Summary of ADF Projects, 2019

Crops Research Funding

44 crop-related projects	$12,020,568

Breakdown by Commodity

Cereals	$2,042,815
Oilseeds	$2,952,901
Pulses (includes the SRI)	$5,723,148
Alternative Crops	$496,050
Miscellaneous Crops Related	$805,654
	$12,020,568

Breakdown by Organization

University of Saskatchewan	$8,354,187
Agriculture & Agri-Food Canada	$2,079,811
Global Institute for Food Security	$561,600
Irrigation Crop Diversification Corporation	$75,420
National Research Council Canada	$275,000
Northern Quinoa Production Corporation	$120,050
POS Bio-Sciences	$200,000
Prairie Agricultural Machinery Institute - PAMI	$109,000
Saskatchewan Food Industry Development Centre	$115,000
University of Manitoba	$130,500
	$12,020,568

Crops Related Projects - Co-Funders

Western Grains Research Foundation	$1,748,313
Saskatchewan Wheat Development Commission	$551,001
Saskatchewan Canola Development Commission	$604,246
Saskatchewan Flax Development Commission	$109,800
Saskatchewan Oat Development Commission	$285,369
Alberta Wheat Commission	$278,043
Manitoba Wheat and Barley Growers Association	$37,000
	$3,613,772

Cereals

Establishing Resistance to Fusarium Head Blight by Improving the Wheat Immune System (20180001)

Identify Pathogen Recognition Receptors (PRRs), related to Fusarium Head Blight (FHB) disease in wheat.
Functional Validation of PRRs, to identify genomic resources associated with FHB resistance in wheat.

ADF Funding: $360,000

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Gopal Subramaniam, (613) 759-7619

Accelerating the Introgression of Enhanced Stem Solidness from Tall Wheatgrass to Spring Wheat (20180078)

To develop a solid-stem red spring wheat cultivar(s) via introgression of the stem solidness trait from tall wheatgrass sources.
To develop high-throughput molecular markers to track the introgression of stem solidness in wheat breeding programs.
To identify potential candidate genes related to stem solidness in lines of intergeneric origin.

ADF Funding: $81,022

Saskatchewan Wheat Development Commission: $124,500

Alberta Wheat Commission: $43,478

Organization: University of Saskatchewan

Contact: Dr. Pierre Hucl, Crop Development Centre, (306) 966-8667

Breeding High Anthocyanin Spring Wheat with Improved Quality (20180079)

To improve the underlying grain quality of high anthocyanin spring wheat.

ADF Funding: $129,750

Organization: University of Saskatchewan

Contact: Dr. Pierre Hucl, Crop Development Centre, (306) 966-8667

Building on Past Success: Furthering Our Understanding of Wheat Stripe Rust to Mitigate Disease and Improve Resistance (20180095)

Identify the most recent races and genetic lineages of the stripe rust pathogen in Canada.
Identify genes in the pathogen (Pst) virulent on stripe rust resistance genes (Yr) through genomic analysis.
Isolate stripe rust resistance genes in wheat relatives in preparation for gene cloning by AgRenSeq (association genetics with R gene enrichment sequencing).

ADF Funding: $189,750

Saskatchewan Wheat Development Commission: $112,533

Alberta Wheat Commission: $65,217

Manitoba Wheat and Barley Growers Association: $12,000

Organization: University of Saskatchewan

Contact: Dr. Randy Kutcher, Plant Sciences, (306) 966-4951

Development of Triticale Lines with Wheat-Like Baking Quality (20180109)

To identify triticale lines with baking quality approaching that of spring wheat.

ADF Funding: $99,935

Organization: University of Saskatchewan

Contact: Dr. Pierre Hucl, Crop Development Centre, (306) 966-8667

Developing Novel Technologies for Controlling Herbicide Resistant Wild Oat in Wheat (20180196)

The overall objective of this research project is to develop a weed control system for herbicide resistant wild oat in wheat.
Determine the weed control efficacy and crop damage when using herbicides applied between crop rows.
Determine the efficacy of utilizing precision, in-crop mechanical weed control techniques to control wild oat in wheat.
Screen unique herbicide modes of action for suppression of wild oat and / or reducing seed production.
Evaluate the efficacy of utilizing a combined system of inter-row herbicide application and precision mechanical weed control.

ADF Funding: $273,259

Saskatchewan Wheat Development Commission: $104,348

Alberta Wheat Commission: $104,348

Organization: University of Saskatchewan

Contact: Dr. Steven Shirtliffe, Plant Sciences, (306) 966-4959

Alternatives to Sm1: Hairy Glumes, Awns, and Egg Antibiosis for Managing Wheat Midge (20180216)

Development of a spring wheat line that carries the “hairy glume” (HG) trait, an awned trait and the Sm1 trait.
Testing the HG/Awned lines for wheat midge deterrence and reduction in damage under controlled laboratory conditions.
Testing the HG/awned lines for wheat midge deterrence and reduction in damage under field conditions.
Testing wheat midge resistance and genetic mapping of resistance genes for egg antibiosis (EA) from winter wheat line MAC-274.

ADF Funding: $204,621

Saskatchewan Wheat Development Commission: $114,620

Alberta Wheat Commission: $65,000

Manitoba Wheat and Barley Growers Association: $25,000

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Tyler Wist, (306) 385-9379

Breeding Milling Oat Varieties with Improved Agronomic, Quality and Disease Traits for Saskatchewan Oat Producers (20180260)

Produce improved milling oat varieties.
Produce 'hairless' groat milling oat lines.
Nutritional quality evaluation.

ADF Funding: $300,000

Western Grains Research Foundation: $1,014,500

Prairie Oat Growers Association: $225,000

Organization: University of Saskatchewan

Contact: Dr. Aaron Beattie, Crop Development Centre, (306) 966-2102

Development of Markers Linked to Oat Crown Rust Resistance to Help Breed Improved Oat Varieties for Saskatchewan Producers (20180264)

Evaluate crown rust reaction in bi-parental oat populations.
Qualitative genetic loci (QTL) mapping of crown rust resistance.
Development of high-throughput marker assays.

ADF Funding: $219,478

Western Grains Research Foundation: $184,696

Prairie Oat Growers Association: $34,782

Organization: University of Saskatchewan

Contact: Dr. Aaron Beattie, Crop Development Centre, (306) 966-2102

Eco-Friendly Non-Thermal Inactivation of* E.coli *in Wheat Flour Using Cold Plasma Technology (20180293)

To investigate the effect of the plasma treatment on flour properties such as bread-yeast growth, dough ripening and rheological.
To set up a cold plasma system suitable for treating wheat flour.
To investigate the effects of plasma operating conditions on the extent of inactivation of *E. coli* (measured in colony forming units).
Analyzing microflora of the flour before and after treatment.

ADF Funding: $185,000

Organization: University of Saskatchewan

Contact: Dr. Oon-Doo Baik, Agricultural and Bioresource Engineering, (306) 966-5320

Oilseeds

Sclerotinia Resistant Canola and HEAR Lines for Western Canada and Understanding the Molecular Basis of Resistance (20180021)

Determine the contribution of lectin genes to sclerotinia resistance in canola.
Determine the contribution of penetration-resistance genes to sclerotinia resistance in canola.
Determine the contribution of other candidate defense genes to sclerotinia resistance in canola.

ADF Funding: $270,000

Saskatchewan Canola Development Commission: $90,000

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Lone Buchwaldt, (306) 385-9417

The Effect of Flax Seeding Rate, Crop Placement, and N Rate on the Development and Yield of Chickpea and Flax (20180086)

To increase the production of flax in western Canada.
To determine if intercropping can be used to reduce disease pressure in chickpeas.
To determine if the area of adaptation for chickpeas can be expanded by utilizing an intercrop with flax.
To develop an agronomic system for intercropping chickpea with flax in Saskatchewan.
To improve the agronomic performance of flax.

ADF Funding: $172,400

Western Grains Research Foundation: $86,200

Saskatchewan Flax Development Commission: $86,200

Organization: Agriculture & Agri-Food Canada

Contact: Dr. William May, (306) 695-5225

Preserving Hybrid Vigour Through a Novel Apomixis Breeding Strategy in Brassica Crops (20180141)

Testing for stable inheritance of the apomixis trait in the bridging species.
Generating apomictic brassica crops via intergeneric crosses.
Identification of all apomixis factors in the backcrosses of de novo generated hybrid apomictic boechera and brassica crops.
Transfer of apomixis from selected diploid unbalanced apomictic boechera lines into sexual bridging species via hybrid crosses.
Generation of diploid, hybrid unbalanced apomictic boechera backcrosses.

ADF Funding: $561,600

Saskatchewan Canola Development Commission: $62,400

Organization: Global Institute for Food Security

Contact: Dr. Tim Sharbel, Seed and Developmental Biology, (306) 966-3709

Modified Lipid Metabolism to Deliver Improved Low Temperature Tolerance in Brassica Napus (20180160)

The goal is to apply a targeted approach to identify new traits to confer improved low temperature tolerance in seedling canola.
Evolution of enhanced cold tolerance through iterative selection.
Identify strategies to modify lipid metabolism to deliver improved, early season, low temperature tolerance in *Brassica napus* .
Determine the membrane lipid composition of *Brassica napus* seeds and seedlings in lines with different seed oil composition.
Test the hypothesis of a link between *B. napus* seed lipid composition and germination/seedling establishment at low temperature.

ADF Funding: $176,900

Saskatchewan Canola Development Commission: $67,100

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Mark Smith, (306) 385-9425

Upscaling the Extraction of Bio-Actives and Vitamins from Canola Crush By-Product (20180211)

Scaling up the extraction process of phytosterols from the deodorizer distillate of canola.
Formulation development for functional foods.
Extraction of vitamin E (tocopherols) from the deodorizer distillate of canola.
Brassicasterol efficacy testing.

ADF Funding: $246,976

Organization: University of Saskatchewan

Contact: Dr. Anas El-Aneed, Pharmacy and Nutrition, (306) 966-2013

Process Adaptation and Assessment of Market Development Constraints for Protein Products from Cold-Press, Genetically Modified (GM) Canola Meal (20180213)

To modify AAFC *Brassica* protein fractionation process to use cold-press canola meal.
To assess solid-state fermentation as pretreatment for cold-press and prepress-solvent extracted canola meals to improve protein recovery.
To evaluate canola meal protein fractions in applications based on functional attributes.
Assess consumer acceptance and market penetration constrains of genetically modified (GM)-canola based protein products.
Techno-economic analysis of cold-press canola operation in combination with canola.

ADF Funding: $346,500

Saskatchewan Canola Development Commission: $115,500

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Janitha Wanasundara, (306) 385-9488

Establishing Transgene-Free CRISPR/Cas9 Based Genome Editing Platform to Improve Canola Resistance Against Clubroot Disease (20180243)

Identify novel clubroot resistance genes and create novel resistance allelic variants in elite canola germplasms.
Establish transgene-free CRISPR/Cas9 based genome editing platform to support canola breeding programs.

ADF Funding: $267,375

Saskatchewan Canola Development Commission: $89,125

Organization: University of Saskatchewan

Contact: Dr. Wei Xiao, Microbiology and Immunology, (306) 966-4308

Oilseed with Depleted Glycosides and Metals (20180248)

Produce a whole flaxseed that is largely depleted in heavy metals.
Produce a flaxseed gum powder that is substantially free of metals and cyanogenic glycosides.
Produce a whole flaxseed that is substantially degummed and free of cyanogenic glycosides.
Produce flavoured flaxseed products that are a dietary source of omega three fatty acids, protein, and lignan.

ADF Funding: $94,400

Saskatchewan Flax Development Commission: $23,600

Organization: University of Saskatchewan

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

Electrostatic Conditioning of Vegetable Oil and Biodiesel (20180253)

Develop mathematical models that predict the behavior of specific vegetable oil contaminants in electric fields.
Determine if compounds can be refined from crude vegetable oil using dielectrophoresis.
Preparation and characterization of oils.
Emulation of a commercial dielectrophoretic filter in an experimental cell.
Study the fate of particulate matter in crude or partially refined oils when it is passed through a dielectric field.
Determine the mass balance of dielectrophoresis and compare it with conventional refining.
Study the fate of particulate matter in refined oils adulterated with a specific contaminant.
Determine if dielectrophoresis conditions affect oil quality.

ADF Funding: $297,000

Organization: University of Saskatchewan

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

Practical Oilseed Protein Products (20180255)

Scale up oil removal from hulls.
Scale up oil separation and refining.
Scale up processing of the meal aqueous ethanol extract.
Production of canola sugar, canola ethanol, and hull fuel. Scale up protein enrichment by aqueous ethanol.
Scale up commercial processes to separate oilseed hulls. Scale-up low temperature oil removal from oilseed.

ADF Funding: $389,250

Saskatchewan Canola Development Commission: $129,750

Organization: University of Saskatchewan

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

Commercial Extraction of Canolol from Ground Mustard By-Products Press Cake for Nutraceutical and Cosmetics in Saskatoon (20180324)

Prevention of lipid oxidation and the delivery of canolol via oil-in-water emulsion.
To develop a new commercial technology for super antioxidant "canolol" extraction.

ADF Funding: $130,500

Organization: University of Manitoba

Contact: Dr. Usha Thiyam, Food and Nutritional Science, (204) 474-9976

Pulses

Nitrogen Fertilization of Irrigated Dry Bean (20180081)

Determine nitrogen fertilizer rate yield responses for pinto market class irrigated wide row dry bean production.
Determine whether ESN nitrogen fertilizer is beneficial compared to urea as a fertilizer nitrogen source for irrigated dry bean.

ADF Funding: $75,420

Organization: Irrigation Crop Diversification Corporation

Contact: Mr. Garry Hnatowich, (306) 867-5405

Oil Emulsifier from Chickpea (20180091)

Optimize parameters to maximize aquafaba-based emulsifier functionality and stability.
Collaborate with CDC to identify chickpea cultivars that produce the superior aquafaba emulsifier.
Develop new food products using aquafaba based emulsifier.
Determine the safety, the antinutritional and the nutritional value of the emulsifier.
Standardize the process of emulsifier extraction from chickpea seed.
Pilot plant scaleup value-added process to extract emulsifier from chickpea.
Publish the optimized value-added process for extraction of aquafaba from chickpea .
Publications and patents.

ADF Funding: $360,000

Organization: University of Saskatchewan

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

Fungicide Timing to Manage Ascochyta Blight in Chickpea Varieties with Contrasting Ascochyta Resistance (20180116)

To evaluate the effectiveness of *Ascochyta rabiei* resistance in new chickpea varieties under different fungicide regimes.
To measure the frequency of seed-to-seedling transmission of *A. rabiei* from chickpea with different disease resistance.
To assess fungicide insensitivity in *A. rabiei* chickpea plant matter exposed to different fungicide regimes.
To assess the impact of the number of fungicide sprays on *Ascochyta* in chickpea varieties with differing resistance.
To assess the inoculum potential of the residue remaining in the field post-harvest.
To evaluate *A. rabiei* infection in seeds produced by chickpeas grown under contrasting fungicide regimes.
To assess the impact of a very early fungicide application on *Ascochyta* in chickpea varieties with contrasting resistance.
To evaluate interactions between IMI herbicide tolerance and *A. rabiei* resistance.

ADF Funding: $161,720

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Michelle Hubbard, (306) 770-4461

Developing Ingredients from Wrinkle Peas Using Wet Isolation Techniques (20180132)

Determine whether it is more efficient to use wrinkle peas for wet isolated ingredients.
Develop the knowledge to help the pulse industry find value propositions for wrinkled peas.
To innovate for developing new ingredients using enzymes on the proteins and starches.
To determine functional differences between wrinkled and smooth pea proteins and starches.
To determine means to enhance efficiency for the wet extraction of proteins and starches from wrinkled or smooth peas.
To develop wet isolated protein and starch ingredients from wrinkle peas.

ADF Funding: $115,000

Organization: Saskatchewan Food Industry Development Centre

Contact: Dr. Ricky Lam, (306) 964-8701

Characterization of Pea Lines with Improved Nitrogen Fixation and High Grain Yield (20180146)

To assess the potential of an LCO product on pea lines with diverse nodulation traits.
To evaluate pea lines for nitrogen fixation traits with the broader goal to breed for improved nitrogen fixation in pea.
To assess the potential of selected lines as cover crops.
To assess nodulation traits in selected lines with or without nodulation enhancing treatment.

ADF Funding: $269,500

Organization: University of Saskatchewan

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

Improving Iron Status Increases the Value of Pea in Whole Food and Protein Markets (20180149)

To evaluate the agronomic performance of 20 biofortified pea lines in field trials over multiple years and locations.
To compare a sub-set of the 20 biofortified lines as whole grain flour and as protein isolates to control pea.
To compare biofortified pea to regular pea consumption on iron status and exercise performance in endurance-trained women.

ADF Funding: $298,100

Organization: University of Saskatchewan

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

Understanding the Impact of Particle Size on Physicochemical Properties and Nutritional Benefits of Pulse and Oat Flours (20180182)

To examine the relationships between flour particle size and postprandial glycemia in humans.
To examine the chemical compositions and functional properties of the flours with variations in particle size.
To prepare pea, lentil and oat flours of coarse, granular and fine particle sizes.
To determine the performance, starch digestibility and dietary fiber contents of the obtained flours and resultant foods.

ADF Funding: $282,568

Prairie Oat Growers Association: $25,587

Organization: University of Saskatchewan

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

Introgression of Novel Traits from Wild Chickpea to Improve Adaptation and Yield of Cultivated Chickpea under Suboptimal Environments (20180215)

Evaluate the interspecific populations for yield potential, agronomic and developmental traits across a range of suboptimal environments.
Identify the physiological and morphological traits associated with improved adaptation to suboptimal environments.
Identify chromosomal regions and candidate genes introduced from *C. reticulatum* for improved adaptation to suboptimal environments.
Investigate association between the candidate genes and phenotypic traits through the association analysis.
Identify single nucleotide polymorphism (SNP) markers for selection of genomic regions conferring improved adaptation to suboptimal environments.

ADF Funding: $433,276

Organization: University of Saskatchewan

Contact: Dr. Bunyamin Tar'an, Crop Development Centre, (306) 966-2130

Improved Management of Pea Aphid and Aphid-Transmitted Viruses in Saskatchewan Pulse Crops (20180234)

To survey Saskatchewan pulse fields for the presence of important aphid vectored Potyviruses.
To describe the symptoms of pea seedborne mosaic virus (PSbMV) in faba bean and evaluate damage in controlled laboratory studies.
To determine the LC50 and efficacy of “soft” and novel insecticidal compounds for control of pea aphid in faba bean and lentil.
Develop nominal & economic thresholds & control methods to control pea aphids, maximize yield & protect aphid predators.

ADF Funding: $101,000

Western Grains Research Foundation: $101,000

Organization: University of Saskatchewan

Contact: Dr. Sean Prager, Plant Sciences, (306) 966-8359

Genetic Improvement of Protein and Seed Quality Traits in Pea (20180240)

To develop pea lines with an improved concentration of sulfur amino acid.
To develop pea lines with reduced off-flavor.

ADF Funding: $275,000

Organization: National Research Council Canada

Contact: Dr. Pankaj Bhowmik, (306) 975-5566

Evaluation of Genetic Diversity for Glycemic Index in Pea Flour (20180258)

To determine the variation in starch digestion rate in a pea genome-wide association study (GWAS) panel.
To develop DNA markers associated with low glycemic index in pea.
To evaluate pea varieties contrasting most widely in starch digestion rate to determine the potential related mechanisms.
To determine glycemic index in humans consuming pea varieties contrasting in starch digestion rate.

ADF Funding: $294,800

Organization: University of Saskatchewan

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

Iron Fortified Canadian Lentil Dal for Bangladesh – A Human Efficacy Trial (20180296)

Obtain scientifically relevant, ethically approved and medically acceptable Fe status data for 1,200 young women.
Use these data to support the publications arising from the world's first human study with Fe-fortified lentil dal from Canada.
Develop a long-term plan for production and distribution of fortified lentil dal.
Develop a plan to publicize the results.

ADF Funding: $150,000

Organization: University of Saskatchewan

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

Identification of molecular markers for the introgression of aphanomyces root rot from* Lens orientalis *into cultivated lentil (20180317)

Assessment of aphanomyces root rot resistance in an intraspecific *Lens orientalis* population.
Mapping of quantitative trait loci (QTLs) associated with aphanomyces root rot resistance.
Development of QTL markers and their validation to confirm their stability and effectiveness in different genetic backgrounds.

ADF Funding: $322,550

Organization: University of Saskatchewan

Contact: Dr. Sabine Banniza, Crop Development Centre, (306) 966-4959

Improving Efficiency of a Novel Protein Extraction Technology for Pulses (20180320)

To determine the economic potential of a novel protein extraction process.
To develop a preliminary framework for counter-current process simulation modeling.
To evaluate and optimize the concept of counter-current washing as a method to produce solubilized protein from pulses.
To develop a novel process to increase efficiency of protein extraction from pulses.

ADF Funding: $109,000

Organization: Prairie Agricultural Machinery Institute - PAMI

Contact: Mr. Arnie Harrison, (306) 682-5033

Pea Protein "Omics Determination (P-POD)" (20180436)

This project will undertake novel work to enhance the protein content and the amino acid profile of smooth yellow pea.
Project outcomes will include:
1) one or more varieties of yellow pea with protein concentration at 26 per cent (increasing from the current average of 23 per cent).
2) improved amino acid profile of yellow pea.
3) the development of genomic tools to facilitate the rapid evaluation of genetic material from study populations and the subsequent inclusion of beneficial traits within a breeding program.

SRI Funding: $2,475,214

Organization: University of Saskatchewan

Contact: Dr. Tom Warkentin, Crop Development Centre, (306) 966-2371 and Dr. Bunyamin Tar'an, Crop Development Centre, (306) 966-2130

Alternative Crops

Determination of Ideal Seeding Date for Quinoa (20180231)

Determine ideal seeding rate for quinoa production.
Determine ideal seeding date range for quinoa production.
Determine ideal seeding depth for quinoa.

ADF Funding: $120,050

Organization: Northern Quinoa Production Corporation

Contact: Mr. Derek Flad, (306) 514-3698

Hemp Protein and Oil Powders for Food and Functional Food Use (20180232)

Hemp protein production as a food and health food ingredient and use as a carrier for commercial scale oil encapsulation.
Generation of oil powders by incorporating other oils and functional ingredients into the hemp protein-oil matrix.
Stability testing of the products made with microencapsulated powders.
Market introduction and commercialization of new hemp protein and different oil powders as food ingredients.

ADF Funding: $200,000

Organization: POS Bio-Sciences

Contact: Dr. Anusha Samaranayaka, (306) 978-2836

Value-Added Processing of Canary Seed for Its Protein and Starch (20180290)

Characterization of canary seed flour.
Lab-scale process development for protein and starch fractionation and functionality testing to identify value-added applications.
Scale-up the developed method and comparison of the functionality of the final products with that of lab-scale products.
Evaluating different dehulling and milling techniques for efficient downstream fractionation of canary seed protein and starch.

ADF Funding: $176,000

Organization: University of Saskatchewan

Contact: Dr. Michael Nickerson, Food And Bioproduct Sciences, (306) 966-5030

Miscellaneous Crops Related

Improving Weed Management for Saskatchewan Growers (20180028)

The objective of this project is to assist in the maintenance of a weed science research program in the Plant Sciences Department at the University of Saskatchewan.

ADF Funding: $219,507

Western Grains Research Foundation: $219,507

Organization: University of Saskatchewan

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

Intercropping of Pulse and Oilseeds to Enhance Nutrient Use Efficiency and Nitrogen Fixation (20180064)

To determine how chickpea-flax and pea-mustard intercropping can be used to improve soil nutrient use efficiency i

ADF Funding: $47,410

Western Grains Research Foundation: $47,410

Organization: University of Saskatchewan

Contact: Dr. Jeff Schoenau, Soil Science, (306) 966-6844

Balancing Agronomic and Environmental Outcomes Using Enhanced Efficiency Nitrogen Fertilizers (20180193)

Quantify the influence of enhanced efficiency nitrogen fertilizers on crop nitrogen use efficiency, yield, and N_2O emissions.
Quantify and compare crop N uptake, nitrogen use efficiency, yield, and oil content of canola following fall and spring applications of two enhanced efficiency nitrogen fertilizers (EENFs) or conventional (untreated) urea.
Quantify and compare N_2O emissions from fall vs. spring applications of two enhanced efficiency nitrogen fertilizers (EENFs) with those associated with application of conventional (untreated) urea.
Calculate yield-scaled N_2O emission factors for each fertilizer type and application timing to determine the combination that yields the best balance of agronomic and environmental outcomes.

ADF Funding: $151,067

Saskatchewan Canola Development Commission: $50,371

Organization: University of Saskatchewan

Contact: Dr. Richard Farrell, Soil Science, (306) 966-2772

Extending the Seasonal Photosynthetic Period to Minimize Cropping System Greenhouse Gas Intensity (20180237)

Assess the greenhouse gas mitigation potential of extending the photosynthetic period of cash crop sequences with winter wheat.
Compare N_2O emissions from fall-seeded wheat-canola compared to spring-seeded wheat - canola sequences.
Assess the greenhouse gas balance of crop sequences that combine winter wheat with a fall seeded cover crop.

ADF Funding: $197,670

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Reynald Lemke, (306) 385-9444

Priming Plant Defense: A Broad Spectrum Defense Response that Protects Crops That Have No Genetic Resistance or Effective Chemicical Resistance (20180322)

Assessment of ascr#18 (namatode pheromone), a natural product, for priming defenses of pulse crops against Ascochyta blight and Aphanomyces root rot.
Protecting wheat against Fusarium head blight (FHB) disease by priming wheat defense using ascr#18.
Validation of priming under the field conditions.
Durability of priming signals.

ADF Funding: $190,000

Western Grains Research Foundation: $95,000

Saskatchewan Wheat Development Commission: $95,000

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Hossein Borhan, Molecular Genetics, (306) 385-9411