THE IRRIGATOR

March 2023

Research Director's Corner

Gursahib Singh, Research Director
Irrigation Crop Diversification Corporation

IRRIGATION PAID OFF

2022! YET ANOTHER YEAR OF DROUGHT, but I am pleased to inform you that irrigation helped complete another year of the thriving research program at Irrigation Crop Diversification Corporation.

Once again, I use this forum as an opportunity to review the past year and update ICDC members on the changes, challenges and opportunities for your organization. We finally finished a successful first year of research programs on the newly leased land (Hnatowich Field) from the Town of Outlook. It was another extensive and diverse field crop research program with 26 field crops on the station and approximately 65 individual trials or demonstrations being conducted. Varietal evaluation continued to be our primary effort, but we also explored the possibility of new crops under irrigation like lupin, mung bean, cowpea, camelina and fenugreek. Some might be aware that the prairie-wide Canola performance trail was terminated following the 2022 harvest. ICDC staff is aware of the importance of this information and has already discussed with SaskCanola to formulate a plan for 2023. CSIDC finally opened its door to visitors in June of 2022; ICDC and Ministry of Agriculture staff organized multiple field tours - including the first in-person ICDC field day after COVID-19. We also participated in numerous extension events in 2022, including the Crop Production Show, Ag in Motion and finally, it was nice to see our members at the Irrigation Saskatchewan Conference 2022.

Photo: Arial view of Hnatowich Field 2022

Irrigation Saskatchewan Conference 2022

I would like to congratulate the SIPA staff for organizing another successful conference. I, along with the Ministry of Agriculture staff, Outlook Regional office, had the opportunity to present at the Irrigation Conference the highlights of the ICDC research program and the results of some of the projects we completed last year. For those unable to attend, a complete ICDC Research & Demonstration report for 2022 will be available (early spring) on the ICDC website.

"irrigation helped complete another year of the thriving research program at Irrigation Crop Diversification Corporation"

AGM Highlights

ICDC and SIPA jointly hosted their annual AGM at Dakota Dunes Resort Whitecap on December 7, 2022. ICDC welcomed three new directors to the board, who have already been active and have taken over multiple responsibilities.

ICDC 2023-2024 program budget was reviewed by AGM delegates, who approved the levy increase in the future. The 2023 ICDC levy fee was set at $1.15 from $1.00. This is the first increase since 2014 and represents an increase of $0.15/acre.

The past year has been busy for both ICDC and SIPA. The Board of Directors from both groups were engaged in exploring merging into one organization. At the AGM, chairman's of ICDC and SIPA discussed the benefits of joining and asked the membership for their input. I am delighted to report that the irrigators in the audience showed strong support and voted to unite the two organizations. Finally, the new brand was unveiled *Irrigation Saskatchewan*, and the new logo was presented. As we advance, ICDC and SIPA boards have already formulated a steering committee (three directors from each organization) to help us navigate the merger steps and finally transition to one organization.

Irrigation workshop 2023

Feedback from delegates and irrigators at the Irrigation Conference displayed that irrigation scheduling and disease management should be discussed in future ICDC extension events, so I would like to take this opportunity to invite our members to the Irrigation workshop organized in Outlook on March 16 by the Ministry of Ag., AAFC/CSIDC scientists and ICDC staff (more information on page 7).

New Chemistry in Wireworm Control

Cara Drury, PAg, Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture

Wireworms are the long lived (4-11 year) larval stage of click beetles. In the larval stage, they are a destructive pest of all major crops, especially horticulture crops. In recent years wireworm control has become a growing concern in Saskatchewan. The major contributing factor to this concern has been the deregistration of lindane-based seed treatments in 2005. Lindane treatment on both cereal crops and oils seeds was an effective insecticide for killing the pest. Neonicotinoid treatments were developed to replace lindane. But these treatments only temporarily stunned or repelled the wireworms. This allowed for a buildup of wireworm populations in the soil.

Photo credit: Dr. Doug Waterer

A newly developed insecticide, broflanilide (IRAC Group 30) has demonstrated exceptional efficacy against wireworms. Research into this product found that broflanilide can provide levels of seed protection that is equivalent to the best neonic products. This insecticide also kills wireworms as effectively as lindane and at far lower doses than either the neonics or lindane.

Broflanilide is marketed by BASF as Teraxxa F4. In Canada this insecticide was approved for use as a seed treatment on cereal crops and as an in-furrow spray treatment. It can be applied at planting time to potatoes and sweet corn (marketed by BASF as Cimegra) as an in-furrow treatment.

"Initial findings have been positive, with all measurements of wireworm damage to the traps being less in the broflanilide treated strips than the untreated strips."

The Strategic Field Program (SFP), **Impact of broflanilide-based seed treatments applied to cereal crops on wireworm populations** is a two-year project taking place at ICDC. The research is in co-operation with the Saskatchewan Vegetable Growers Association and Provincial Vegetable Specialist. The interest of the vegetable industry in this project is garnered from a desire for effective and economical control of wireworm populations. Currently there is not a wireworm insecticide registered for vegetable crops. This project is looking at the use of broflanilide treated cereal crops in rotation with vegetable crops. The desired result is for the year of treated cereal crop to reduce the overall wireworm population sufficiently, to grow a vegetable crop the subsequent year with little wireworm damage.

2022 was year one for this two-year trial. The initial year had strip applications of broflanilide treated and non-treated wheat in the same fields. Wireworm bait traps (carrots) were setup equally through both treatments and monitored throughout the growing season. Initial findings have been positive, with all measurements of wireworm damage to the traps being less in the broflanilide treated strips than the untreated strips. Year two will look to repeat this experiment, gather more data and produce a final report in early 2024. For more information of this project or other irrigated horticulture research please contact:

Cara Drury Pag, Irrigation Agrologist, Ministry of Agriculture 306 -867-5517, cara.drury@gov.sk.ca

Barley Underseeded with Ryegrass for Forage Production

Gursahib Singh, Research Director
Irrigation Crop Diversification Corporation

Irrigation occurs on well-drained soils. Consequently, soil textures are light, friable, and therefore subject to erosional loss. Annual forage cereals, after harvest, often leave the soil subject to loss as the season progresses and residue decomposes. Under seeding, an annual barley forage with ryegrass would keep active vegetative growth from cereal forage harvest to the fall of the growing season. A second forage harvest would also benefit, mainly when quality feed is in short supply, such as occurred due to the 2021 drought. Further, such a cropping system allows irrigated producers with livestock ways to maximize irrigation land value returns; a second harvest of ryegrass after obtaining their barley silage harvest would add to the return on investment.

Farmers are already following these practices on their farms by seeding barley at 2.5-3.0 bu/ac, but the proper rate of barley is always a concern. ICDC and the Ministry of Agriculture specialists at the Outlook regional office jointly led an ADOPT study to demonstrate what barley and ryegrass seeding rates should be followed to accomplish the maximum forage yields. A total of five treatments, including monocrop barley, monocrop ryegrass and intercrop barley and ryegrass, were compared.

Nitrogen (N) fertilizer at a rate of 100kg N/ha was applied as a broadcast and incorporated at seeding. Barley was seeded through the sideband opener at 1 to 1.5" depth, and ryegrass was through the seed opener at a depth of 1/8 to 1/2". Phosphorus fertilizer was sideband with the barley seed placement position. For this study, we chose AB Advantage (6-row), a forage barley variety; Jeanne, an Italian ryegrass variety and Common Westerworlds an annual ryegrass variety. Forage was harvested twice, on July 25 (early milk stage) and October 4. We top-dressed an additional 50 kg N/ha after the first cut.

Total yield (combined first and second harvest)

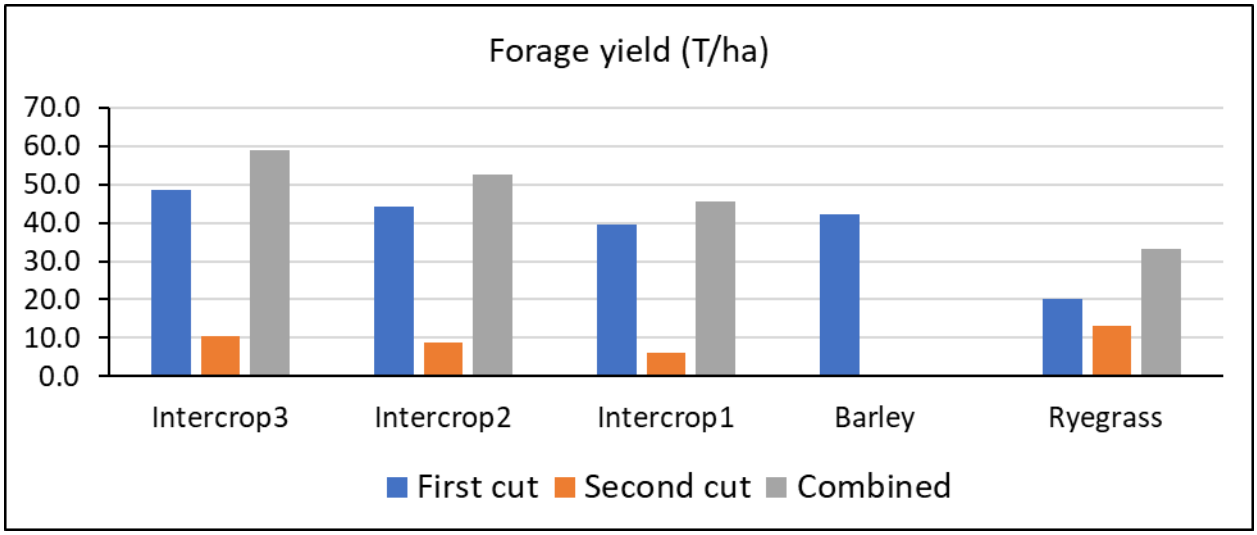
The yield of monocrop ryegrass was 33.4 T/ha, and monocrop barley was 26.5 % higher (42.2 T/ha). Compared to the monocrop ryegrass, the intercrop3 treatment was 77.2% higher yielding, and the intercrop2 treatment was 58.1% higher. Yields of intercrop1 treatment and monocrop barley were similar but higher than monocrop ryegrass

First harvest (July 25)

The yield of monocrop ryegrass was 20.3 T/ha, and monocrop barley was 42.2 T/ha. Compared to the monocrop barley, the intercrop3 treatment was 15.2 % higher yielding, and the intercrop2 treatment was 4.5 % higher. Yield of intercrop1 treatment was lower than monocrop barley.

Detailed treatment list.

Treatment No.	Treatment codes	Crop
1	Barley	Monocrop barley @@ 3.0 bu/ac seed rate
2	Intercrop3	Barley @ 3.0 bu/ac + 5 lb/ac Italian and 5 lb/ac Annual
3	Intercrop2	Barley @ 2.0 bu/ac + 5 lb/ac Italian and 5 lb/ac Annual
4	Intercrop1	Barley @ 1.0 bu/ac + 5 lb/ac Italian and 5 lb/ac Annual
5	Ryegrass	Monocrop 10 lb/ac Italian and 10 lb/ac Annual



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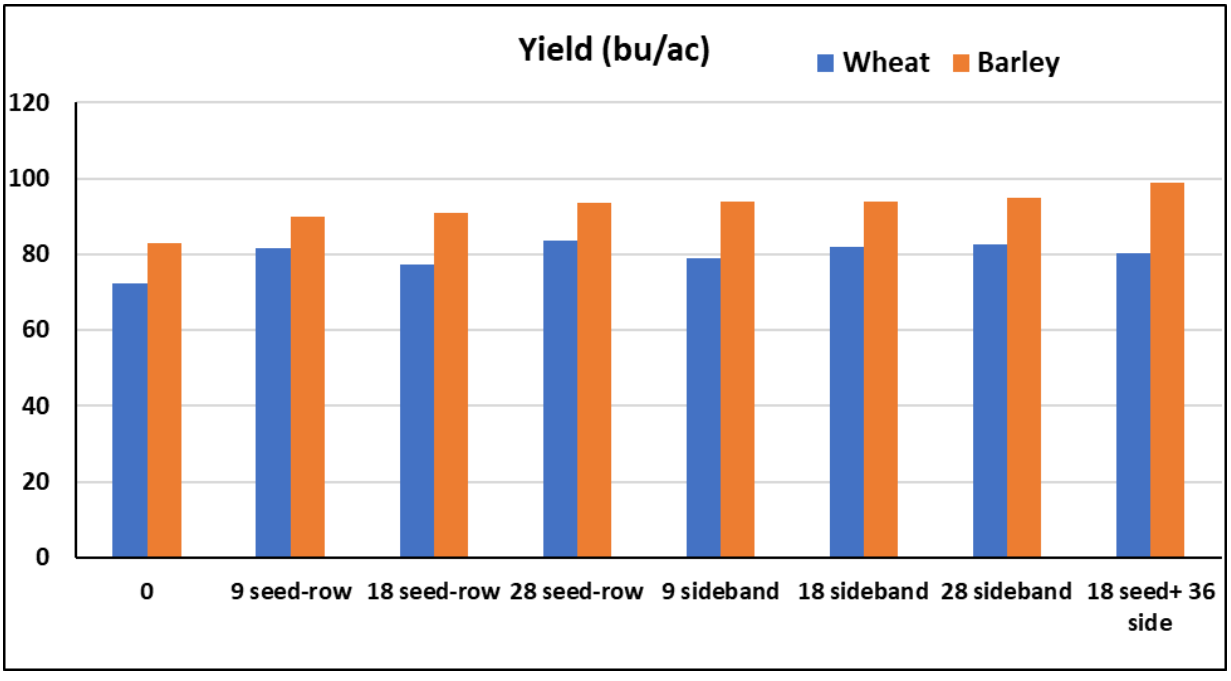
ICDC Research Program Highlights

Gursahib Singh, Research Director
Irrigation Crop Diversification Corporation

In 2022, ICDC continued exploring the response of wheat and barley to Potassium (K) fertilizer, and I am happy to say that we saw a yield response in both wheat and barley in the second year of this study. Potassium is abundant in Saskatchewan soils, and we saw similar levels on our field, with levels in the moderate to high range [322 lb K/ac (161 ppm)]. In this study, K fertilizer was applied to wheat and malt barley at 0, 9, 18 and 28 lb K20/ac (10, 20 & 30 kg K2O/ha). The fertilizer was applied either in a side band position or in the seed row. A final high K fertilizer treatment of 18 lb K/ac seed row + 36 lb K/ac sideband was included. The average wheat and malt barley yield response to all K fertilizer applications was 12.4% and 12.2 %, respectively. Wheat yield response did not change as we increased the rate or switched from seed row to sideband. Malt barley did show increased yield at a higher level of K fertilizer (18 and 28 lb K20/ac), but caution is needed as higher levels of salts associated with the fertilizer can cause seed damage.

With the strong mustard demand and prices in 2022, ICDC partnered with the Ministry of Agriculture, Sask Mustard and Mastard21 to explore the scope of hybrid and composite mustard varieties under irrigation. Newly registered varieties AAC Brown 18 and AAC Yellow 80 are available for producers to grow. Both varieties were seeded on May 21, 2022, at the ICDC Hnatowich field under irrigation at 10 lb/acre seed rates for AAC Brown 18 and 12 lbs/acre. The agronomy package followed for mustard was similar to canola (seeding time, seeding depth, fertilizer rates, disease and insect control) with additional in-season fertigation at the start of flowering (30 lbs/acre N and 20 lbs/acre P liquid fertilizer) to reduce vegetative growth and enhance flowers. Flea beetles love mustard, and plots were sprayed twice in early June; diseases were not an issue as the weather was hot and dry. Both varieties were swathed and harvested in late August. AAC Brown 18 (hybrid mustard) yield was 64.5 bu/acre, and AAC Yellow 80 (composite mustard) was 48.4 bu/acre. Based on November 2, 2022 - Government of Saskatchewan grain prices (AAC Brown 18 at $50/bu and AAC Yellow 80 at $55/bu), the gross revenue for AC Brown 18 was $3225/acre, and AAC Yellow 80 was $2662/acre.

Rick Mitzel (Executive Director Sask Mustard and CEO of Mustard 21) sharing information on mustard varieties at ICDC field day 2022.



Garlic Methods to Assist in the Expansion of the Garlic Industry in Saskatchewan

Sara Ingell, BSc., AAg., Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture

Dr. Doug Waterer carried out a Strategic Field Project (project number 20180419) called Garlic Methods to Assist in the Expansion of the Garlic Industry in Saskatchewan throughout the years of 2019 – 2021.

The intent of the project was to identify best management practices for growing garlic in Saskatchewan. Planting material is expensive as it can cost from $15,000 - $24,000 for the seed to establish a one-acre crop of garlic.

This project had four main objectives that were assessed at the end of each growing season.

1. Garlic varieties to rate their suitability for the fresh market and processing requirements
2. Management techniques to control the size of the garlic bulb
3. Agronomic practices when establishing garlic from the bulbils*
4. Processing quality of garlic rounds versus standard bulbs

The project was carried out at two locations: the Conservation Learning Centre near Prince Albert and the CSIDC research station in Outlook.

Crème de la Rasa and Spanish Roja were the only varieties that performed well. The most widely grown variety of garlic that is grown in Saskatchewan is Music and it performed average throughout the trials. That being said, Music was the variety that stored the best. Krestova, Yugoslavian and Chesnok garlic varieties were considered the highest overall quality in 2019. Crème de la Rasa and Spanish Roja were the only varieties that performed well in 2021. Persian Star, Red Russian, CA-Artichoke and Italian Purple were considered the highest overall quality in 2020. There are no results for 2022 due to herbicide injury.

Yield increase was seen when in-row spacing was reduced to two inches. This also resulted in a smaller size of the harvested bulbs which also fulfills a market need. Planting a bulbil is less labor intensive and less costly compared to planting the cloves The project found that it was possible to plant a bulbil to establish a garlic crop as long weed competition is minimized. After two growing seasons of planting bulbils as starting material, harvesting fully cloved bulbs is achievable. After three months of storage, none of the garlic varieties that were tested were in good condition due to hydration, sprouting and disease.

Establishing good crop management practices is important in garlic production for the producer to generate the maximum yield results as the cost of seed is so expensive. The full report of the project can be found in the 2022 ICDC Research and Demonstration Report.

Figure 1. Spring planted garlic crop at the Outlook test site in mid-July 2019. Note the superior vigor of Krestova (extreme right) relative to the widely grown Music variety. Photo credits to Dr. Doug Waterer.

Barley Underseeded with Ryegrass for Forage Production

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Second harvest (October 4)

The yield of monocrop ryegrass (10 lb/ac Italian and 10 lb/ac Annual) was 13.0 T/ha and higher than all other treatments.

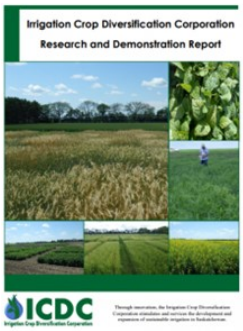
Results presented are from a single year should be tempered; however, forage barley seeded at a higher rate had a yield advantage than other seeding rates tested. We have re-submitted the project proposal to the Ministry of Ag. to continue this field study for the second year and have also included a dryland site (WCA – Swift Current)

Publications Available to Irrigators

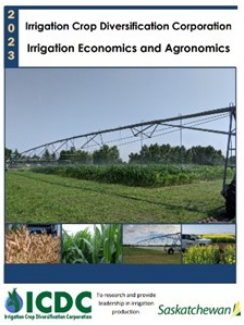
Morgan Coté, AAg, Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture

ICDC creates three publications on an annual basis; the *Research and Demonstration Report*, the *Irrigation Economics and Agronomics* Guide, and the *Crop Varieties for Irrigation* Guide.

There are two new publications for the season, the *Irrigation Scheduling Manual for Saskatchewan* by Agriculture and Agri-Food Canada and the Irrigation Booklet created by the Ministry of Agriculture. The two guides and the irrigation manual are already published for 2023, copies are available at the Ministry of Agriculture office and/or CSIDC research station in Outlook as well as on-line on ICDC's website. The R & D report will be published in early spring and the *Irrigation Booklet* will be published later in the season.

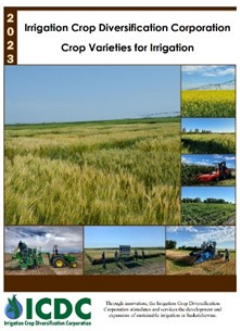


The ICDC *Research and Demonstration Report* provides a description of the research projects that were carried out in the last crop year at ICDC. The research is carried out by Dr. Gursahib Singh and his team with support from the Ministry of Agriculture.



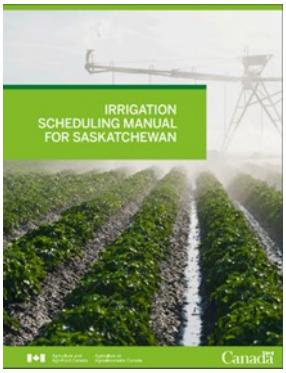
The *Irrigation Economics and Agronomics* publication is a guide to help determine your on-farm cost of production. Irrigators can work through different crop production scenarios to help with cropping decisions for the upcoming year.

There is an interactive calculator when accessed through the ICDC website!



Crop Varieties for Irrigation is a publication that is created in collaboration with ICDC and other commodity groups to assess the performance of common crop varieties under irrigated conditions. Characteristics such as yield, lodging, plant height, and days to maturity are all evaluated for different crops and varieties.

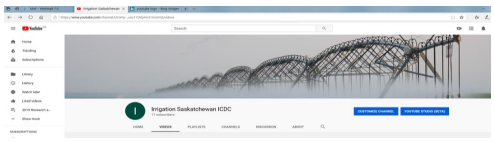
Irrigation scheduling, or irrigation water management, ensures that water is consistently available to the plant and that it is applied according to crop requirements. This manual replaces the province's old scheduling manual as it is more in depth and includes some information on variable rate irrigation management.



The purpose of the *Irrigation Booklet* is to provide a statistical overview of irrigation information and data primarily relating to the irrigation districts situated in Saskatchewan, but also includes information about irrigation across the whole province.

Irrigation Booklet **COMING SOON**

Follow ICDC on social media



YouTube

https://www.youtube.com/@irrigationsaskatchewanicdc9312

ICDC@ICDC_SK

https://irrigationsaskatchewan.com/icdc/

Irrigation Crop Diversification Corp

Irrigation Saskatchewan

Upcoming Events

Follow us on facebook and twitter and on the ICDC website under events for details on upcoming events including:

March 2023

- AgriARM Research Update
- Irrigation Scheduling and Disease Management
- Dry Bean webinar
- Soils and Crops 2023

July/August 2023

- In-field tours and crop walks
- Bean Tour—Riverhurst Bean Festival

December 2023

- Irrigation Conference and ICDC Annual General Meeting

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

Morgan Coté, Provincial Irrigation Agrologist, (306) 860-7201 Specialty Areas: Field and horticulture crops, irrigation scheduling and fertility management

Sara Ingell, **AAg,** Provincial Irrigation Agrologist, (306) 860-6514 Specialty Areas: Agronomy and Irrigation Scheduling

Directors of ICDC

Producer Board Members	**Irrigation District**	**Development Area**	**Term Ends**
Jeff Ewen, Chairperson	Riverhurst	LDDA	2025
David Bagshaw, Vice-chairman	Luck Lake	SWDA	2024
Kaitlyn Gifford	SSRID	LDDA	2023
Matthew Lawless	SSRID	LDDA	2025
Lucas Ringdal	Non-district		2025
Kirsten Oram	LDDA	SSRID	2025
Elmer Palmer	Consul-Nashlyn	SWDA	2024
Murray Purcell	Moonlake	NDA	2023
Appointed Board Members	**Organization**		**Term Ends**
Aaron Gray	Saskatchewan Irrigation Projects Association		December 2023
Kelly Farden	Manager, Agronomy Services, Crops & Irrigation Branch Saskatchewan Ministry of Agriculture		December 2023
Dianna Emperingham	Executive Director, Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture		December 2023

THE IRRIGATOR

March 2023

In this Issue:

The *Irrigator* is a publication released bi-annually by ICDC. It provides Saskatchewan Irrigators with an update on ICDC's activities, project highlights and agronomic information. Providing this information help Saskatchewan Irrigators produce their crops using economical and sustainable practices. Copies are mailed out to our mailing list and are available on ICDC's website.

ICDC's focus is on the research and demonstration needs of Saskatchewan's irrigation farmers. ICDC works to ensure that these needs are met.

ICDC Vision

ICDC will be the primary source of irrigation research and demonstration for irrigation producers in the province of Saskatchewan to maximize profitability and sustainability in the irrigation sector.

ICDC Mission

ICDC conducts irrigation research and ensures knowledge transfer of that research to the irrigation producers of Saskatchewan.

ICDC Objectives

- To research and demonstrate to producers and irrigation districts profitable agronomic practices for irrigated crops.
- To develop or assist in developing varieties of crops suitable for irrigated conditions.
- To provide land, facilities, and technical support to researchers to conduct research into irrigation technology, cropping systems, and soil and water conservation measures under irrigation and to provide information respecting that research to district consumers, irrigation districts and the public.
- To co-operate with the Saskatchewan Ministry of Agriculture to promote and develop sustainable irrigation in Saskatchewan.

ICDC
Irrigation Crop Diversification Corporation

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