation Association

**Contact:** Mrs. Gerry Burgess, (306) 371-4213

***Tools and Strategies for Mitigating Pesticide Impacts on Wetlands to Improve Sustainable Crop Production (20170238)***

Selectively monitor Saskatchewan wetlands for pesticide contamination to develop toxic risk models and a robust monitoring program.

Compare multiple field and wetland management practices to mitigate pesticide transport and wetland water contamination.

Model spatial distribution of pesticide use in Saskatchewan to identify regions, crops or pesticides with highest wetland toxicity.

Evaluate crop productivity and profitability of management practices to support sustainable farm planning and programs.

**ADF Funding:** \$691,500

**Organization:** University of Saskatchewan

**Contact:** Dr. Christy Morrissey, Biology, (306) 966-4433

***Crop Development Centre Operations (20170343)***

To access financial resources to provide management and technical services to CDC research and breeding operations.

**ADF Funding:** \$6,250,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Kofi Agblor, Crop Development Centre, (306) 966- 8195