

## 2018 ICDC Research and Development

Garry Hnatowich, PAg, ICDC

The following Table highlights the titles of projects conducted by ICDC during this year's growing season. The field program was both diverse in term of cropping options (cereals, pulses, vegetables, etc.) and in focus (variety evaluation vs agronomy). The program's size has outgrown the land allocation we have at CSIDC and the 12 acres of town land adjacent to CSIDC we rent long-term from the Town of Outlook. We are indebted to Mr. Roger Pederson for allowing us to rent 40 acres of his land in order to achieve our objectives.

From the project titles an idea of the project's purpose or intent can be formulated. However the importance of each lies in the details. The results of the entire program will be made available

in the upcoming *2018 Annual Research and Demonstration* report and many of the projects will be individually reviewed at the 23rd Annual Saskatchewan Irrigation Conference, Dec. 4-5 2018 in Moose Jaw. Research results will also be shared at other ICDC sponsored meetings or at events such as the Annual AgriARM Research Update (during the Crop Production Show) or through fact sheets.

Not seeing a project title you'd like to see? If you have ideas of projects you'd like ICDC to investigate, or faced cropping challenges you'd like an answer for, feel free to let us know. This is your program. Your guidance and suggestions are always welcomed. Contact me at [garry.icdc@sasktel.net](mailto:garry.icdc@sasktel.net) or at 306-361-6231.

Pulses	
Pea Regional Variety Trial	Dry Bean Regional Trial
Demonstration of Narrow vs. Wide Row Dry Bean Production	Irrigated Bean Variety Trial - Narrow Row (IBVTNR)
Control of glyphosate resistant canola in glyphosate resistant soybean	Irrigated Bean Variety Trial - Wide Row (IBVTWR)
Conventional Soybean Variety Trial	Irrigated Lentil Production
Soybean Regional Variety Trial	Dry bean row spacing demo
Demonstration of Heads Up for sclerotinia control in dry bean	Use of yellow clover and tillage radish on heavy textured high sodium irrigated soils

Specialty	
Demonstration of Conventional Hemp as an Irrigated Crop	Nitrogen response demonstration for Irrigated Quinoa

Oilseeds	
Canola Performance Trial	Sunflower Hybrid Trial
Contans Control of Sclerotinia for Irrigated Canola	Demonstrating 4R N Management Principles for Canola (18-19)
ICDC Irrigated Canola Variety Trial	4R Fall Nitrogen Application for Irrigated Canola (18-19)
An economic approach to stand establishment in canola	Saskatchewan Variety Performance Group Regional Flax Trials
Demonstration of New Early Season Sunflower Hybrid	Demonstrating 4R Nitrogen Principles in Canola (17-18)

*continued on page 2*

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Box 1460, 901 McKenzie Street South  
Outlook, SK S0L 2N0

### Irrigation Conference and AGM

All irrigators are encouraged to attend the Annual Irrigation Conference and AGM.

December 4 & 5, 2018  
in Moose Jaw, SK

To register:  
(306) 796-4727

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Cereals	
ICDC Irrigated Wheat Variety Trial	Soft White Spring Wheat Coop Trial
Saskatchewan Variety Performance Group Regional Wheat Trials - CWRS Wheat	Saskatchewan Variety Performance Group Regional Wheat Trials – High Yielding Spring Wheats
Saskatchewan Variety Performance Group Regional Durum Trial	Saskatchewan Variety Performance Group Regional Barley Trials
Saskatchewan Variety Performance Group Regional Oat Trial	Improving Fusarium Head Blight Management in Durum Wheat in SK
Increasing Wheat Protein with a Post Emergent Applications of UAN	Demonstrating 4R Nitrogen management Principles in Spring Wheat (18-19)
Demonstration of Nitrogen Rate Responses of Irrigated Conventional and Hybrid Fall Rye	Demonstration of Fall Rye as an Irrigated Crop
Production practices of successful spring wheat production	Input Contributions to Spring Wheat Yield Components, Grain Quality and Profits
Specialized N Efficiency Products for Irrigation Cropping System	Demo of Nitrogen Rate Responses or Irrigated Conventional and Hybrid Fall Rye (18-19)
Winter Wheat Response to Contrasting Placement/Timing Options for N Fertilizer(18-19)	Winter Wheat Variety Evaluation for Irrigation vs. Dry Land Production (18-19)

Horticulture	
Demonstration of Baby Carrot Varieties	Haskap Fertilizer and Irrigation Management under Photo-selective Netting
Garlic Cultivar Demonstration	Effect of Apogee (Prohexadione calcium) on Raspberry, Strawberry, Saskatoon berry, and Sour Cherry
Comparison of drip versus overhead irrigation for crops susceptible to fungal diseases	Demonstration of Advanced University of Saskatchewan Dwarfing Apple and Pear Rootstock Selections
Comparison of the Effectiveness of Drip versus Overhead Irrigation	

Forage	
AC Saltlander Green Wheatgrass Saline Tolerance Study	Malt vs Feed Barley Management
Corn Variety Demonstration for Grain Production	Corn Variety for Silage Demonstration
Double Cropping Irrigated Winter Cereals for Silage (18-19)	Defining Agronomic Practices for Forage Corn Production in SK

To view ICDC's Annual *Research and Demonstration Reports* visit: <http://irrigationsaskatchewan.com/icdc/publications/annual-program-report/>

The 2018 *Research and Demonstration Report* will be available March 2019.



## Earlier Seeding of Irrigated Cereals

Gary Kruger, PAG, CCA, Ministry of Agriculture

The center at Outlook conducted research with seeding dates for a wide range of crops during the 1990's. Not all crops can be seeded earlier but if growers could start on their fields even two days earlier, the region would benefit from higher grain yields. Farmers generally focus on pulse crops and canola during the early portion of the seeding window. Much of this inclination may derive from the perceived risk of late post seeding frost injury to the crop and the relative tolerance of each crop to this potential frost event. Trials conducted between 1989 and 1992 at the center with several varieties of spring wheat, durum and barley showed an average yield increase of 21% for the May 1-10 window as compared to the May 24-28 window. A comparison of four spring wheat varieties averaged 23% higher yields with the early planting window. The three durum varieties evaluated averaged 26% higher grain yields. Three barley

varieties showed an advantage of 21% for the earlier seeding window. As we search for management practices that will improve our spring cereal yields, a simple beneficial practice may be to focus on seeding the cereals earlier than we currently do.

Watch for information on the upcoming workshops in 2019:

- Silage Corn Workshop—From Seeding to Feeding
- Variable Rate Irrigation Workshop—Irrigation scheduling-methods for Managing zones
- Irrigation Development—Process and Programs

## “Think you understand center pivot safety and maintenance — Really?”<sup>1</sup>

**Gary Kruger, PAg, CCA, Ministry of Agriculture**

An irrigation conference this past winter discussed the importance of pivot safety and how maintenance practices contribute to a pivot's performance and reliability. Center pivot irrigation equipment manufacturers have developed versatile irrigation equipment which when installed correctly by qualified dealers, provide service well beyond their 15 year designed life span. In this presentation, Marek and Porter (2018) report on studies of center-pivot irrigation systems. These studies indicate electrical hazards due to improper wiring or inadequate grounding are common.

A survey of electrically driven center pivot systems with electric pump motors showed 37% were potentially hazardous because of the lack of a grounding conductor, and nearly 40% did not have a grounding rod installed. More than 50 % lacked a fuse or a means of disconnection. Other hazardous situations were found, including loose connections, improper circuit and motor protection, and deteriorated insulation. Inspections by a state electrical inspector reported similar results. “Of 77 systems inspected at the owners' requests, 10 were classified as lethal; 38

were definitely hazardous; and the remaining 29 were potentially hazardous. The 10 lethal systems had current flowing to ground at the time of the inspection or had almost killed someone shortly before the inspection. The National Electrical Code (NEC) had been violated in all 77 installations.”

The Irrigation Crop Diversification Corporation has developed an annual checklist for pivot maintenance to assist with this important process. The checklist is available on the ICDC website at <http://irrigationsaskatchewan.com/icdc/wp-content/uploads/2017/10/Irrigation-Pivot-Annual-Service.pdf>. Avail yourself of this valuable resource to safety proof the maintenance program for your irrigation equipment.

<sup>1</sup> Marek, T. and Porter, D. 2018. “Think you understand center pivot safety and maintenance – really?” Proceedings of 30th Annual Central Plains Irrigation Conference, Feb 20-21, 2018. Colby Kansas.

## 2018 Irrigated Wheat Production Survey

**Joel Peru, PAg, CCA Ministry of Agriculture**

Wheat generally makes up 25 to 30% of the irrigated crop mix in Saskatchewan mostly due to being an important part of a good agronomic crop rotation. Compared to crops such as dry bean, potatoes and canola, wheat trails behind in net return (see ICDC *Agronomics and Economics* publication). It is increasingly important for irrigators to maximize economic returns on their crops due to the rising costs associated with irrigation. In order to help determine how to make wheat more profitable under irrigated conditions, ICDC conducted a survey in the Lake Diefenbaker Area for the 2018 growing season. This survey was based off the Maximum Economic Yields Demonstration from 1992 for the Outlook Irrigation Production Club.

The survey included 15 irrigated fields with 15 different cooperators. Five fields were selected in SSRID, 5 from Riverhurst, 3 from Luck Lake, 1 from Macrorie, and an independent project south of Lake Diefenbaker. The concept behind the survey was to track and compare the practices of these individual producers to figure out who is achieving the highest yields and why. Cooperators were asked to fill out a survey containing questions on their fertility, pesticide, crop rotation, variety selection and other agronomic parameters that could effect their yield. Rain gauges were set up under all pivots involved in this survey along with the dryland corners to evaluate watering practices. Computer based models from the Alberta Irrigation Management Model (AIMM) were produced for all fields.

This data will help provide irrigators with local information on what practices are generating the highest yields and quality. The yields collected from this survey so far have shown that 2018 was a great year for producing wheat. Crops enjoyed low disease pressure from the sunny dry conditions and the ability to add water as needed allowed crops to reach exceptional yields. ICDC gives a recommendation target yield for wheat and durum at 80 bu/acre and 90 bu/acre respectively. Fields from this survey have yielded as high as 103 bu/acre for hard red spring wheat and up to 110 bu/acre in durum fields.

The agronomy unit with the Crops and Irrigation Branch of the Ministry of Agriculture will be comparing the fields in the survey to each other. This data should prove to be valuable to help determine what the best management practices are for maximizing yields and economic returns.

Once all the survey data is collected and processed, ICDC and Ministry of Agriculture staff will be presenting its findings at the annual SIPA/ICDC conference in Moose Jaw this December. A report will be available in the 2018 ICDC Annual R&D Report which is available on ICDC's website or in physical form at CSIDC or the Ministry of Agriculture Outlook office.

## ICDC Horticulture Program

Cara Drury, PAg, Ministry of Agriculture

2018 has marked another successful year for ICDC's horticulture program. The program continues to succeed from a strong partnership with the Saskatchewan Fruit Growers' and Saskatchewan Vegetable Growers' Associations; as well as support from the Ministry of Agriculture's Provincial Fruit Specialist (Forrest Scharf) and Provincial Vegetable Specialist (Connie Achtymichuk). New inclusions to the horticulture program this year include Dr. Kate Congreves from the U of S, who has been advising on two of this year's larger vegetable projects and Angela Stoppler, acting Horticulture Technician for ICDC. Those noted above, with the help from ICDC summer students, CSIDC and Ministry staff have completed seven different horticulture projects on ten different high value produce crops.

The ICDC horticulture program is focused on identifying production opportunities and best management practices for Saskatchewan fruit and vegetable growers. This year the projects included variety trials of garlic, cucumbers, baby carrots, dwarf sour cherries, strawberries and raspberries. Other projects looked at the use of new technologies like Apogee®, a vegetative growth

retardant on fruit crops; as well as, the continuation of the photoselective netting trial. Comparison of common production practices also took place, looking at trickle versus overhead (center pivot) irrigation, for the production of broccoli, carrots, cucumbers and beans.



Overhead irrigation



Garlic Variety Trial

The results of the horticulture projects will be published in the 2018 ICDC *Research and Demonstration Report*, which will be available from the Ministry of Agriculture or online at the ICDC website, under the publications tab, at <http://irrigationsaskatchewan.com/icdc/>. The projects are also presented at the 2018 SIPA/ICDC conference in Moose Jaw, December 4th. Existing producers or individuals interested in taking advantage of growing high value crops under irrigation can contact the Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture for advice and assistance. For more information or suggestions for next year's program, contact Cara Drury at [cara.drury@mail.gov.sk](mailto:cara.drury@mail.gov.sk) or (306) 867-5517.

## Managing Boron Application for Irrigated Rotations

Gary Kruger, PAg, CCA, Ministry of Agriculture

Boron application to canola has been tested in Saskatchewan extensively over the past twenty years, but researchers have struggled to document yield responses with this practice. Soil testing has also struggled to assist with the decision making process. Irrigation water is a supplemental source of boron to the soil system. South Saskatchewan River water contains 0.2 ppm B. An allocation of 12 inches of irrigation water during a single season would deliver only 1/20th lb boron per acre. Conventional thought suggests that this supplemental boron to the soil more than makes up for the additional removal of boron by the crop through increased yield from irrigation. This quantity, although small for a nutrient, is still significant especially for a mi-

cronutrient like boron which is required by plants in sub-pound quantities.

Fertilizer applications to deficient soils range from 0.5 to 1 lb/ac. Brassica crops typically remove between one-third and one-half pound boron from the soil during their growth of which about one half is removed with the seed at harvest. Unreplicated field demonstrations conducted by ICDC, has demonstrated yield increases between 4-6 bu/ac at 2 of 3 different sites in 2016. This was during an extremely wet year when irrigation water was limited to 2-4 inches over the growing season, resulting in less boron applied by irrigation water than would be normal.

*continued on page 5*



## Managing Boron Application for Irrigated Rotations *continued from page 4*

During the subsequent relatively dry growing season, responses to boron were half as large. Growers are cautioned against applying boron to every canola crop they grow because of the possibility of toxic accumulations of boron in the soil. This is a significant risk for two reasons; 1) cereals in the crop rotation show less tolerance to excess boron in the soil than canola, and 2) drier years encourage capillary rise of moisture from depth and bring salts (sulphates and boron) higher in the soil profile making them more available to the crop.

To avoid the risk of toxicity, apply boron to canola only every 4-5 years in a crop rotation if needed. Another option is to apply boron to every other canola crop in the irrigated rotation. The cost of this practice is under \$10/ac but could easily generate more than double that in gross return without any additional field operations. The most practical method of application is to include boron with the first application of fungicide to canola at early flowering. This will ensure adequate boron for all crops in the cropping sequence without risking toxicity.

## Outlook Crop Walks

Joel Peru, PAg, CCA Ministry of Agriculture

If you have been following ICDC's Twitter feed, you have probably noticed some live streaming this year. The Ministry of Agriculture along with ICDC have been posting virtual field days, also known as "Crop Walks" on ICDC's twitter and Saskatchewan Agriculture's Facebook page. These videos focus primarily on ICDC's work as well as other irrigated crop production related topics. The idea has evolved from Kaeley Kindrachuk, Outlook's Regional Crop Extension Specialist's idea to have producers participate in bi-weekly crop walks. After trial and error, she found that using social media has a much greater audience uptake than physical crop walks. These videos typically reach 200-300 views with the most popular ones reaching in the thousands. Twitter and Facebook are free and readily available resources that allowed ICDC and Saskatchewan Agriculture Specialists to reach more people than ever before.

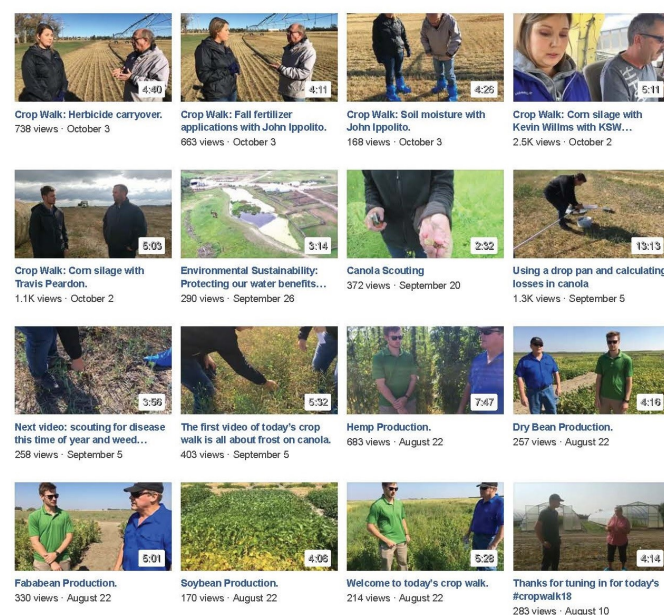


Crop walks were shot using smart phones and streamed through both Facebook Live and Twitter.

Videos of all crop walks which occurred this year are available to view on Saskatchewan Agriculture's Facebook page. Simply go to their page and click the videos tab on the left hand side and you will be able to select any video you choose. Also follow ICDC

on twitter @ICDC\_SK. See below for a list of 2018's Crop walks and stay tuned for 2019's program.

- June 27- ICDC Fruit Demonstration Program with Forrest Scharf
- July 13- Plant Diseases with Barb Ziesman
- July 25- Crop Diagnostic School
- August 10- ICDC Vegetable Demonstration Program with Connie Achtymichuk
- August 22- Specialty Crops with Dale Risula
- September 5- Canola Harvest with Shawn Senko
- October 2- Irrigated Corn Silage with Travis Peardon and Kevin Willms
- October 3- Fall Agronomics with John Ippolito



All videos from this year's Crop walk are available on the Ministries' Facebook page under the "Videos" tab.

# Funding for Irrigation Development

## Canadian Agricultural Partnership (CAP)

Randy Holmlund, Senior Irrigation Technologist, Ministry of Agriculture

Under the Irrigation Program of the Environmental Sustainability and Climate Change component established under Canadian Agricultural Partnership (CAP), irrigators can now access funding to expand irrigated acres (minimum 10 acres) and improve efficiencies in irrigation systems for licensed projects.

### Irrigation Development Program

The Irrigation Development Program supports infrastructure development to increase irrigation capacity by creating a secure water supply to the edge of irrigable land parcels. Eligible items include infrastructure such as; pumps, screens, pipelines, power installation and turnouts. Land parcel irrigation equipment (irrigation pivots) is NOT eligible. Funding is the lesser of 67 per cent of eligible costs or \$1,320 per irrigable acre developed to a maximum rebate of \$300,000. Projects MUST be completed, including obtaining all necessary permits and approvals, by November 30th, 2022.

Given the number of approvals required to develop agricultural land for irrigation (six months to a year), it is recommended that you apply to the Crops and Irrigation Branch for a Request for Technical assistance application as early as possible to meet CAP project completion timelines.



The Canadian Agricultural Partnership (CAP) program is a valuable funding resource to all Irrigators. The Ministry of Agriculture will present more details at the Irrigation Conference in Moose Jaw on December 4 & 5, 2018. Private Irrigators and Irrigation Districts will also inform Irrigators on how they have utilized the program and what processes are required if you are within an

### Irrigation Environmental Efficiency Program

The Irrigation Environmental Efficiency Program supports improved energy and water efficiencies in existing licensed irrigation systems. Eligible items include purchase and installation of a new low pressure centre pivot or low pressure linear system when converting from gravity or side wheel irrigation systems, materials and installation of low pressure, high efficiency sprinkler, replacement of worn out nozzles on existing low pressure systems and improving intake systems. Funding is 30 percent of eligible costs to a maximum program payment of \$50,000.

All applicants must have a pre-site inspection completed before starting their project and an inspection may be conducted when the project is completed.

### For More Information:

Web page: <http://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/canadian-agricultural-partnership-cap/environmental-sustainability-and-climate-change/irrigation-program>

Ministry of Agriculture  
Crops and Irrigation Branch – (306) 867-5500

Irrigation District.

To register for the Irrigation Conference call SIPA at: (306) 796-4727.

Details about the conference can be found on the Irrigation Saskatchewan website: <http://irrigationsaskatchewan.com/>

### ICDC Staff:

Garry Hnatowich, PAg, ICDC Research Director, (306) 867-5405, **Specialty Areas:** Variety testing and Agronomy

Damian Lee, Field Crop Technician, (306) 867-2101

Brenda Joyes, ICDC Executive Administrator, (306) 867-5669

### Ministry of Agriculture Crops and Irrigation Branch Staff:

Kelly Farden PAg, Manager-Agronomy Services, Crops and Irrigation Branch, (306) 867 5528, **Specialty Area:** ICDC program and administration

Gary Kruger, PAg, CCA, Provincial Irrigation Agrologist, (306) 867-5524, **Specialty Areas:** South West Program, Forage Crops, Soil Fertility, Agronomy

Cara Drury, PAg, Provincial Irrigation Agrologist, (306) 867-5517, **Specialty Areas:** Horticulture Crops, Soils

Joel Peru, PAg, CCA, Provincial Irrigation Agrologist, (306) 860-7201, **Specialty Areas:** Specialty Crops, Field Crop Agronomy, Production Economics