THE IRRIGATOR

March 2018

Research Director's Corner

Garry Hnatowich, Research Director
Irrigation Crop Diversification Corporation

Once again I use this forum as an opportunity to review the past year and provide an update to ICDC members as to the changes, challenges and opportunities that exist for your organization.

As we're all aware the 2017 growing season can be best described as hot and dry. It was an ideal year to demonstrate the benefit of being an irrigation producer. It's noteworthy to point out that to many of our young generation of producers 2017 was their first exposure to drought. The past decade has been one of average, or well above average, rainfall which certainly diminishes the advantages of being an irrigator. A year like 2017 puts "drylanders" to thinking!

That said irrigation isn't a guarantee of maximum yields in that the cool seasons crops in 2017 still had yield limitations due to the heat of the season. At Outlook we noticed flower blasting in crops such as canola, faba bean and even cereals. Consequently yields were lower than what we've achieved under cooler, cloudier and calmer growing seasons. On the flip side the heat loving crops such as dry bean, soybean and corn were in their element and yielded accordingly.

It was another large and varied research study year with approximately 60 individual trials or demonstrations being conducted. Varietal evaluation of field crops has continued to be of primary importance and maintains much of our focus. In terms of the overall ICDC program variety assessment accounts for approximately 38% of our trials but 67% of the total number of plots seeded and about the same with respect to land base allocation. Last season we evaluated approximately 166 cereal varieties (spring & winter wheat, durum, barley, oat, fall rye and corn), 94 oilseed varieties (canola, flax), 120 pulse varieties (pea, dry bean, soybean, faba bean), numerous forage legume & grass varieties, and a number of potential field crops were assessed

(Quinoa, Niger, Borage and Marrowfat pea).

ICDC again maintained a strong fruit & vegetable program consisting of 9 projects. As horticulture is a recent activity for ICDC we continue to rely on the guidance of the Saskatchewan Ministry of Agriculture (SMA) and Agriculture & Agri-Food Canada (AAFC) staff and are thankful for their assistance. We believe there are large opportunities within this component of the agriculture industry and irrigation will be essential.

For the first time in ICDC's existence the number of agronomy trials conducted exceeded the number of variety conducted. The field crop agronomy portion of the ICDC program represented approximately 44% of our total program. As has been the case these trials are a combination of longer term, usually 3 year duration, and short term annual evaluations. The longer term projects are all small plot, replicated type of trials. Short term projects are typically one year in duration but sometimes two and comprise a mix of small plot trialing along with non-replicated and/or field demonstration type projects. As always I encourage all to visit the ICDC website and view the annual reports of these projects at http://irrigationsaskatchewan.com.

We obviously played an important role, along with SIPA, in the success of the 2017 CSIDC Field Day held last July 13 and plans are already underway for this seasons Field Day scheduled for July 12. In addition ICDC held a separate field tour focused on our internal program last August, and participated in an evening tour of CSIDC and a tour by the Saskatchewan Vegetable Growers Association. Co-partnering with the SMA, with financial contributions from the Saskatchewan Pulse Growers, ICDC hosted a "Soybean Field Day and Roadshow" event on August 17, 2017. Participants paid $50 to attend and the tour involved reviewing soybean research conducted at CSIDC and an afternoon of disease field scouting with Dr. Dean Malvick from the University of Minnesota. Registration was limited to 50 and the event was

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ICDC Irrigation Crop Diversification Corporation
Box 1460, 901 McKenzie Street South
Outlook, SK S0L 2N0

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sold out. We are planning a similar field day in 2018 that will be all about beans – soybean and dry bean.

The past year has been busy for staff and the Board of Directors on a variety of administrative fronts. Changes required in the way our financial auditing needs to be reported kept our Administrator, Brenda Joyes, busy last year and she has begun the process again as this goes to print. As ICDC was created under the Irrigation Act a yearly audit submitted to the Provincial Government is required. Although a cost, this process is worthy, Brenda continues to refine our financials in such a way that the Board, and auditors, are fully informed of our cash flow situation.

The province has opened up the *Irrigation Act of 1996* and Staff and/or members have been in several consultations over the past year to modernize and refresh certain aspects of the act with respect to ICDC. In general, we don't envision any actual changes to the ICDC component of the Act to affect us greatly. However, ICDC has been informed that the Province desires ICDC to assume responsibility for the collection of levies from irrigators outside of an Irrigation District. In the past, the Province has provided funds on behalf of these producers. We are presently working with the Province to seek out a method of identifying these producers and a method of levy collection. This is not an easy task for a variety of both legal and administrative reasons. The Board's opinion is that our annual levy contributions will be reduced due to our inability to properly identify non-district irrigators, through non-compliance of payment and by higher administrative costs on the part of ICDC. We continue to work on this front. On a positive side it will allow ICDC to expand our sphere of influence, which frankly has been limited to Districts, and hopefully engage individuals that have not played an active prior part in ICDC. Asset transfers are occupying a large part in District irrigator's minds and concerns, undoubtedly this will influence an irrigator's financial bottom line. ICDC'S research program and mandate is to provide sound agronomic and economic recommendations for irrigation production. This makes it more important that producers follow what research is being conducted by ICDC and engage with us in project ideas to ensure we are assisting you in whatever means we can.

The Board and staff recently spent two days developing a five-year Strategic Plan for ICDC. We identified a number of priorities that need to be addressed going forward. Some of these will be outlined in greater detail at the next AGM in December, but one is the need for infrastructure building. It has become clear that our present land allocation or access at CSIDC is insufficient to maintain our program. Recognizing this ICDC entered into a long-term rental arrangement with the town of Outlook for 12 acres of land adjacent to CSIDC and purchased a linear irrigation system for it. This ground became operational in 2017. However this land, while of great assistance, is insufficient for our program size. ICDC will need, through a rent or purchase arrangement, to secure additional land to operate on. Consequently, for 2018 & 2019 we have entered into a rental agreement for up to 80 acres of irrigated land approximately 10 miles from CSIDC. This land will also be made available to co-operating partners such as AAFC and the University of Saskatchewan for conducting irrigation research.

At present we have access to tractors, seeders, etc., that belong to AAFC, but with having rental land distant from CSIDC an inefficiency of operation is imposed, and the demand and need of shared equipment, will be taxed. Therefore we need to begin setting aside monies into an infrastructure fund that, with time, will allow for the purchase of our own equipment. This is a longer term proposition and equipment will be obtained as finances allow.

Should you have any questions or concerns on any aspect of ICDC's program please feel free to contact me at 306-361-6231.

2017 ICDC Horticulture Demonstration Program Overview

Joel Peru, PAg, Provincial Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture
joel.peru@gov.sk.ca

ICDC has wrapped up another successful year of its horticulture demonstration program. This year the program consisted of 9 projects looking at high value crops including red peppers, tomatoes, broccoli, cauliflower, raspberries, haskap, strawberries, shelling peas, Sui Choy and Bok Choy. ICDC collaborated with the Saskatchewan Fruit Growers Association (SFGA) and the Saskatchewan Vegetable Growers Association (SVGA) on these projects and received assistance from the Saskatchewan Ministry of Agriculture and Agriculture and Agri-food Canada. The full final report for these projects can be viewed on ICDC's *2017 Research and Demonstration Report* which is available on ICDC's website or on physical copies available at CSIDC or the Ministry office in Outlook. Below are brief summaries of the results of the 2017 program.

Use of Photoselective Netting to Improve Productivity of Dwarf Sour Cherry, Haskap, and Saskatoon Berry

Photo-selective netting was displayed at the CSIDC Fruit Orchards in Outlook Saskatchewan in 2016, and 2017. Blue, Pearl, and Red photo-selective netting was used to cover Saskatoon

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Disease Control Strategies for Irrigated Rotations

Gary Kruger, PAg, CCA, Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture
gary.kruger@gov.sk.ca

Most people believe plant diseases are caused by plant pathogens such as fungi and bacteria. Although true, this is only a portion of the answer. Plant pathologists have learned that three essential factors - presence of the pathogen, presence of a susceptible host, and a favorable environment - must be present for disease to occur in a field. These factors are described as the disease triangle (Figure 1). The different factors shown in the disease triangle can cause disease to occur at any given time and can change from year to year from field to field. Disease will only appear in the sweet spot of interaction of these three factors. Because all three factors are needed for disease to occur, altering any one of these factors is sufficient to prevent disease.

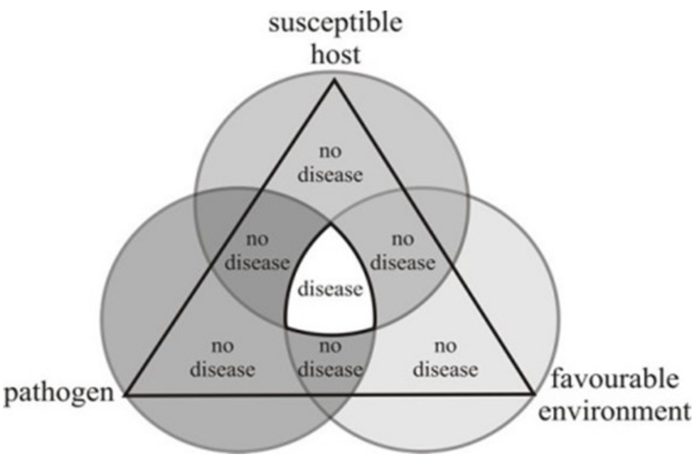


Fig. 1. The Disease Triangle

We can reduce the pathogen by removing the debris it thrives on. Eliminating insects that spread the disease is another strategy. Adjustment of the crop canopy to reduce humidity will reduce the probability of disease developing. Reducing overhead watering will reduce leaf wetness. Applying irrigation water in the morning gives leaves a chance to dry out during the day.

The environment is a huge factor for influencing disease within irrigated rotations. Scheduling water application to manage humidity in the crop canopy can have a great impact on the incidence of disease. The stage of the crop has a major impact on how likely humidity will be retained within the canopy. Seedlings that do not fully provide ground cover are not able to prevent evaporation of humidity from the soil surface. The interaction of these variables can lead us to believe we are doing well in our disease control decision making, when in reality we are just getting lucky that conditions are favorable to disease. Sclerotinia is one disease which may lurk on the edge of outbreak until it surprises us when the conditions for disease align. For this reason, reliance on foliar fungicides alone to control this disease in irrigated fields can fail. Use of the biological control agent, <u>Coniothyrium minitans</u>, can be a helpful asset to reduce the uncertainty for schlerotinia outbreaks. It controls the backlog of sclerotia bodies in the soil that have accumulated from a high frequency of sclerotinia sensitive crops. By focusing on the “presence of pathogen” component of the disease triangle, it offers an innovative strategy to irrigators to control sclerotinia.

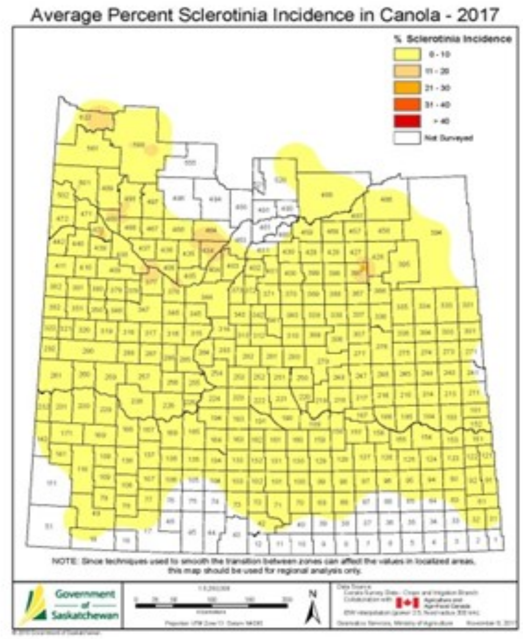


Figure 2: Sclerotinia infection of canola for 2017 (Sask Ministry of Agriculture)

2017 was not a “sclerotinia year” according to the Saskatchewan Ministry of Agriculture’s provincial canola survey (Figure 2). Yet a local ICDC demonstration with Contans on an irrigated site in the Lake Diefenbaker area showed modest yield response for both lentil and dry bean. (See Table 1 below). What makes this result more remarkable is that the yield response occurred even though the grower applied a blanket treatment of foliar fungicide for sclerotinia control to both fields. The downside for the project is that annual application of the biological agent each fall after harvest is required. The upside is that the annual application of the biological agent can be made at a low economical rate with an irrigation pivot when the field is recharged with water following harvest. Registration of this practice is currently being pursued.

Treatment	Lentil Yield (3.5” Irrigation) Average of 3 yield measurements/trt	Yield Increase (lb/ac)	Dry Bean Yield (8” Irrigation) Average of 2 yield measurements/trt	Yield Increase (lb/ac)
Contans	2693 lb/ac	125 (5%)	2887 lb/ac	190 (7%)
No Contans	2568 lb/ac		2697 lb/ac	

Table 1: Impact of Contans on Seed Yield of Lentil and Bean in 2017.

Reclamation of CSIDC Field 12 with Tile Drainage and Irrigation

Kelly Farden, MSc, PAg
Government of Saskatchewan
Manager, Agronomy Services
Crops and Irrigation, Ministry of Agriculture

It has been estimated that approximately 10 to 15% of the irrigated land within the Lake Diefenbaker Development Area (LDDA) is impacted by salinity and/or water-logging. Reclamation of these soils can be achieved through the removal of the excess water and salts from the crops root zone. Tile drainage in combination with strategic irrigation management can provide the means to accomplish both.

A sub-surface tile drainage system was installed in the spring of 2017 on approximately 15 acres of poorly-drained, salinized soils on field 12 at the CSIDC research farm in Outlook. The intention of this installation was to lower the water table and then to actively "leach" the salts downward in the soil profile with the addition of irrigation water.

A tile lay-out plan was designed based on site specific soil and topography considerations (figure 1). Briefly, field 12 consists of fine sandy-loam to loam textured Bradwell soils overlying moderately fine textured silty-lacustrine deposits. The tile lines were spaced at 45 foot intervals and were installed at a depth of 4 feet. Following the installation the field was worked to level out any remaining ruts and then seeded to a cover crop of spring wheat. The field was irrigated periodically throughout the summer to match crop demand. The wheat crop was cut green and baled in late August.

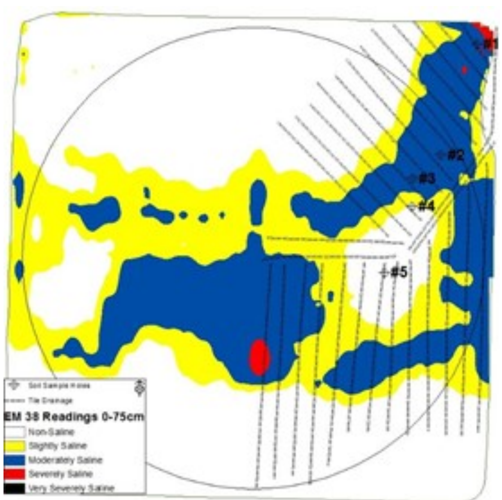


Figure 1. Salinity map of field 12 from fall 2017.

Throughout the month of September approximately 10" of leaching water was applied to the field. Water was reported to run out of the tiles within days of the first leaching application and then continued to run for the remainder of the month. Although the flow from the tile was not measured, it is believed that the majority of the applied water did percolate through the soil and drain out the tile.

From an operational standpoint it was noted that after the soil became saturated it became a challenge to continue to apply water without having water 'run-off' to the depressional areas. In an effort to improve water infiltration, the field was deep-ripped in mid-September. Following this operation, most of the water applied was then able to infiltrate into the soil and percolate downwards.

An EM38 survey was conducted and benchmark soil samples were collected in the spring of 2017 prior to the tile installation. This survey captured the baseline salinity level of the field. Salinity zones were classified within the field as non-, slight, moderate, and severe.

Following the fall leaching operation the field was re-surveyed and soil samples were again collected from the benchmark locations. A visual comparison of the pre- leaching (not depicted) and post-leaching (figure 1) EM38 maps did not reveal any eye-catching difference in the salinity profile following the first year of leaching. However, when taking a closer look at salinity levels in the benchmark soil samples there does seem to be an indication of downward movement of salts (figure 2).

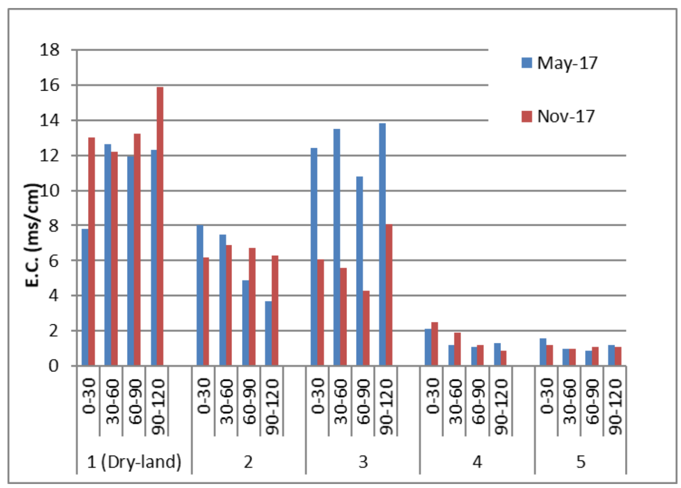


Figure 2. Salinity levels in benchmark soil samples taken in the spring and fall of 2017

Soil sample locations #2 and #3 which were classified as moderately and severely saline respectively in the spring were both found to have decreased salt levels following the leaching application. Soil samples #4 and #5 which were classified as slightly to non-saline respectively in the spring did not seem to change much following the leaching application. Soil sample #1 which is located in the dry-land corner was actually found to have higher levels of salinity in the fall than it did in the summer.

The plan for this field for 2018 will be to seed it to barley and then harvest the grain. Following harvest we will again implement an intensive fall leaching irrigation regime. The field will continue to be monitored on an annual basis to document changes in salinity. Once this land has been reclaimed it will add to the limited land-base that exists at CSIDC for crop research work.

Irrigation Efficiency- Making the Most of Irrigation Water

Jeff Ewen, PAg, Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture
jeff.ewen@gov.sk.ca

Water is a precious resource and arguably the most important input in crop production. Often times in Saskatchewan water is the limiting factor for reaching full yield potential, but irrigation can reduce this limitation. During extended dry periods, such as experienced through the 2017 growing season, even with irrigation it can be difficult to keep up with crop demand for water. This article will cover some tips and tricks for making your irrigation the most efficient and effective.

Irrigation scheduling is the most effective way to manage irrigation to be the most efficient. Irrigation scheduling is the process of determining when and how much water to apply to a crop. Proper irrigation scheduling maximizes crop yields and minimizes water lost through deep percolation and runoff. The Irrigation Crop Diversification Corporation (ICDC) produces an Irrigation Scheduling Manual available online at http://irrigationsaskatchewan.com/icdc.

Specific to irrigation scheduling is the critical watering period. Individual crops vary in both the quantity of water required throughout the growing season and with critical water periods for maximizing yields. During dry periods you might want to make sure you're watering at the most critical times. For example, for potato the critical period is tuber initiation and tuber bulking, whereas for dry bean the critical stage is during flowering and pod-set.

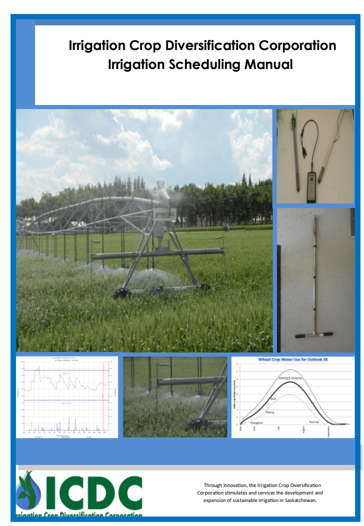
Choice of crop can determine the demand for water. It is widely known that different crops require different amounts of water and that some crops are much more efficient users than others. Pulses for instance, such as peas and lentils, are typically known to be low use and efficient water users. Dry bean, although a pulse, has a low water requirement until late in its growth cycle when it starts requiring high moisture through pod fill. Fababean is the single uncharacteristic pulse that is much less efficient in water use and has a relatively large water requirement. On the other end of the spectrum crops like canola, corn, potato, and alfalfa, will generally have a high water requirement and are less efficient in comparison to Pulses. Cereal crops are typically considered between the low and high water use crops, but they often are thought to be relatively efficient water users for the volume of grain that they produce. Consideration for crop water requirements and irrigation scheduling are of equal importance agronomically as other factors such as weed control and disease management in rotation.

Irrigation application methods and machinery can have some of the largest impacts on irrigation efficiency. Options for longer-term improvements in irrigation efficiency include conversion from less efficient to more efficient irrigation systems. Irrigation systems range from about 50% efficiency using flood irrigation, to all the way up to about 90% efficiency with a low-pressure drop nozzle system. Large efficiency gains can been seen when flood irrigation or wheel-move irrigation is converted to centre pivot irrigation. Irrigators running centre pivot, but are still using overhead sprinklers or high-pressure systems could convert them to low-pressure drop nozzle systems to reduce pumping costs and increase water use efficiency by 10 to 15%. The Irrigation Environmental BMP being offered through the Canadian Agricultural Partnership (CAP) is intended to help producers convert to more efficient irrigation systems, for more information please contact the Crops and Irrigation Branch at (306)-867-5500.

Maintenance of your system plays a critical role in remaining efficient. Like all other machines over time irrigation equipment wears and requires replacement. In particular it is important to pay close attention to your systems nozzles. As the nozzles gradually wear, the holes will get larger, and then your application rates will actually be higher than what your machine is programmed to apply. You can be more efficient if you're watering at the efficiency that it is programmed to do. Nozzle life spans range from about 5 to 10 years, depending on the water source. Water with more sediment will cause faster wear so growers should start checking the nozzles for wear after about five years. Ignoring nozzle wear results in not only higher application rates, but also increase pump supply demands outside of its design which can result in reduced pump life. Failure of a pump not only comes at a large capital cost, but also can put crops in jeopardy of moisture depletion while waiting for repair.

It is within irrigator's best interest to protect the precious resource of water by being as efficient as possible, resulting in reduced costs and increased productivity. Reduced costs and increased productivity equals increase profitability.

***Irrigation Scheduling Manual* produced by Irrigation Crop Diversification Corporation**



2017 ICDC Horticulture Demonstration Program Overview

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berry, Haskap, and University of Saskatchewan dwarf sour cherries, to determine the effect those net colours would have on these crops. The netting gave the typical benefit of protection from wind, rain, insects, disease, and bird foraging but the different colors also had an effect. For example, the blue net appeared to accommodate production of the highest quality fruit, at the highest marketable yield.

Figure 1: Haskap growing under blue photo selective netting

Strawberry and Raspberry Water and Fertilizer Management Demonstration

Different cultivars of raspberry and strawberry were planted under a drip irrigation system in 2016 for a 2 year trial. Production differences were evident between varieties in both crops. Day-neutral strawberries were the most productive in 2016, but displayed much greater sensitivity to high pH soil, evidenced by iron chlorosis symptomology. June bearing strawberries provided greater yields than the day-neutral varieties in 2017. Serenity had the highest yields followed by Kent, then Sapphire and the day-neutral varieties. Foliar application of iron chelates on strawberries reduced the negative impact on growth that this minor fertilizer deficiency caused, and the plants were productive in the fall of 2017.

Demonstration of Bok Choy for season long supply and Demonstration of Sui Choy for season long supply

Six varieties of Bok Choy and six varieties of Sui Choy were evaluated in this demonstration through direct seeding. The results suggest that there are differences in the quality and production of both Bok Choy and Sui Choy between varieties. These projects also compared direct seeding to translating seedlings in terms of productivity. Transplanting resulted in a longer growing season and higher yields due to having a controlled environment for seedling development. There were 6 planting dates for these trials and the last 2 had no or minimum yield.

Demonstration of Cauliflower for season long supply and Demonstration of Broccoli for season long supply

The broccoli and cauliflower demonstration were set up in the same fashion as the Bok Choy and Sui Choy trials. The results of the both trials suggest that there is not much difference in the quality of cauliflower based on method of planting but there was variance among the varieties. In terms of yield, transplanting proved to be far more productive than direct seeding. The average yield for the broccoli trial for transplanted crop was 23,000lb/acre, while direct seeded crop reached up to 12,330lb/acre. The average yield for the cauliflower trial for transplanted crop was 32,300lb/acre, while direct seeded crop reached up to

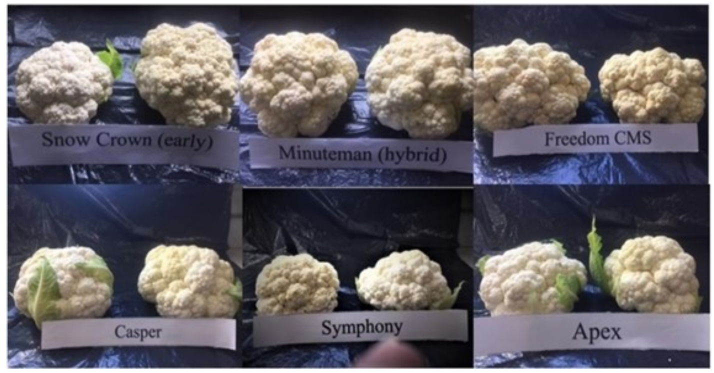


Figure 2: Variance of the Cauliflower Varieties in this Trial

15,000lb/acre.

High Tunnel Trials

The Demonstration of Late Blight Resistant Tomato in high tunnel for season long supply and the Demonstration of Sweet La Rouge Type Red Peppers were completed in high tunnels during the 2017 growing season at CSIDC. The tomato trial did not show any signs of late blight in any varieties, including the susceptible variety. The results suggest that all the varieties performed well in terms of total yield. This trial showed that it is possible to grow 172 tonnes per acre of tomato using irrigated high tunnels in Saskatchewan and that this production could be profitable.

The pepper trial demonstrated varieties that are not grown in large quantities yet, so early market entry could be a benefit for Saskatchewan's vegetable industry. The shape and size of the peppers varied between varieties and some did not ripen to a red color on the vine. This is possibly due to there not being enough accumulated heat units at the end of the 2017 growing season.

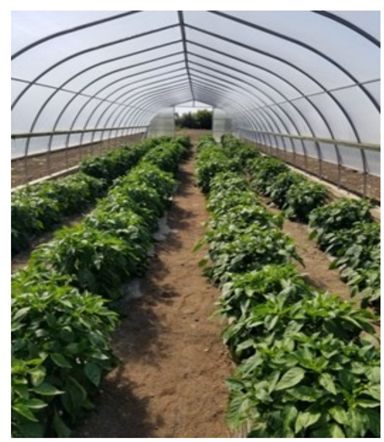


Figure 3: Pepper Trial at CSIDC

Demonstration of shelling peas for mechanical harvest

This project assessed the economic feasibility of growing fresh peas on a commercial level for both the fresh market and the processing industries. This is a crop that has the potential to be fully mechanized which would help lower the labour requirements compared to other horticulture crops. The top performing variety in this demonstration yielded 5,260lb/acre which could generate up to $21,440/acre at retail value.

Selecting Bean Crops for Irrigation in Saskatchewan

Gary Kruger, PAg, CCA, Irrigation Agrologist, Outlook
Saskatchewan Ministry of Agriculture
gary.kruger@gov.sk.ca and
Dale J. Tomasiewicz, PhD, PAg, Irrigation Agronomist
Canada-Saskatchewan Irrigation Diversification Centre

Soybean acres have been increasing on both irrigated and dryland fields in the province as growers search for new profitable cropping options. Our understanding of the agronomic requirements of soybeans has improved as we gained experience growing this relatively new crop to Saskatchewan. Dale Tomasiewicz, Irrigation Agronomist at CSIDC in Outlook, reviewed and conducted a study of moisture requirements for fababean and soybean production. Worldwide, seasonal water use for maximum production of soybean varies from 17.7 to 27.6 inches (Food and Agriculture Organization of the United Nations). This crop water use is considerably higher than what is typically available in Saskatchewan dryland fields. Production of soybean and fababean on dryland may be too risky for producers due to the risk of inadequate precipitation during the late summer.

Dry bean has lower water requirements than soybean and uses a similar amount to wheat. Dry bean has good potential for inclusion in dryland crop rotations. Bauder and Ennen (1981) reported relative seasonal moisture demand for dry bean, spring wheat, and soybean of 10.2, 11.9 and 16.9 inches respectively based on up to four site years of research in eastern North Dakota. The drawbacks of dry bean compared to spring wheat include dry bean's sensitivity to late spring frosts and the potential of moisture stress in August.

Saskatchewan Pulse Growers funded a study of the effects of several moisture treatments on soybean and fababean production from 2015 to 2017 at CSIDC. The first two years experienced near adequate to adequate precipitation during the main irrigation period of July through September. For these two years, irrigation represented only 15-20% of the growing season moisture available to the crop. During the much drier third growing season, irrigation accounted for 60-75% of the water available to the crop. The third cropping year in this project was more typical of Saskatchewan rainfall patterns.

The period of high moisture requirement is longer for soybean than for wheat. In North Dakota crop water use by wheat exceeded 80% of potential evapotranspiration for seven weeks, but for nine weeks by soybean (Figure 2). This explains why August moisture is critical for high yielding soybeans and why irrigation is important to reduce that risk. Soybean is vulnerable to frost injury in fall. A fall frost would be injurious to soybean, but does not damage seed quality as seriously as in canola.

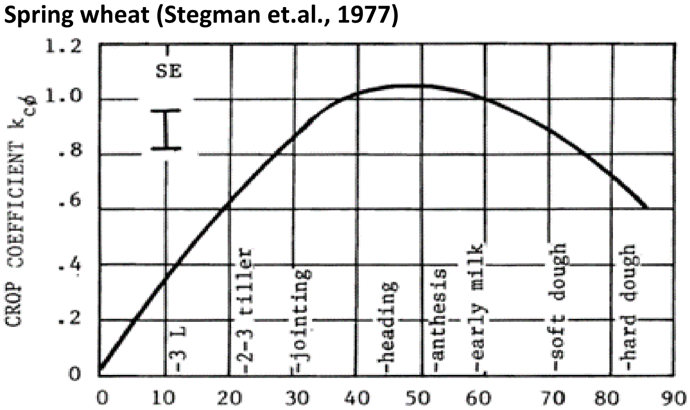
Soybean leaves orient vertically during the heat of the day to reduce heat absorption and water loss (Figure 1). The soybean appears to adapt better to this stress than fababean. Fababean shows much stronger visual wilting during hot days even when the soil has ample soil moisture to meet the needs of the crop.

Figure 1: Wilting of leaves in soybeans suffering moisture stress.

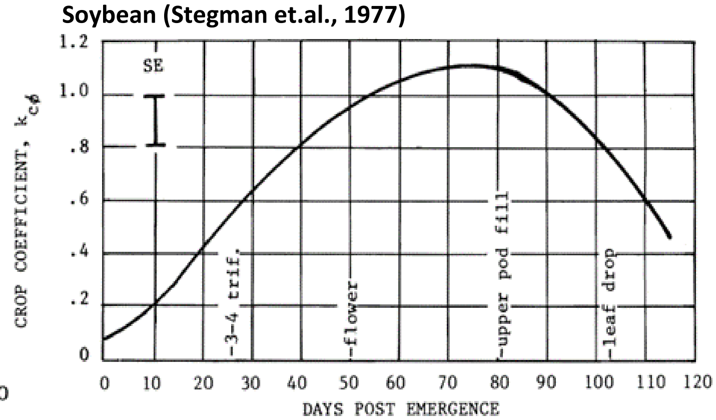
When the water consumption for dry bean, soybean, and fababean are compared in Saskatchewan, fababean uses the most, with soybean second and dry bean the least. The project at Outlook clearly shows that fababean is most dependent on irrigation to meet its moisture requirements. The similarity of dry bean water use to that of spring wheat suggests that the production of dry bean is less prone to drought injury than soybean.

Figure 2: Crop curves for estimating evapotranspiration in SE North Dakota

Spring wheat (Stegman et.al., 1977)



Soybean (Stegman et.al., 1977)



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Selecting Bean Crops for Irrigation in Saskatchewan

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Using the full irrigation treatment at CSIDC in Outlook as an estimate of growing season water requirement over the three years of this project, the fababean received an average of 15.3 inches of water compared to 11.4 inches for soybean. The higher water application to fababean as compared to soybean suggests that fababean has a higher rate of evapotranspiration and is less able to moderate its use of water. This assessment does not take into account that soil reserves of moisture were near full in 2017 and this likely played a major role in the success of both crops for the 2017 growing season. The project has demonstrated that both soybean and fababean can be successfully grown in the Dark Brown soil zone of Saskatchewan with the assistance of irrigation.

Year	Soybean			Fababean		
	Rain-fall (in)	Irri-gation (in)	Total (in)	Rain-fall (in)	Irriga-tion (in)	Total (in)
2015	9.5	1.8	11.3	9.5	2.5	12.0
2016	12.8	0.8	13.6	12.8	2.7	15.5
2017	4.0	5.4	9.4	4.0	14.5	18.5
Aver-age	8.7	2.7	11.4	8.7	6.6	15.3

Table 1: Total water application to full irrigation treatment at Outlook (2015-2017)

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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, Soil Fertility and Crop Rotations

Jeff Ewen, PAg, Provincial Irrigation Agrologist, (306) 867-5512, **Specialty Areas:** Cereals, Oilseeds, Pulses, Technology, and Economics

Joel Peru, PAg, Provincial Irrigation Agrologist, (306) 867-5504, **Specialty Areas:** Horticultural Crops, Specialty Crops, Fertility

Sarah Sommerfeld, PAg, Regional Forage Specialist, (306) 867 5559, **Specialty Area:** Forage Crops

Directors of ICDC

Producer Board Members	**Irrigation District**	**Development Area**	**Term Ends**
Anthony Eliason, Chairperson	Non-District		2018
Nigel Oram, Vice-Chairperson	Grainland	LDDA	2019
Kaitlyn Gifford	SSRID	LDDA	2020
David Bagshaw	Luck Lake	SEDA	2018
Greg Oldhaver	Miry Creek	SWDA	2018
Paul Heglund	Consul-Nashlyn	SWDA	2020
Murray Purcell	Moonlake	NDA	2020

Appointed Board Members	**Organization**	**Term Ends**
Aaron Gray	Saskatchewan Irrigation Projects Association	December 2018
Joel Vanderschaaf	Saskatchewan Irrigation Projects Association	December 2018
Kelly Farden	Manager, Agronomy Services, Crops & Irrigation Branch Saskatchewan Ministry of Agriculture	December 2019
Penny McCall	Executive Director, Crops and Irrigation, Saskatchewan Ministry of Agriculture	December 2019