

Research Director's Corner

Garry Hnatowich, Research Director
Irrigation Crop Diversification Corporation



It's our Spring Edition of *The Irrigator* so I once again take the opportunity to recap the past year. It's been a busy one and your ICDC staff has certainly been fully engaged.

The 2019 growing season, like most lately, was a challenging one. At Outlook our 2019 weather summary wasn't far off our 30 year average – if we

simply consider the season in its entirety. Therefore, we might expect an average year in terms of crop production, which for some commodities was not the case. Growing season precipitation was 10% lower than historic but the real damage occurred prior to mid-June. In the Lake Diefenbaker region subsoil moisture was poor or less than optimal. Our crop stands in many of our trials were less than our targeted densities due to uneven germination. Secondly, early season temperatures were well below normal during the night and soils slow to warm during the day. This was evident in slow seedling development. As was the case in many commercial fields, once irrigation was applied, we saw a flush of non-germinated seed, and therefore 2, or 3, differing crop stages within the same field. Then came the fall, again with cool and poor drying conditions. Small but frequent splashes of rain were enough to shut down harvest for a day or two, we'd get a day of harvest and then another splash to shut us down. Frustration to say the least. So needless to say this past season's research program was one of both success and failures.

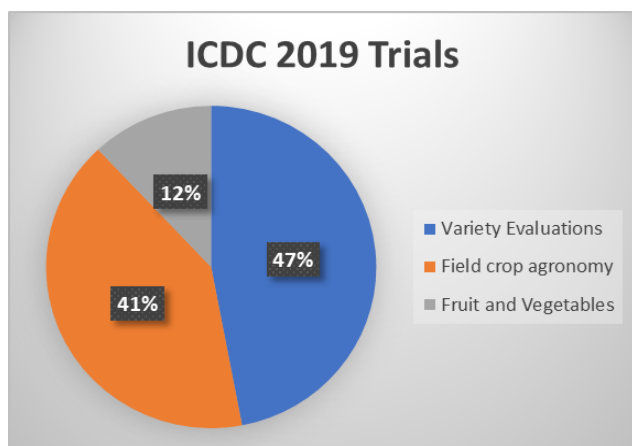
Our successes begin with the number of trials established and the number of grant's received. We seeded better than 60 trials of which approximately 47% involved variety evaluations, 41% were field crop agronomy studies and 12% involved fruit and vegetables. We received grants through the SK Ministry of Agriculture ADF, ADOPT and SFP research funding programs (through the Canada-Saskatchewan Canadian Agricultural Partnership (CAP) bi-lateral agreement), SK Pulse Growers, SK Wheat Development Commission, SK Barley Development Commission, SK Canola Development Commission, Canola Council, SK Forage Council, SK Vegetable Growers Association, SK Fruit Growers Association, SK Variety Performance Group and from two private agri-business organizations. So far in 2020, we have expanded our grants received to additional commodity groups other than those mentioned. Our failures occurred through uneven emergence and/or delayed emergence, storm damage or failure to mature, subsequently we abandoned a number of trials. We still have a flax variety evaluation waiting to be combined!

From an operational and administrative view a great many initiatives have, or are presently, developing. Discussions considering a possible merger between ICDC and SIPA (SK Irrigation Projects Association) have been put aside, from our point of view, as SIPA considers the expectations required from a single organization. As all Irrigation District members know, you've been paying a \$1.00 per irrigated acre levy fee to ICDC as per legislative requirement. Non-district irrigators have had their levy paid for by the SK Ministry of Agriculture (MOA) as ICDC is unaware who these producers might be due to privacy laws. Therefore, since the ICDC membership increased their levy fees to \$1 the MOA has been providing ICDC with \$100K per annum, on the behalf of non-district irrigators. The ICDC Board received a letter from the MOA indicating their desire to discontinue payment of these fees and their wish for ICDC to begin direct collection of levies owed. The MOA is presently exploring ways in which ICDC can identify all non-district irrigators in Saskatchewan. At this point all aspects of the ability to both identify individual irrigators and a levy collection mechanism are evolving. Our hope is that the \$100K we have come to rely on will not immediately disappear but the provinces contribution will decrease at the same rate as ICDC's ability to collect levy funds increase, on a dollar to dollar basis.

Challenges

At present ICDC has been able to build a cash reserve but we are now approaching a transition stage in operations which will quickly draw down, or eliminate, these reserves. Our three main challenges are;

- Land base
- Infrastructure
- Staffing



Research Director's Corner

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Land base remains our first and foremost challenge. At present, ICDC has access to a defined land allotment at CSIDC, this base is certainly appreciated, but insufficient to accommodate our field program's needs. We presently have a long-term lease on an additional 14 acres adjacent to the CSIDC research center. Additionally we annually seek a rental arrangement of another 40 acres of potato stubble (rotationally this allows use to plant oilseeds, cereals and pulses). This is the size of the land base ICDC presently, and foreseeably requires long-term. Finding and acquiring the 40 acre land rental is a challenge and distance from our base can lead to inefficiencies in time and labor. ICDC has been pre-approved for a financial line of credit for both land and equipment purchase. A quarter section purchase will allow us 40 acres to be used annually on a 4 year rotation. In fact, ICDC did attempt to purchase 160 acres within the SSRID however, our bid was unsuccessful. We are presently looking at another land base possibility, and while premature to outline this initiative, suffice to say we are actively searching for ways to acquire land. Regardless, the 160 acres of ground required will come with a hefty cost to our savings and likely require financing.

Infrastructure is our second goal. Should we acquire land there may be a need for capitalization of irrigation infrastructure, either a pivot or linear systems, and all other requirements for water delivery. At present our 5-year occupancy agreement at CSIDC allows us use of Agriculture & Agri-Food Canada (AAFC) equipment, if available. We have identified critical pieces of equipment required for ICDC to be able to act independently from reliance on AAFC equipment. Top of the list was a seeder, therefore with Board approval, we contracted Fabro Industries to build a small plot seeder with enough attachments to meet our needs. This unit (see picture) was delivered Feb. 19, 2020. These units are not inexpensive, but by closely mimicking a seeder previously built by Fabro for AAFC, we saved considerable dollars on design and blueprinting. Still this unit was approximately \$135K. ICDC was very fortunate in being awarded approximately \$15K from the Morris Sebulsky SaskCanola endowment fund to be used in support of this purchase. Additional



Small plot seeder purchased with support by Morris Sebulsky SaskCanola endowment.

equipment will be acquired, and the Board has decided to set aside 25% of any realized annual budget surplus to be set aside for infrastructure build. The Board will also consider purchases

outside budget allocations should quality second-hand equipment come available.

The most valued asset of any organization is its **staff**. In that I am privileged to work with the best. Brenda Joyes is an exceptional administrator and essential in the day-to-day functioning of the entire organization. Damian Lee has become a noteworthy and talented Field Technician, fulfilling his role with independence and accuracy. Our latest staff addition is Mr. Ted Nodge, Ted was raised on his family's farm at Craik, has a Bachelor's Degree in Agriculture from the U of S and as a special bonus is a Journeyperson Machinist. Ted joined us last April and immediately assumed duties that frankly had become overwhelming for me with the growth of the program. Ted is a go-to guy and we fully intend to capitalize on his many talents. A number of years ago the Board developed a strategic plan that included, in part, a succession plan for my replacement. The intent is to have a candidate hired and in place two seasons prior to my retirement. To that end we advertised for potential candidates last fall and recently interviewed short-listed candidates. With Board approval I am pleased to announce that Dr. Erin Karppinen will be joining ICDC April 1st. Dr. Karppinen is presently a Research Biologist at AAFC Swift Current, and completed her Ph.D. at the University of Saskatchewan in the Dept. of Soil Science. Erin is originally from the Outlook region and worked at CSIDC throughout her undergrad years as a summer student. I am fully confident in Erin's ability over the next couple of years to assume the role of Research Director and I look forward to working with her. I believe with the latest hires our program has stabilized in size, and no further permanent staffing required in the foreseeable future. However, to accommodate the growing staff level another vehicle will be required plus an enclosed utility trailer to move materials and supplies from location to location. These have been acquired.

Combined these initiatives are a costly undertaking, however, ICDC is in a strong financial position. The very fact that they can be considered is testimony to the success and growth achieved through dollars raised outside of membership levies. Testament to this is the success ICDC has had this winter with grant applications. We were awarded an ADF grant to evaluate nitrogen fertilizer responses of silage and grain corn, a 3-year project worth > \$169K, co-recipient for a dry bean ADF study with the U of S worth > \$394K (U of S receives the bulk of this amount). We maximized, for the first time ever, our cap eligibility of \$75K in ADOPT funding, and are still awaiting results from a variety of other grant applications. 2020 will again be a busy year with all staff privileged to be working on your behalf.

As always, should you have any thoughts or suggestions for research or demonstrations you'd like to see please feel free to contact me, I'd love to have a discussion.

Garry

Workshop for Irrigated Cropping Alternatives

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ICDC hosted the Irrigated Pulse Workshop on March 5 at the Outlook Heritage Center. The theme was chosen to highlight pulse crops since they are an important part of an agronomic crop rotation. Under irrigation, growing higher value pulse crops carries less risk compared to dryland production and yield targets are much higher with moisture not being a limitation. The meeting brought together Mike Baerwald with Rudy Agro Ltd (wesw@rudyagro.ca), Brad Goudy with Faba Canada Ltd (proactiveproducers@sasktel.net) and Alvin Klassen with Dry Bean World (alvin@drybeanworld.com) to discuss marketing opportunities that could aid increasing pulse cropping in irrigated rotations. Irrigators that are interested in growing smaller acre pulse crops such as dry bean and faba beans appreciated learning about marketing opportunities.

In order to grow a profitable pulse crop, proper agronomic practices are necessary. Diseases such as *Aphanomyces* is a significant threat to irrigated pulses. Michelle Hubbard, pathologist at AAFC in Swift Current discussed disease management for irrigated pulses. The industry needs to increase cropping with tolerant pulse crops so a more diverse and sustainable crop rotation can be developed for the sector. The meeting agenda explored po-

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tential management strategies to combat the disease threat to profitability and possible expansion of processing opportunities with these crops.

When used effectively, irrigation provides benefits and opportunities for pulse production in Saskatchewan. Dale Tomasiewicz, Irrigation Agronomist with Agriculture and Agri-Food Canada, gave an overview of his research focusing on the improvement of irrigation practices for soybean and fababean. Pulse crops continue to be a major focus of ICDC's research. Garry Hnatowich presented on key findings for pulse production from his program.

The presentations will be available on the ICDC website <https://irrigationsaskatchewan.com/icdc> following the event. If you were unable to attend this event and would like to view the presentations, they are available on ICDC's YouTube channel at https://www.youtube.com/channel/UCwhy-_unz11OVpHn31JoUmQ/.

More information can be obtained by calling ICDC at 306-867-5669 or the Saskatchewan Ministry of Agriculture at 306-867-5500.

The Story Behind SK Crop Insurance's Enhanced Irrigation Program

The Saskatchewan Crop Insurance Corporation (SCIC) offers separate insurance coverage for those producers who utilize irrigation in their farming operations.

In 2008, through collaboration with the Saskatchewan Irrigation Projects Association (SIPA), SCIC's Enhanced Irrigation Program began as a pilot allowing separate insurance on dryland and irrigated acres. Production loss is determined by calculating the production for each system (dryland and irrigation) separately to determine whether a crop is in a claim situation.

For example, if a drought occurs and dryland production is reduced while irrigated production is not affected, the dryland loss is not offset by irrigation production. Producers must be able to store their dryland and irrigation production separately for the Enhanced Irrigation Program to work effectively.

When first introduced, the Enhanced Irrigation Program was considered high-cost for federal-provincial cost sharing and producers were required to pay higher premiums. In 2009, recognizing the importance of irrigation as part of the agriculture sector in Saskatchewan, the provincial government provided additional funding for the Enhanced Irrigation Program. This reduced the producer's share of premium costs from 66.7 to 40 per cent, aligning with other Crop Insurance options.

All producers with irrigation and dryland production are encouraged to consider coverage through the Enhanced Irrigation Program. When selecting Crop Insurance coverage, producers need to select the Enhanced Irrigation Program to be enrolled; it is not automatically selected.

If the Enhanced Irrigation Program does not suit a producer's operation, other coverage is available for crops grown on irrigated and dryland land. As irrigated crop production is typically higher than dryland crops, and risk is lessened, coverage is based on individual irrigated production records. The premium rate is reduced to a percentage of the dryland rate.

Producers are reminded the deadline to apply, reinstate, cancel or make changes to Crop Insurance contracts is March 31, 2020. This is also the deadline to select insured crops and coverage levels.

Please contact any of the 21 local SCIC offices across the province or call 1-888-935-0000 to discuss the right insurance package for your farming operation. More information is also available online at www.scic.ca.

The Value of a Dollar

ICDC Board of Directors

The Irrigation Crop Diversification Corporation (ICDC) has been conducting irrigation related research and demonstration projects on behalf of Saskatchewan irrigation farmers since its inception in 1996. Over the last 25 years ICDC has undergone a notable evolution and has experienced substantial growth. In the early days, ICDC operated on a shoestring budget and the research program was delivered primarily by agrologists employed by the provincial government. Today, ICDC has an annual budget that has grown and has a permanent staff of four employees who deliver the majority of the research program.

Most irrigators are aware that it is legislated in *The Irrigation Act, 1996* that they are required to pay ICDC an annual levy on a per irrigated acre basis (currently set at \$1 per acre). To date, only irrigators within irrigation districts have been paying this levy. More recently, the Ministry of Agriculture has indicated to ICDC that it would like them to start collecting the levy from the non-district irrigators as well.



At one dollar per acre the investment may seem relatively small when compared to your overall cost of production, however, every dollar counts and as the acres add up so does your levy. You may then ask yourself the question, “how does this investment provide value to my farm?” This is a fair question and one that we will attempt to answer.

1. ICDC provides unbiased, third party agronomic research. As governments and universities have gradually trended away from conducting applied agronomic research there has been a growing number of input suppliers and retailers that have moved into this realm to help fill the void. These companies generally have professional staff and often conduct quality research but at the end of the day they are in the business of selling you inputs. ICDC on the other hand, is not trying to sell you any products. It has primary mandate to research and demonstrate profitable agronomic practices for irrigated crops. If product “A” does not provide any yield benefit, ICDC will report as such.

2. ICDC conducts variety trials on commonly grown irrigated crops assessing how the latest varieties perform under irrigated conditions. One of the key agronomic decisions that you make every spring is variety selection. Depending on traits such as

“I find great value in the fact that ICDC does research in small plots and then scales it up to do field demonstrations directly with irrigators in their fields. Direct evaluations of products and technologies at the field scale gives me an added level of confidence for making decisions on which inputs and practices will benefit my operation.” Aaron Gray, SIPA Chairman

yield potential, lodging rating, and disease package, certain varieties can perform quite differently under irrigation than they might under dry-land conditions. Variety selection alone is something that can easily impact your return by \$10 to \$30 per acre depending on crop type and market conditions. ICDC publishes the *Crop Varieties for Irrigation* guide on an annual basis and mails it out to all of its members.

“Variety evaluation is something that can’t be widely tested at the farm level. ICDC conducts variety evaluation of all major irrigation crops in the same geography and climatic conditions I farm in. It is hard to put a value on it, but its far more valuable than \$1/ac. Variety information found in the Provincial Variety Guide is an excellent resource, but how each variety performs under irrigation can be vastly different than under dryland conditions.” Jeff Ewen – Irrigator – Riverhurst Irrigation District

3. Right in the name, ICDC explores crop diversification opportunities for new and emerging crops that might have a fit under irrigation. Over the years ICDC has done a large amount of research on crops such as dry beans, corn, soybeans, and numerous others working to refine the agronomics of growing these crops under local conditions. ICDC is learning the expensive lessons so that you don’t have to on your own farms. ICDC also provides an objective economic analysis of growing these crops in its annual *Irrigation Economics and Agronomics* publication. A detailed cost of production is compared against projected returns allowing you to get a better sense of the potential profitability of different cropping options.

4. Producer driven research. ICDC conducts applied research based on the priorities that have been defined by irrigation farmers. If the research isn’t relevant to your farms, ICDC isn’t going to do it. The research priorities of provincial and federal governments tend to have a larger scale, societal focus with an

“Irrigation research funded by the levy helps find crops that you may have thought would never grow here. Find out a production method can be done another way. ICDC has played with crops from around the world to see if they will grow here, especially specialty crops and horticulture. The partnership with CSIDC has allowed them to research corn and soybeans for decades alongside potatoes, beans, carrots, and feed crops.” Anthony Eliason- ICDC Chairman.

Learning from Our Neighbors

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Alberta's 1.7 million irrigated acres, along with significant value added processing, is an aspiration for Saskatchewan's irrigation industry. A primary focus in Saskatchewan's Plan for Growth is expanding irrigation, and there is opportunity to learn from Alberta's industry. In January 2020, 400 attendees participated at the Irrigated Crop Production Update in Lethbridge which focused on topics relevant to our local industry.

The first topic discussed focused on agronomic management of irrigated crops. These familiar topics included 4 R nutrient management, plant growth regulators and fertigation. Len Kryzanowski, with Alberta Agriculture and Forestry, spoke on fertilizer management strategies and an interactive model that can assist irrigators deciding on their fertility practices. The Alberta Farm Fertilizer Information and Recommendation Manager (AFFIRM) allows a producer to select a crop to be grown, identify the field's agro-climatic region, input soil and crop management practices and enter soil test into the model. The model also requires the input and commodity prices to provide economic analysis. If you are interested in learning more about this model and/or would like to download it out go to the following page on Alberta Agriculture and Forestry's website: [https://www1.agric.gov.ab.ca/\\$department/softdown.nsf/main?openform&type=AFFIRM&page=information](https://www1.agric.gov.ab.ca/$department/softdown.nsf/main?openform&type=AFFIRM&page=information)

The next two speakers focused on irrigation technology and how to manage pivot tracks and the irrigation of dryland corners. With irrigated land prices being so high in Alberta, corner arm systems are a very common way to maximize the irrigated area of a field. In comparison, Saskatchewan has very few corner arm systems. As our land prices continue to rise, these systems will become more popular and our neighbors in Alberta are a great resource of information.

The pest management session at this event focused on diseases and insects that we currently deal with in Saskatchewan. With clubroot being such a major issue in Alberta, more methods to detect and monitor this disease are being developed. Mike Harding, with Alberta Agriculture and Forestry, discussed research on the use of trained canines for the detection of clubroot in a field. Trialing showed that canines can be very effective at detecting clubroot spores, even at minimal levels, and can help give producers an early warning before seeing visual symptoms on their crops. These "sniffer dogs" could be the first line of defense in detecting the presence of the disease on equipment (farm or industrial) moving from field to field. Saskatchewan producers and industry are already taking extensive measures to prevent the spread of clubroot and anything new we can learn from Alberta's experience will help keep canola a viable part of our rotations.

The remainder of the conference focused on crop opportunities, research and water management. Hemp was a common theme from two presenters who are optimistic of this crop's future. Hemp's various end uses and emerging markets are expected to strengthen demand. The selling point of this crop is that the entire plant can be marketed for its different components. Hemp crops contain fiber, grain and cannabinoids (i.e. CBD) and consumer's interest are increasing the demand for these products.

Technologies and management methods to increase water use efficiency were also explored. Ministry staff who attended this conference are planning to provide information to Saskatchewan Irrigators on some of these topics including the new version of AIMM and an irrigation scheduling mobile app.

If you would like to discuss the topics from the conference further feel free to contact Joel Peru at joel.peru@gov.sk.ca or (306) 860-7201 or Gary Kruger at gary.kruger@gov.sk.ca or (306) 867-5524.

The Value of a Dollar

increasing tendency to be focused on outcomes related to the environment and climate change. Not that these aren't important priorities, but ICDC's priorities are focused closer to home and what is best for your individual irrigation farms.

5. ICDC membership provides an opportunity to engage with a network of other like-minded irrigation farmers. Irrigation farmers tend to be innovators who are pushing yields, exploring diversification opportunities, and generally trying to capture as much value out of their investment in water as they can. Attending extensions events such as the Annual Irrigation Conference, the CSIDC Irrigation Field Day, and others or participating on the board and just being part of the general discussion will provide opportunities to learn from and form partner-

ships with other irrigation farmers.

Although ICDC has undergone a significant amount of change in its 20 plus years of existence, it has always strived to meet the R and D needs of its membership. ICDC continues to focus on growth and is in the process of expanding its infrastructure in order to maintain and grow its research program.

The province has great potential for growing its irrigation sector but in order to do so irrigation has to be profitable at the farm level. The work that ICDC conducts is fundamental for helping to deliver on this potential.

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2019 ICDC Horticulture Demonstration Program

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The horticultural industry in Saskatchewan is growing. Processing opportunities are being investigated in the areas of nutraceuticals, ethanol and the more traditional canned and frozen goods. As these opportunities are investigated, questions often arise regarding potential crops and markets. Producers do not have enough information on these crops to make informed decisions; nor the land or equipment to run their own trial. Because many of these opportunities are high value and deserve further investigation, the Saskatchewan Vegetable Growers Association applied for funding through the Canadian Agricultural Partnership (CAP) for the ADOPT trial, Crops with Opportunities.

This ADOPT trial provided the opportunity to demonstrate the potential to produce pepita pumpkin, chicory, soft neck garlic, sugar beet, Jerusalem artichoke, mung bean, sweet potato and karela in Saskatchewan. It provided producers examples of the crops, allowing them to assess growth habit, hardiness in Saskatchewan and provided some basic idea on potential yields in Saskatchewan.



Pepita Pumpkin

Pepita pumpkins were included in this trial because they are successfully grown in home gardens in Saskatchewan. While slightly less hardy than traditional pumpkins, they mature in 90 days and when transplanted should produce good yields of hullless pumpkin seeds. The seeds can be eaten as pepitas or pressed to extract oils.

Pepitas are high in omega-6 and omega-9 fatty acids, zinc

and vitamin E. The pumpkins are also large enough to be used as Halloween pumpkins or ornamental gourds.

The potential for growing **chicory** has been identified in the cultivation of its root. The root can be roasted and ground, producing a coffee substitute or used to produce a high quality inulin. Inulin is used as a food ingredient in low-fat, calorie reduced products and can act as a natural sugar replacement for diabetics.

Softnecked garlic has been included in this trial, garlic has been grown in Saskatchewan home gardens for years. Typically, hard-necked varieties are grown on the prairies due to their cold hardiness and strong flavor. This has left a gap in the market for

smaller cloves that is not being filled locally. Softnecked garlic produces many, smaller cloves when compared to the hard-necked varieties and could potentially fill the gaps in local markets. Softneck garlic also stores better, so could provide fresh local garlic well into the storage season.

Sugar beets have been identified as a crop with opportunities because red beets are well established in Saskatchewan. Currently, Saskatchewan beet growers are discussing an opportunity for ethanol production using red beets. This potential opportunity could also exist for sugar beets, which may have higher ethanol yields due to their higher sugar content.

In Canada, **Jerusalem artichoke** (sunchoke) is mainly grown in Ontario, but has successfully been grown on the prairies. It has culinary uses, as well as uses as a forage crop. The tubers produced contain no starch and are a good source of inulin. In recent years, the Jerusalem artichoke has also attracted interest as a source of fuel-grade ethanol.

Mung Bean is traditionally a warm season crop. It's inclusion in this trial is based on AAFC conducting research to find varieties suitable to Manitoba and Alberta, since 2010. Mung bean varieties have been identified as having processing potential for both starch and protein. These new varieties mature in 100 days while producing good yields. Alberta and Manitoba have had a head start at developing markets for this crop, but a number of inquiries have been made in Saskatchewan.



Sweet Potato

Sweet potato was included in this trial and demonstrated in a high tunnel. Sweet potato is not traditionally a crop that we are able to grow in Saskatchewan due to our shorter growing season. However, Vineland Research and Innovation Centre in Ontario has recently released a new short season variety, Radiance, that may be a fit for growing in Saskatchewan conditions.

Local retailers are very interested in this variety and the possibility of a local supply.

The last crop that was included in this trial is **karela**. Also known as bitter melon, it is popular in Asian cuisine and can also be used as a nutraceutical. Retailers in Saskatchewan and from National chains have requested karela as it is not readily available. Research done in high tunnels at the University of Guelph shows that karela production should be possible in high tunnels in Saskatchewan.

The findings from this trial concluded that five of the eight crops showed economic potential and warranted further investigation.

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2019 ICDC Horticulture Demonstration Program Overview

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tion. Chicory, pepita pumpkins, sugar beets, karela and sweet potatoes all produced well and did not show any large obstacles to production in Saskatchewan. The softnecked garlic and mung beans did not thrive. The softneck garlic should have survived, therefore diseased seed may have been the cause and further investigation is



Chicory

possibly needed. The mung

beans' poor growth was likely due to unfavorable environmental conditions. The Jerusalem artichokes grew well and produced tubers, but a lack of market, poor storability and the difficulty of harvest does not warrant further research until marketing opportunities have been identified.

If you are interested in growing these crops commercially, or have recommendations of crops that you would like to see demonstrated in the future please contact Cara Drury at cara.drury@mail.gov.sk or (306) 867-5517 Crops and Irrigation Branch, Saskatchewan Ministry of Agriculture for advice and assistance.

Save the date:

CSIDC Field Day and Tradeshow

July 9, 2020

Irrigation Saskatchewan ICDC—Youtube

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- In field crop walks
- workshop presentations
- All videos can also be found on the ICDC website

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Enhanced Efficiency Fertilizer in Irrigated Crop Production

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ICDC has conducted a series of projects at the research station and on local irrigated production fields evaluating potential yield benefits of enhanced efficiency nitrogen fertilizers. These products have been developed to minimize nitrogen losses from volatilization and denitrification. A 2018 randomized complete block design trial with four replications compared fourteen treatments: combinations of four nitrogen sources – bare urea, Agrotain urea, Super U and ESN and three placement methods – fall banding, fall broadcast, and spring sidebanded. The best performing placement was fall banded N, but spring side-banded urea was statistically equal. The best performing products were ESN and Super U, but both of these products come with a premium added cost. Urea coated with a polymer (ESN) floats on water until the membrane becomes leaky from adsorption of moisture. ESN is not suitable for broadcast surface application. This product must be placed into the soil to avoid redistribution by drainage water. Another challenge for ESN is that when the product is placed into dry soil, release of the nitrogen is delayed until the moisture and temperature criteria are satisfied. This delay may hinder crop growth if crop uptake of nitrogen is restricted due to a shortage of nitrogen in the soil. Irrigation normally overcomes this shortcoming for this product.

A 2018 field demonstration included four nitrogen products: bare urea, Agrotain treated urea, Amidas, and Super U broadcast just prior to seeding. The seeding operation and early sprinkler irrigation incorporated the nitrogen products into the soil. The 2019 project was fall applied over a light blanket of snow (November 20) on slightly frozen soil. Although Super U yielded best and second best among the treatments in the two years of field demonstration, the yields indicated the crop benefited from use of both a urease inhibitor and a nitrification inhibitor. The enhanced efficiency nitrogen sources add between 8 to 15 cents per pound of N to the cost of the nitrogen source depending on product choice. If one pound of N cost 50 cents, this increases the cost of N fertilization by 15% to 30%, a significant impact on crop input costs. Please refer to the link for a chart which shows the impact of the cost difference on economic performance of the fertilizer sources. Economic analysis with the products used in the ICDC field demonstrations shows that the additional cost may be worth the expense economically without considering the environmental benefit.

To read the full article view the March supplement on the website at: <https://irrigationsaskatchewan.com/icdc/publications/irrigator/>.

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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

To be the leading research and development organization for maximizing the value of irrigation.

ICDC Mission

To research and provide leadership in irrigation production.

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.



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