THE IRRIGATOR

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ICDC Board Report

ICDC goes into "Round 2"

from the Board of Directors

Last December, Saskatchewan's irrigators celebrated the 10th Annual SIPA/ICDC Irrigation Conference with the Hon. Mark Wartman, Minister of Agriculture and Food, and with cake!

Front left: Randy Bergstrom, Rob Oldhaver, Rick Swenson (Chair), Larry Lee. Back left: Scott Wright, Paul Heglund, Kevin Plummer, Francis Kinzie, Neil Stranden, Kelvin Bagshaw, John Linsley.

After 10 years of running a *"value for money R&D"* program for irrigators, the ICDC board has now completely "turned over."

Appreciation for their work done on behalf of irrigators was expressed to the Founding Directors of ICDC: Carl Siemens, John Könst, Darryl McGregor, Dale Ewen, Ken Plummer, Don Fox, Gordon Kent and John Linsley.

In its first 10 years, ICDC:

- negotiated a 10 year agreement with Sask Water for Agrologist services worth about $400,000 per year;
- brought the farmer's voice to the table of the Management Committee of CSIDC, Outlook;
- helped develop irrigation curriculum in all Saskatchewan high schools (Ag in the Classroom and Project WET), SIAST Moose Jaw, the Certified Crop Advisor Program, the Green Certificate Program and the University of Saskatchewan;
- developed a common industry website, www.irrigationsaskatchewan.com, in partnership with SIPA;
- collected R&D priorities from all Irrigation Districts in 1999 and developed a *"value for money R&D"* program in response;
- published annually Crop Varieties for Irrigation, Irrigation Economics and Agronomics, the ICDC Program Report and tabled the ICDC Annual Report in the Legislature;
- through many partners, co-operators and donors delivered *"value for money R&D,"* including:
    - Corn Heat Unit maps for Saskatchewan and the Corn Day

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Planner;
- Irrigated Forage Centres at Maple Creek, Consul, SPARC, Osler, Baildon and CSIDC demonstrating both annual and perennial forages to local irrigators;
- demonstrated the benefits of phosphate fertility on flood irrigation in south west Saskatchewan;
- demonstrated a 400% increase in water use efficiency at Maple Creek by converting flood to sprinklers on irrigable soils;
- demonstrated pocket gopher control to over 600 producers with the "spin-off" of two private practitioners;
- demonstrated dry bean agronomy, seed production and disease control;
- manipulation of cereal protein through late N applications;
- Fusarium surveys and recommendations;
- potato variety development;
- irrigated crop survey around Lake Diefenbaker;
- HAYWATCH Saskatchewan developed as an easy way to harvest the quality of alfalfa you/ your customers want;
- agronomics, varieties and Crop Insurance developed for the timothy industry.

"Round 2"

Now it's time for the new ICDC Board, under the chairmanship of Rick Swenson, to reassess and renew its *"value for money R&D"* agenda for "Round 2", the next 10 years.

ICDC will be:
- negotiating new agreements with SAF and with CSIDC;
- supporting irrigation infill and expansion through an investment attraction strategy;
- developing the website at www.irrigationsaskatchewan.com into a more effective tool for irrigators and for investment attraction;
- commercializing new crop opportunities (such as the strawberry crowns under test this year);
- getting technology into the hands of irrigators;
- continuing irrigated forage work in support of the expanding beef industry and dairy industry;
- going back to Irrigation Districts for their input into the "Round 2" agenda.

Sask. Ag and Food (SAF) update

SAF created a new Irrigation Development Branch that better aligns the resources already in place within the department.

"The Saskatchewan Irrigation Projects Assocation, the Action Committee on the Rural Economy and the Saskatchewan

SAF Minister Mark Wartman cuts the 10th anniversary cake flanked by ICDC's John Könst and SIPA's Roger Pederson and Ron Tittle.

Agrivision Corporation have all asked us to focus our work in irrigation so we can better capture the opportunities offered by high-value crops and livestock production," Minister of Agriculture and Food Mark Wartman said. "We begin that long-term effort by investing in our research facilities and by bringing together the staff and resources needed to chart our path for the future."

The new Irrigation Development Branch will be responsible for irrigation development, technology transfer and regulatory oversight. It will be important for the branch to create a link between irrigation and value-added opportunities, including livestock expansion and higher value crops.

"Both levels of government and individual farmers have made significant investments in irrigation over the past 50 years," Wartman said. "As a result, we now have approximately 340,000 acres under irrigation in Saskatchewan. We will need to continue to grow the industry and develop a critical mass of irrigated acres to fully develop the value-added sector and to increase the value generated from those acres. Government and industry need to take a hard look at what we are doing today and establish what it is that we need to do differently."

Analysis is already underway to establish the feasibility of expanding the province's existing infrastructure or creating new irrigation networks. Results of that research are expected before the end of 2006.

For more information, call 867-5500.

The 10th Annual SIPA/ICDC Irrigation Conference crowd listens to SAF Minister Mark Wartman.

Water Use Efficiency in South West Saskatchewan - and It Tastes Great!

By: Korvin Olfert PAg, Agrologist, SAF Swift Current

If you want to see the optimum in water utilization, make sure to attend the Treasure Valley Market Field Day on July 11th near Cadillac. Set in the midst of the dry Saskatchewan prairie, it is an unusual location to find a fruit orchard.

Irrigated saskatoons.

The Metke family farm was established in 1912 and, like other farms at the time had a large garden. What made the Metke farm unique was that, in the 1920s and early 1930s, at a time when water was scarce, they built a large stock watering dam by blocking off a small steep valley running through the farm. This reservoir was eventually turned into the irrigation water source for their garden. The reservoir only holds 75 acre feet of water and is strictly fed with spring runoff, which means it does not contain any of the poor quality water from groundwater seeps that are common in the area. This water source certainly is a treasure, hence the name Treasure Valley.

Such a small water source would normally not be able to irrigate a large portion of land. However, by using trickle irrigation to maximize efficiency, the Metkes have expanded their irrigated area up to 33 acres. This includes a large market garden which grows the staple vegetables such as potatoes, corn, peas and lettuce, but also less traditional vegetables like asparagus. Fruit production dominates, however, with the likes of saskatoons, strawberries, raspberries and chokecherries. The Metkes have also partnered with the University of Saskatchewan Horticulture division and established an apple tree demonstration orchard. There are also pear and plum trees, blue honeysuckle, melons of all sorts and grapes covering the gate as you walk in. Dwarf cherries fill out the menu offered at this Garden of Eden.

The innovation in the vegetation is mirrored by innovation in the equipment. Maurice Metke built most of the small specialized equipment needed for various tasks within the nursery. Some of Maurice's inventions include a potato digger, a potato planter and hiller, a plastic mulch applicator, various rakes, a reel to roll up the irrigation hose, an Echinacea digger and a straw spreader. Recently, the Metkes have ventured into honey production as well.

Irrigated strawberries.

This year's tour features Clarence Peters and Connie Achtymichuk, Fruit and Vegetable Specialists with Saskatchewan Agriculture and Food, Rick Sawatsky, a Horticulture Expert from the University of Saskatchewan, as well as Troy LaForge, a consulting Agrologist from Green Key Solutions.

Treasure Valley Markets is located eight miles

north and ¾ of a mile west from Cadillac on highway #4, about half an hour south of Swift Current. The field day will start at 6:30 p.m. on July 11th, 2006. Bring along your knives for a hands on grafting demonstration. Take this opportunity to exchange ideas and experiences with commercial food crop producers from across Saskatchewan and to observe the ultimate in high value crops produced with very little of our precious water.

For more information contact:
Korvin Olfert, ICDC, Irrigation Agrologist
778-5041
Linda Metke, Treasure Valley Markets
785-4602

Saskatchewan Corn Day Planner

By: Les Bohrson, Senior Irrigation Agrologist, SAF Swift Current

Great corn crops are created one day at a time. Saskatchewan's irrigated corn is a minimum 130 day marathon from emergence (VE) to optimum utilization. Check out the planner for an outline of the various stages involved. The first 70 days develop the vegetative factory. The warm summer environment, plus the irrigator's precision planting, fertility placement, weed control and moisture management, make every day count.
From silk stage (R1), the next 60 days deliver, through reproduction, the quality and quantity of corn grain energy. One corn kernel planted can return a 500 fold grain increase. Much of the corn's nutritional requirement is still being imported during August and September.

Corn crop.

About two tonnes of dry matter or six tonnes per acre of corn silage yield is added in a frost free month of September. This benefit can be attributed to the many new early maturing corn varieties tested at CSIDC in Outlook and reported on http://www.albertacorn.com/. Early corn has improved 50 per cent in the last 30 years.

Corn day.

The potential irrigated corn production in Saskatchewan requires an accumulation of 2100 to 2500 Corn Heat Units (CHU). Saskatchewan Crop Insurance Corporation provides weather based corn coverage for any killing frosts that occur before 2100 CHU have accumulated. Where you expect less than 2300 CHU, seed an early maturing variety. A warm micro-climate is an important consideration when selecting a field location before planting. Higher CHU are earned on south facing slopes, on warm sandy soils, near shelterbelts, with aggressive residue management, and with uniform air/water

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drainage. Seeding before soils reach 8°C is not recommended.
Emergence (VE) of corn seedling on or before May 24th is assumed. Seed germination and emergence normally require a total of 175 CHU over 12 or more days from seeding. Where seeding is delayed or planned after mid May, earlier corn varieties should be considered.

Early competition from weeds immediately delays seedling growth and impacts performance. Aggressive weed management pays dividends in both yield and quality.
Drought and frost risk must be considered if corn is to be planted. Good field moisture reserves through August and early September are recommended in irrigation scheduling. If you are in a region that experiences early frosts, then consider using an early maturing variety.
Premium dairy quality corn silage is only achieved where the grain development uniformly reaches the half milk line stage (R5.5). Use of a kernel processor is also recommended as the kernel and cob material hardens.
Kernel development drives the kernel moisture down to 32 per cent at maturity or the black layer stage.
The whole plant silage moisture of mature corn kernels is 66 per cent, but can be greatly impacted by early frosts. Expect to wait one month for the uniform kernel moisture to dry down from 32 per cent to 22 per cent.

Corn harvest in the Prairie Provinces can normally wait until late October or November. An advantage of fall and winter grazing of whole corn or corn stover is that ample moisture remaining in the stalks and other plant parts assists in digestion. Spring delays and/or an early fall can cost you up to 200 CHU less than planned, but will still allow the production of silage equivalent to normal barley silage.

Saskatchewan Corn Day Planner

Day #	CHU	Date			Days to Maturity
			Seed at 8C Soil Temp		
		12 May	Seeding Complete, 12 days to Emergence		
134	Start	15 May	Competition Risk		139
143	175	24 May	VE	Emergence	130
			Drought Risk		
181	725	01 Jul	V6	6th Leaf	92
207	1400	27 Jul	VT	Tasseling — Frost Risk	66
212		01 Aug	R1	Silk	61
223		12 Aug	R2	Blister — >30% Loss	50
232		21 Aug	R3	Milk — Kernal Moisture	41
				Silage Moisture	
241	2000	30 Aug	R4	Dough — 70 / 80	32
253		11 Sep	R5	Dent — >20% Loss — 52 / 75	20
263		21 Sep		Half Milk Line — >10% Loss — 40 / 70 — Silage	10
272	2300	30 Sep	R6	Black Layer — 32 / 66 — Kernel Processor	1
287		15 Oct		25 / 60	
300		28 Oct		22 — Combine	

Assumptions: You receive 2300 CHUs on Sept 30 and seeded a 2300 CHU variety. Where you expect less than 2300 CHUs, seed an appropriate earlier variety to match this planner. Delayed planting impacts your quality/yield risk and dictates switching to an earlier corn variety. Protect the your downside with Crop Insurance. **Revised March 2006**

Westside Irrigation Project Final Report Executive Summary

(Prepared by: UMA Engineering Ltd. for the Westside Irrigation Project Steering Committee)
Funded by: The Canada Saskatchewan Water Supply Expansion Program

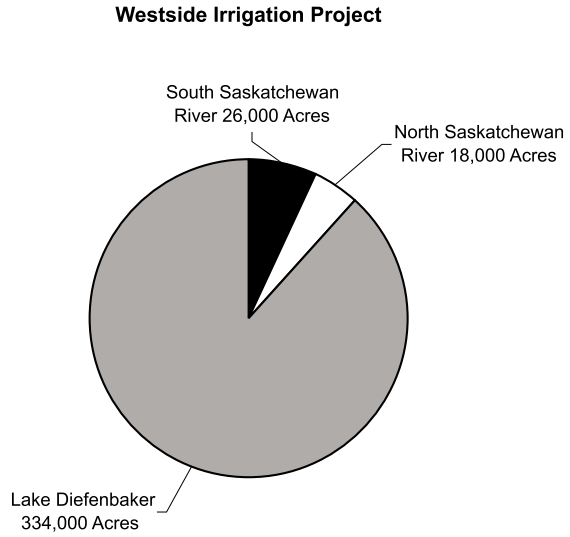
The creation of Lake Diefenbaker offered unprecedented opportunities for multi-use water based development in Saskatchewan. It was envisioned that, when the associated irrigation works were completed, water would be carried to some 450,000 acres of irrigable lands. However, some 40 years later, the irrigation industry still has not achieved anything near to its full potential.
The Westside Irrigation Project represents a block of potential irrigable land in an area parallel to the west bank of the South Saskatchewan River from the Gardiner Dam to Asquith. This 370,000 acre block is located in a part of Saskatchewan that offers some of the best heat units for crop development. Combined with water, producers would have the opportunity to diversify their operations. This area has the potential of becoming one of the most intensive agricultural regions in Canada, fulfilling the original vision of the South Saskatchewan River Project.

This conceptual level study provides the basis for a major development in the west central portion of Saskatchewan. It examines water development alternatives to supply irrigation, municipal, rural domestic, recreation, wildlife and industrial needs within parts of the seven rural municipalities (RMs) in the project area.

Land Suitability for Irrigation

The irrigable blocks selected were contiguous half section land units based on soil survey information, topographic maps, water well maps and geological information. Heavy clay soils were not included. The soil survey information included quarter section salinity data based on municipal assessment data. The exception is the Macrories A, B, C and D blocks, where data was taken from a 1987 study with individual quarter section assignment of irrigability. An irrigated area of 130 acres per quarter section was used to calculate gross acres.

Conservatively, 370,000 potential acres were identified within the study area. Three hundred and thirty four thousand acres are best served from an extension of the West Main Canal (WMC) and Lake Diefenbaker. Twenty six thousand acres could be supplied directly from the South Saskatchewan River, and 18,000 acres could be supplied directly from the North Saskatchewan River.



Irrigation Demand

Water demand was based on serving each irrigated parcel with a center pivot system having a capacity of 7.0 USgpm per acre. The total peak demand was adjusted to account for crop rotation, usage factor, etc., and conveyance efficiency.

The annual consumption was estimated by examining annual diversions for six irrigation districts. Based on these comparisons, the average annual diversion requirement for the

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Irrigation Day Tour and Trade Show

Growing with Water

Coffee and Donuts – 8:30 a.m.
Trade Show begins – 9:00 a.m.
Field Tours – 9:00 a.m., 11:15 a.m. OR 1:30 p.m.
Presentations – 10:30 a.m.
Concession lunch available – 11:30 a.m. to 1:30 p.m.
Haying Demonstration – 1:30 p.m.

Highlights:
Specialty and field crops.
Irrigation systems, including solar pivot.
Season extension for warm-season crops.
Potential irrigation expansion in Saskatchewan.

THURSDAY, JULY 13, 2006

AT THE CANADA-SASKATCHEWAN IRRIGATION

DIVERSIFICATION CENTRE (CSIDC)

901 MCKENZIE STREET SOUTH

OUTLOOK, SASK.

FOR MORE INFORMATION, CONTACT:

CSIDC at (306) 867-5400 or website www.agr.gc.ca/pfra/csidc/csidc.htm

ICDC/SIPA website at www.irrigationsaskatchewan.com

ICDC

Westside Irrigation Project is estimated at 400 mm/acre. The estimated upper decile is 450 mm/acre. This represents a volume of 534,000 and 620,000 dam^3 respectively of water diverted directly from Lake Diefenbaker for 334,000 acres.

Water Availability

Water availability for irrigation out of Lake Diefenbaker was estimated by completing a multi year water balance. Monthly inflow, precipitation, spill uses and releases were simulated for various operation scenarios to determine the total available irrigation water supply. The analysis showed that Lake Diefenbaker is capable of supplying from 370,000 dam^3/yr. to 3.7 million dam^3/yr. depending on spring target levels, operation objectives, water cutoff levels and acceptable magnitude and frequency of shortages.

From a strict water supply perspective, there is enough water available to meet the demands of the proposed Westside Irrigation Project, providing shortages are acceptable in at least 10 per cent of years. A reservation of approximately 106,900 dam^3 currently exists for the Westside Irrigation Project to meet part of the potential demand. Demands in excess of the reservation are considered to be met through increased withdrawals for which no reservation currently exists. Overall, the proposed project would commit a significant portion of the available water out of Lake Diefenbaker.

A project of this magnitude would have a significant impact on water management in the province. A provincial strategy on water management and irrigation development is required to assist in the decision making process. Confirmation of an allocation of water for the project would be subject to the proposal having met the provincial government development processes, and would likely require a project development schedule to retain the water supply commitment.

North Saskatchewan River diversions would not be limited except in extremely low runoff years.

Infrastructure

During the development scenarios, the existing and future infrastructures of SaskPower and Saskatchewan Highways and Transportation were evaluated in terms of the impact to cost and implementation. Most of the proposed pump stations are within 3 km of suitable service power lines. On-farm agricultural development and consequently agricultural processing can only achieve their potential in conjunction with aggressive infrastructure development, i.e., transportation and utilities.

Water Delivery Scenario

For this analysis, the Westside Irrigation Project was divided into two Regions. The Southern Region, which includes the RM of Fertile Valley (285), a portion of the RM of Milden (286), the southern half of the RMs of Montrose (315) and Harris (316); and the Northern Region which includes the northern half of the RMs of Montrose and Harris, the RMs of Vanscoy (345), Perdue (346) and Eagle Creek (376).

The location of the division is marked by a 10 km strip of land considered non-irrigable. The northern region was further sub-divided into the northwest and northeast block.

The Southern Region is the closest to Lake Diefenbaker. It would be easily serviced from the WMC or from an extension of the WMC.

It was recognized early that some of the Northern Region could be best served from a new pump station on the South Saskatchewan or the North Saskatchewan River. However, as the land rises sharply from the rivers, the amount of irrigable land that could be serviced economically from the rivers is limited. Therefore, the majority of the North Region would need to be serviced from an extension of the West Main Canal to the

northwest and then to the northeast.

Due to the very large capacity required to supply the irrigable lands, the only viable supply option was via an open channel main canal (extension of the WMC) into the heart of the irrigable blocks. The route would follow natural land contours modified to minimize land severance and to bypass physical obstacles.

The main canal would require appropriate numbers of control structures, syphons, bridges, farm crossings, drain inlets, cross drains, wasteways and appropriate seepage control measures.

Pump stations located along the main supply canal, supply water to the distribution system which in turn supplies water to individual parcels. The assumed distribution system is a pressurized system using PVC pipe. The farm turnout provides water for the center pivot irrigation system providing an end pressure of 30 psi and delivering 7.0 USgpm per acre. In some of the blocks, a booster pump was used to lift water to an open main canal from which the distribution system was serviced.

Two pumping alternatives to supply the West Main Canal were evaluated.

- Upgrading the existing pumping facility at Diefenbaker Lake (Coteau Creek Pump Station) and increasing the size of the West Main Canal as required.

- Construction of a new pumping facility structure on the South Saskatchewan River downstream of Gardner Dam (Suicide Coulee Site). This alternative would mean that approximately 27 km of existing West Main Canal would not need to be enlarged.

The river option was eliminated due to cost and energy requirements. The upgrading of the pumping facility at Diefenbaker Lake (Coteau Creek Pump Station) is recommended.

The supply system chosen from Diefenbaker Lake includes the following major components:

- The majority of water supply coming from an upgraded Diefenbaker Lake pump station and WMC canal.

- Supplying the southern and northwest to northeast Region by upgrading and extending the existing WMC canal to the northwest. The new canal follows the natural contour to a point 1.2 km north of Tessier, where it divides into two smaller capacity canals. One of the smaller capacity canals proceeds west to a syphon across Eagle Creek, and the other one heads northeast and east to supply the Delisle West – Asquith and Donavan Delisle blocks. The total area of new irrigation blocks supplied from this water supply and distribution concept is 331,271 acres.

- Blocks located at higher elevations (Zealandia, etc.) require a second booster pump to lift water to a main canal system serving that block.

The recommended alignment was reviewed for environmental, species at risk and cultural consideration. Final alignment would consider severance and other land features; however, limited topographic information did not permit further refinement.

Reservoirs

There were three reservoirs, including Conquest, Eagle Hill Creek and Delisle, considered in previous studies that could potentially be integrated into the current scheme concept as peaking reservoirs. The inter-relationship of pumping from Diefenbaker Lake on demand or pumping to off–stream storage will provide some project benefits in terms of capital savings and operational efficiencies.

There is limited available information on any

of the sites (other than Conquest), but there is merit in examining each site in greater detail as a next step. The key benefits of the addition of the three reservoirs are as follows:

1. The costs for Delisle and/or Eagle Creek could be significantly or totally offset against the infrastructure costs that are avoided.

2. It provides significant water management benefits (reduced travel time, etc.).

3. It offers added value to the project (recreational, wetlands, waterfront property etc.).

Cost

The total capital cost, including engineering and contingencies to develop a 331,742 acre scheme supplied from Lake Diefenbaker and excluding on-farm costs, is $1,738 million or $5,247/acre. Including on-farm costs, the cost is $2,109 million or $6,365/acre.

Estimated cost to serve 25,529 acres and 17,670 acres respectively from the South Saskatchewan and North Saskatchewan River, excluding on-farm costs, averages $229 million or $5,302/acre. Including on-farm costs, the cost averages $278 million or $6434/acre.

Project Capital Costs		
	Excluding on-farm ($ million)	Including on-farm ($million)
331,742 Acres from Lake Diefenbaker	$1,738 Million $5,247/acre	$2,109 Million $6,365/acre
25,529 Acres from South Saskatchewan River	$131 Million $5,115/acre	$159 Million $6,208/acre
17,670 Acres from North Saskatchewan River	$98 Million $5,570/acre	$119 Million $6,760/acre

Implementation Plan

From the economic feasibility perspective, the shorter the time frame for the implementation of the project, the greater the benefits gained and, therefore, the better the economics. However, from the practical side, construction will occur over several years.

The proposed implementation plan looks at a 20 year period for the project. The project has been divided into six stages for construction. Each stage will require from two to four years to complete following a two year period for engineering studies, regulatory approvals and land acquisition.

Economics

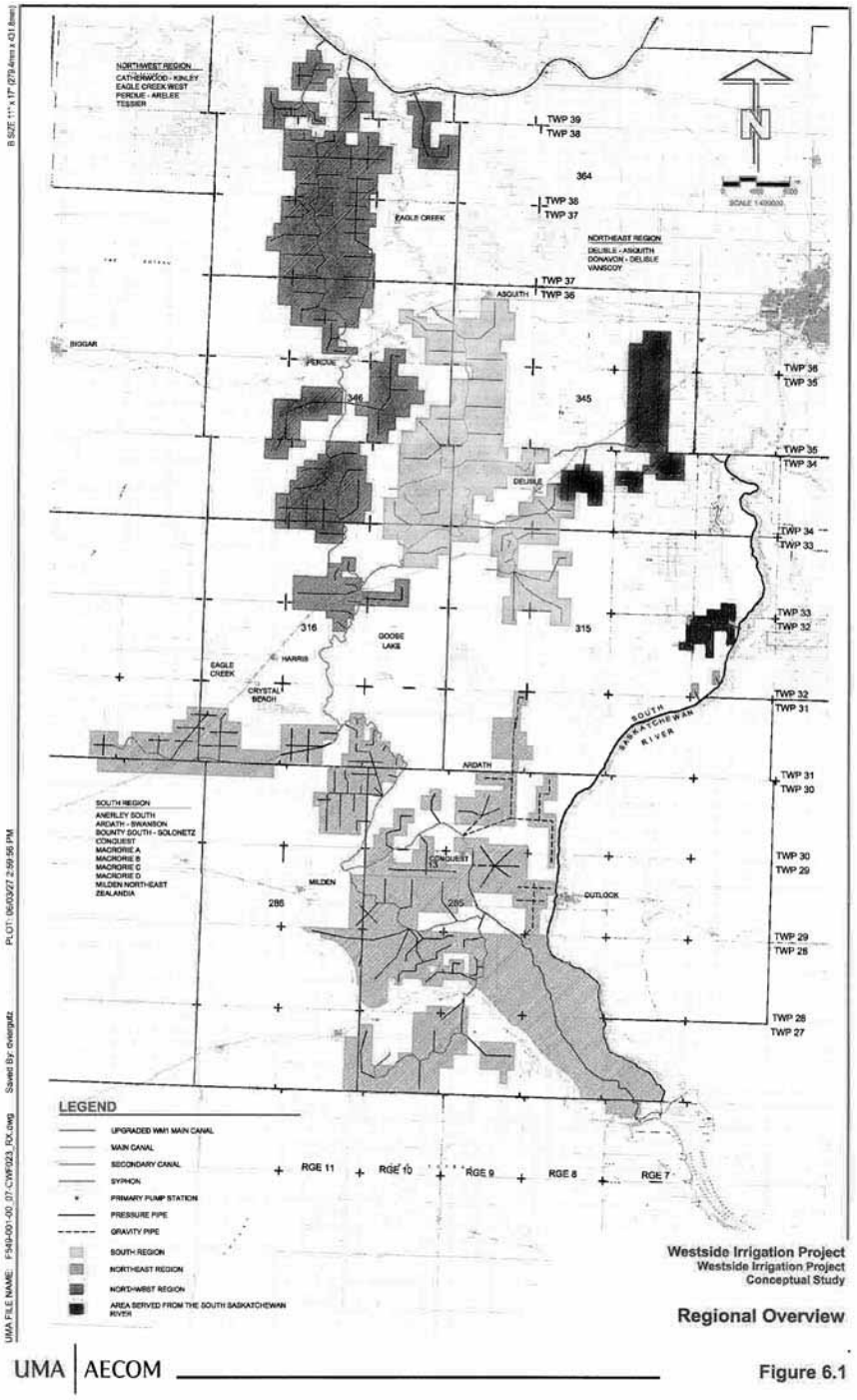
A project of this magnitude has major beneficial effects on the Saskatchewan and Canadian economies. A valuable infrastructure investment has been idle in the WIP area over the last 40 years while irrigated agriculture has continued to grow and prosper in Alberta. In addition to the benefits the WIP would derive from irrigation, water would allow significant societal benefits as a whole. These benefits include the economic spin offs from such a major project, plus the opportunity to supply quality water to municipal, industrial, rural domestic, recreational, wildlife and environmental needs in the region.

- Some blocks of land are obviously more economical to serve than others. However, the differential was not significant enough to conclude that any one block was not economically viable.

- Three scenarios of on-farm development were considered; a traditional canal oilseed mix, a concentration of high value crops (aggressive) and intensive livestock development (livestock).

- The Project is economically sound from a provincial perspective at a five per cent discount rate for the aggressive and livestock development scenarios.

- Farmers' ability to pay project costs beyond the on-farm investment costs is limited. Only



the Aggressive and Livestock scenarios will be able to make a limited contribution to project costs.

- Associated agricultural processing is a must to ensure project viability.

- Livestock producers have the clearest vision of how they will incorporate irrigation into their farm program and will lead the way in irrigation uptake.

- Current non-irrigated agriculture, on average, is operating at negative returns.

- Irrigation will allow greater crop and livestock diversity in the region and contribute to the diversity required to attract agricultural processing into the province.

- Expanded irrigation production in the Westside area will contribute to the critical mass necessary to develop specialized agricultural production and agricultural processing.

All respondents to a questionnaire, developed to document circumstances that are expected to influence uptake rates, indicated that irrigation development was needed even though the development costs may seem high. Costs will only continue to increase. The Saskatchewan agricultural economy will only keep pace with other provinces if initiatives such as this project are implemented.

Drying Rate for Hay Swaths

By: Korvin Olfert PAg, Agrologist SAF, Swift Current

Deciding when to cut your hay is always the most stressful decision when making hay. Do you cut with a 30% chance of showers on the weekend? Whose forecast do you believe, if any? How can you get your hay off in the best condition? It really all comes down to drying rate. Will my hay be dry enough to bale before that next shower comes? What are the factors that affect drying rate, and can you do anything about it?

A lot of the factors that affect drying rate are uncontrollable. You need to work around

ICDC Agrologist Les Bohrson sampling hay quality.

them.

The temperature plays a major role. Obviously, the hotter and sunnier it is, the quicker the hay will dry. The amount of sunshine or solar radiation the hay receives affects the drying time. Both the temperature and solar radiation contribute energy to evaporate the water that is inside the plant.

Relative humidity (RH) simply shows how much water the air can hold, and will vary with temperature as well. Air at 30% R.H. and 35°C will hold more liters of water than air at 30% R.H. and 20°C. Often, the volume of water in the air changes more slowly than the temperature, so when the temperature drops below what the air can hold, the water condenses out in the form of dew. Over the course of 24 hours, you will often have a low R.H. in the afternoon see a rise toward evening, hit 100% overnight causing dew to form and then, as the temperature rises in the morning the dew evaporates. It could all happen with the same total volume of water. Figure 1 shows how moisture relates to R.H. At 90% relative humidity, your hay will not dry below 35%, and 60% R.H. is just about the maximum to achieve safe storage of 15%. Remember, this is the R.H. at the plant surface.

Wind speed will also help dry hay. Basically, all the wind does is mix the air inside the swath with the air surrounding it. In a very dense swath, the atmosphere within the swath can very quickly hit 100% R.H., and a strong wind will help mix that with the lower R.H. air surrounding the swath. This will lower the

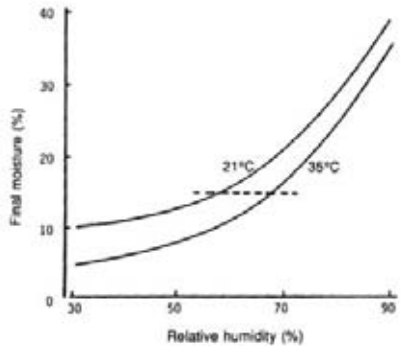


Figure 1. Final Moisture content of hay and relative humidity in relation to ambient temperature. (Van Soest, P. 1994. Nutritional Ecology of the Ruminant. Cornell University Press, p. 216)

RH of the air inside the swath by establishing an equilibrium between the two different humidities.

The swath density is one thing you can change. Obviously, everyone wants the

highest yield possible, but you can spread it out over a larger area. By spreading the swath over a larger area and lowering the swath density, you can significantly alter the drying time by allowing more air circulation and mixing. In some of the hay producing states of the U.S., producers are targeting 70-80% bed utilization. There are some suggestions that we should even go back to the old sickle mowers with 100% bed utilization and then rake it just like our grandfathers did. Perhaps the most practical would be to make the swath as wide as the pickup on your baler. Doing this would remove the option of weaving back and forth to make a nice flat round bale.

This is one of the projects that ICDC is working on this year. We want to quantify the difference between a wide and a narrow swath. Having a bit of grass mixed in an alfalfa stand will also keep the swath fluffed up and promote air circulation.

Excessive soil moistures can provide an added source of water that will prevent drying. The standard recommendation is to turn off the pivot a few days before you cut to give the soil a chance to dry out. A waist high alfalfa stand on a heavier soil type will take more than a few days to dry out the soil. No one should flood their field right before they wanted to cut their hay.

The other thing you can control is the amount of mechanical conditioning. The stem has a tough waxy outer layer that is designed to keep water in. This layer can be broken by using different crimpers or rollers. Basically, you want to break this layer as much as possible and expose the inside of the plant to the atmosphere. The target is to have 90% of the stem cracked, but less than 5% bruising on the leaves.

In summary, there are a few things you can do to speed up the drying of your hay, like crimping and spreading the swath wide, but the most critical factors are still in the hands of Mother Nature. She must provide the energy to evaporate the water and have a low enough relative humidity in the air for a place for the water to go.

Hauling irrigated hay bales.

Check out the redesigned
ICDC SIPA Website at
www.irrigationsaskatchewan.

CSIDC

Annual Field Day and Trade Show, Thursday, July 13, 2006 – 9:00 a.m.
Outlook, Saskatchewan

Irrigation contacts in Saskatchewan

Websites

ICDC/SIPA	www.irrigationsaskatchewan.com
SAF	www.agr.gov.sk.ca go to Crops/Irrigation
CSIDC	www.agr.gc.ca/pfra/csidc/csidc.htm

ICDC Board of Directors

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NDA	Kevin Plummer (Moon Lake ID) 382-2098
LDDA	Neil Stranden (SSRID) 867-1851
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