



# THE IRRIGATOR

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## STRONG DEVELOPMENT MESSAGE RECEIVED AT ANNUAL CONFERENCE

Last December's Annual Conference delegates spoke very strongly in support of irrigation development in Saskatchewan.

### ICDC Board Report



**By Carl Siemens,**  
**ICDC Chair**

This message echoes the recommendations of Action Committee on the Rural Economy (ACRE) that the government of Saskatchewan develop a plan for infrastructure built around key irrigation sites such as, but not limited to, Lake Diefenbaker, the Rafferty and Alameda Reservoirs and the South Saskatchewan River, that includes synchronized public and private investment. ICDC Chair, Carl Siemens, is quoted in ACRE's Final Report: "The

Lake Diefenbaker Development Area is attracting interest from water-short, high-priced-land Alberta cattlemen and from as far away as Prince Edward Island, Idaho and Washington for our "Northern Vigor" top quality seed potatoes.

This conference was the first meeting of all the prairie provinces' Irrigation Associations. Both Manitoba and Saskatchewan had infrastructure development high on their shopping list.

The Central Saskatchewan Irrigation Development group and the Riverhurst Irrigation

District outlined their infrastructure development agenda. The audience included farmers from several areas of the province interested in developing Irrigation Districts.



*Irrigation 2020 Pan-Prairie Panel at the Annual Irrigation Conference in Outlook. L to R: Doug Berry, Pres., Association of Irrigators in Manitoba; Dave Hill, Executive Director of Alberta Irrigation Projects Association; Carl Neggers, Director General of PFRA; Scott Wright, Director of Crop Development Branch, SAFRR; Roger Pederson, Chair of SIPA.*

Irrigation in the south west was described for the benefit of irrigators around Lake Diefenbaker. The future of irrigation districts in the South West is a topic likely to receive more attention from both federal and provincial governments. Is conversion of some of the flood to sprinkler irrigation possible?

*(Continued on page 2)*

## ICDC Board Report

(Continued from page 1)

BJ Boot (Boot Hay Producers), originally from Fort McLeod, Alberta, provided a very positive spin for Saskatchewan by describing “Why in the heck would I move from Alberta to Saskatchewan?”

### 50 YEAR WATER DEVELOPMENT STRATEGY

As a direct result of ICDC and SIPA’s involvement in the 2003 Conference “Water: The Economic Driver of the Future,” Saskatchewan Agrivision Corporation Inc. is working with Clifton Associates Ltd. to prepare a long term water development plan for Saskatchewan. The plan will offer a positive direction for rural economic development based on the sustainable and environmentally sound use of the province’s water resources. Irrigation farmers are a foundation to any economic water development strategy for the province. It is therefore critical that their views on the development of water in the province are heard.

A paper entitled “Planning Ahead: Saskatchewan’s Water Future, Discussing Options in Workshops” was presented and discussed at three March workshops in Outlook, Swift Current and Moose Jaw.

### TRANSPORTATION

As a direct result of Saskatchewan Highways and Transportation’s participation in our 2003 Irrigation Conference, SIPA and ICDC were invited to participate in Saskatchewan Highways

and Transportation’s Primary Weight Consultations, March 24th in Regina.

Here’s a summary of what was presented under the title of Transportation and Irrigated Agriculture:

“Transportation in and out of the Lake Diefenbaker Development Area (LDDA) is a challenge. An improved highway infrastructure is becoming a necessity, with the increase in irrigated acres, the irrigation based business that exists today, and the potential irrigation based business that may operate here in the future. As we will show in this paper, the LDDA has immense potential. With the increase in agricultural production and value-added processing that benefits the provincial economy, improvements to the existing infrastructure are warranted. As water and water resources become more valuable in the future economy, the potential that exists in the LDDA is tremendous.”

A map of a proposed regional infrastructure plan was presented.

### LOOKING BACK...

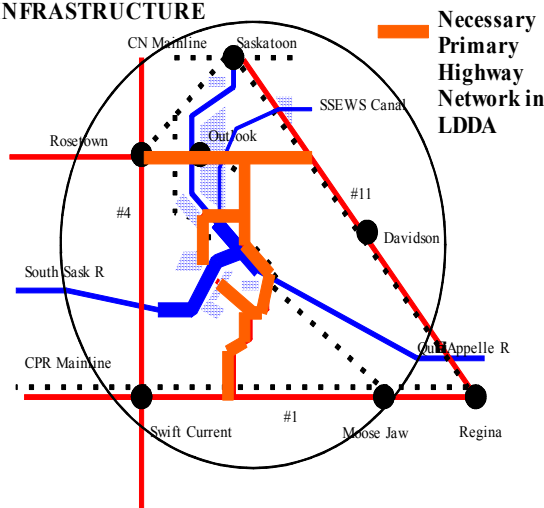
ICDC is changing: new projects, new directors, new partners. The ICDC charge of \$0.35/acre isn’t changing.

ICDC has managed to run a “value for money” R&D program based upon the priorities we collected from all Irrigation Districts in 1999.

Irrigated forages were a high priority for you, and consequently ICDC has demonstrated:

- the benefit of phosphorus fertilization on flood irrigated alfalfa
- six ton/acre top quality irrigated alfalfa production by converting from flood to sprinkler irrigation in the southwest
- irrigated corn for grain, grazing or silage
- effective pocket gopher control (two private practitioners now)
- an easy way to read alfalfa quality right in the field (the HAYWATCH stick)
- annual cereal varieties and annual ryegrass for irrigated forage
- yellow feed

### LDDA INFRASTRUCTURE





*Irrigators listening to "West Side Story," the presentation on the Central Saskatchewan Irrigation Development.*

Irrigated cropping work by ICDC and its partners has:

- shown the feasibility of irrigated bean and bean seed production
- worked on the agronomic package for irrigated timothy-for-export
- published an irrigated crop variety guide and irrigated crop budgets
- supported the irrigated potato industry

ICDC has lobbied on behalf of irrigators:

- met with a succession of ministers regarding irrigation strategy
- helped organize the Annual Irrigation Conferences
- helped organize the Saskatchewan Agrivision Corporation conference "Water: Economic

- Driver of the Future" and subsequently helped develop a 50 year water development strategy
- co-chairs the Irrigation Centre at Outlook, bringing irrigators to the table alongside senior bureaucrats from the federal and provincial governments
- included irrigation information in "Water is Life" curriculum for Ag in the Classroom; worked with the U of S, SIAST and the Green Certificate program to ensure irrigation education and training is available
- met with Saskatchewan Highways and Transportation regarding primary highways
- began a Web site:  
[www.irrigationsaskatchewan.com](http://www.irrigationsaskatchewan.com)

### **...LOOKING FORWARD**

Now ICDC is planning a new round of "value for money" R&D projects to start in 2005. ICDC welcomes new directors as the "founding members" terms expire. Welcome to Kevin Plummer, Rick Swenson, Francis Kinzie (representing non-District irrigators), Larry Lee (a SIPA appointee) and Scott Wright (SAFRR). Our thanks go out to Gordon Kent and Ken Plummer who stepped down after dedicating their time to the work of ICDC and Saskatchewan irrigators.

Check out the Coming Events and the CSIDC Field Day for your chance to interact with ICDC and see for yourself the "value for money" research and development in action. Please feel free to call any of the ICDC directors who work on your behalf.

## **2004 ICDC Program "Value for Money" R & D**

**by Les Bohrsen, Agrologist, SAFRR**

ICDC will again feature Forage Centre projects in 2004. The Dairy Quality Forage Centre includes 28 perennial forages at Peter J. Fehr, Osler and the 21 SeCan Cereal performance and silage trial at Henry P. Friesen, Osler. A comparable SeCan Cereal trial is planned at Cypress Hutterite Colony, Maple Creek.

Larger irrigated Forage Centres are also located at CSIDC, Outlook and SPARC, Swift Current.



*ICDC Corn Field Day attracted 130 people last year to look at grain, silage and grazing options for the crop.*

*continued on page 15*



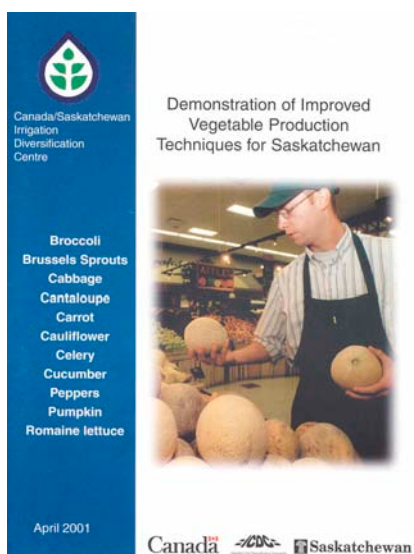
## Irrigation Economics and Agronomics Saskatchewan 2004



Tag team this book with **Demonstration of Improved Vegetable Production Techniques for Saskatchewan** from the Irrigation Centre at Outlook for a more complete set of economic guidelines for irrigation in Saskatchewan.

This publication provides information on both economics and agronomics of irrigated vegetable production in Saskatchewan.

For copies of these publications, call John at 867-5527.



*Demonstration of Improved Vegetable Production Techniques for Saskatchewan*

Thirty irrigated crop budget guidelines and agronomic highlights have been published by ICDC. You will find them on [www.irrigationsaskatchewan.com](http://www.irrigationsaskatchewan.com) under “crops.”

The work was done for ICDC by Grant Pederson PAg last winter. Grant is an irrigator in the South Saskatchewan River Irrigation District, and he worked with other irrigators to “ground truth” the numbers.

For anyone looking at irrigation and needing some guidelines on its costs and returns, this is a good resource for Saskatchewan.

You might be interested to know that under “average” management, the “top crop” list for irrigation - returning over \$100/acre to labour and management - includes potatoes, dry bean, timothy, corn silage and alfalfa.

The table on page five is taken from the publication and is about timothy.



*Irrigating timothy.*



*Cutting timothy.*

ECONOMICS				AGRONOMICS		
<b>CROP:</b>	<b>TIMOTHY</b>			<b>VARIETY SELECTION:</b>		
			<b>My Farm</b>	Use early maturing varieties on irrigation in order to maximize the second cut yield. Discuss with your local dealer and other producers.		
<b>ITEM</b>	<b>#</b>	<b>UNIT</b>	<b>\$/ac</b>	<b>\$/ac</b>		
Seed (only in establishment yr)			\$10.00		<b>SEEDING:</b>	
Seed treatment/inoc			\$0.00		Plant population	500 plants/sq m.
Fertilizer: N	170	lb	\$61.65		TKW	1,232,000 seeds/lb.
P	70	lb	\$16.80		Seeding Rate	4 Lb./ac.
K	60	lb	\$10.43		Seed in the fall (late Aug-early Sept) after a burn off with Glyphosate. Perennial weed control is critical. Seed into a firm seedbed with on-row packing or seed directly into stubble. Irrigate to ensure good stand establishment.	
Herbicide			\$20.49		<b>FERTILIZATION:</b>	
Insecticide			\$0.00		Every tonne of timothy uses 35 lb. N; 10 lb. Phosphate; 40 lb. K. Max of 15 lb./ac. phosphate with the seed in good moisture conditions. Apply 50-100 lb./ac. phosphate prior to seeding. Apply at least 50 lb./ac. N per cut.	
Fungicide			\$0.00		<b>Export Considerations:</b> Japan has a list of toxic items that are banned for import. It includes 2,4-D and the insecticides Lorsban and Pyronex. Rejection of shipment can be a result of presence of quackgrass or other wheat grasses which are host to the Hessian fly.	
Equipment fuel			\$15.00		<b>IRRIGATION:</b>	
Equipment repair			\$18.00		Maintain good soil moisture throughout the growing season. Irrigate immediately after hauling bales from any cut. Use a soil probe to check moisture status. Established timothy will use 1.5"-2"/week of moisture. Ensure adequate soil moisture for germination and establishment and after second cut for fall grazing.	
Custom work			\$25.00			
Irrigation power	16	inches	\$14.77			
Irrigation repair			\$9.23			
Irrigation service/water charge			\$17.50			
Crop insure	0	tons	\$0.00			
Hail insure			\$0.00			
Hired labour	3	hr/ac	\$36.00			
Other			\$6.00			
Farm overhead			\$9.20			
Operating interest	5.3	%	\$7.16			
<b>TOTAL CASH COSTS</b>			<b>\$277.22</b>			
Farm Equipment and Buildings			\$23.19			
Irrigation System			\$22.49			
Specialized Equipment			\$59.87			
Land			\$19.68			
<b>TOTAL NON CASH COSTS</b>			<b>\$125.24</b>			
<b>TOTAL COSTS</b>			<b>\$402.46</b>			
<b>RETURNS</b>	<b>LO</b>	<b>AV</b>	<b>HI</b>			
YIELD t/ac.	3.0	4.0	5.5		<b>HARVEST:</b>	
PRICE \$/t		\$150			Cut when the Timothy has reached its full height with long, coarse stems and heads. Cut before bloom when the plant dries down and cures quickly reducing the risk of weathering. Complete the first cut by mid-July; 2nd cut mid Aug will have smaller heads and finer stems. Cut the outside rounds separately and cut out weedy areas first. Avoid any contamination with straw residue and dirt. Cut with a haybine or discbine, crimp and turn for rapid swath drying. Grazing is not recommended.	
<b>GROSS</b>	<b>\$450</b>	<b>\$600</b>	<b>\$825</b>		<b>HANDLING, STORAGE &amp; GRADING:</b>	
<b>RETURN TO</b>					Export timothy must be 12% moisture or lower so bale at 14% or lower. Timothy for export should be shedded on 6 ml poly sheeting.	
<b>LABOUR and</b>	<b>\$48</b>	<b>\$198</b>	<b>\$423</b>		<b>ROTATIONS AND CROP</b>	
<b>MGT</b>					<b>PROTECTION:</b>	
SPECIALIZED EQUIPMENT			\$/ac/yr		Achieve, MCPA, Lontrel, Banvel and Target may be used. Timothy is susceptible to residue damage from Edge, Trifluralins, sulphonyl ureas, Tordon, Atrazine and Princep.	
Mower/condition			\$4.15			
Big square baler			\$15.04			
Bale Mover			\$5.20			
Swath inverter			\$2.01			
Storage shed			\$33.47			
0			\$0.00			
0			\$0.00			
<b>TOTAL</b>			<b>\$59.87</b>			

**MORE INFORMATION:**

Call an ICDC Agro: Outlook (306) 867-5407; Swift Current (306) 778-5043.  
Refer to the list of publications on the back page.  
Check the Web site: [www.irrigationsaskatchewan.com](http://www.irrigationsaskatchewan.com).  
Use The Timothy Production Handbook from The Canadian Hay Assoc.

## Pocket Gopher control too costly for some crops

*Reprinted with permission from the Western Producer. By Karen Morrison, Saskatoon*

Farmers have mixed feelings about the value of baiting pocket gophers, finding the money better spent on irrigated acres than dryland.

These findings come from a three-year pocket gopher control project initiated by the Irrigation Crop Diversification Corp. on 2,750 acres in the Lake Diefenbaker area.

Les Bohrson, senior agrologist with irrigation resources at Saskatchewan Agriculture, Food and Rural Revitalization, said the study found farmers more willing to pay for mole baiting to protect higher value crops such as alfalfa used for seed or dairy feed.

“They do it to protect irrigated land but not on dryland and lower value forages,” he said.

Bohrson said pocket gophers, commonly referred to as moles, are spreading out of the black soil zones into brown and dark brown soils. The animals also favour moist irrigated land that is easier to dig.

Bohrson thought most farmers would want to push the rodents back at the source in tree rows, ditches, fence lines and road allowances, but the farmers preferred to deal with them in their fields where the mounds plug and wear down machinery.

Farmers found trapping as a control method too time-consuming, unfeasible, inconvenient and more suited to preventing mole populations than reducing an established group.

Most felt hiring a pest control officer was more economical than trying to do it themselves during their busy season.

### Bait is better

Bohrson said the solitary nature of the seldom seen rodent makes it difficult to control with trapping, so, in the study, baiting with a zinc phosphide product was offered to lure them to a central area in the study.

Richardson’s ground squirrels, more commonly



*Baiting gopher holes.*

known as gophers, are another concern in farm fields, he said, but are more visible and easier to trap.

Half the control costs in the study were paid by the corporation, with the producer responsible for the remainder and for levelling their fields in spring.

The research found control possible for about \$3.50 an acre, not including the cost of baiting.

That’s an affordable price to alfalfa grower and hay processor Greg Sommerfeld of Broderick, Sask., who participated in the project.

“The cost is minimal,” he said.

He has gone from levelling the field to doing twice-annual preventive maintenance on his dry and irrigated acres, poisoning the rodents at the perimeters of his fields.

On a 160-acre field, that meant baiting about 10-15 acres, he said.

This preventive maintenance has resulted in a cleaner, more productive stand of hay and less wear on the machines.

“When you get mounds of dirt all over, there’s nothing growing there, that’s for sure,” said Sommerfeld.

Added Bohrson: “We don’t expect to get rid of the pocket gopher, but are trying to control their effects.

“We’ve been able to make the cutting situation better, but we can never walk away and say we’re done.”



# Growing Vegetables and Turning a Profit for the First Time in Years

**Farm and Food Report, May 2004.**  
**By Margaret Hryniuk**

After six years of growing grain on 1,500 acres near Saskatoon and only breaking even, Ken Plummer and his son Kevin downsized to 250 acres and started growing vegetables on a few of the 50 acres that were irrigated. It was the first year they showed a profit. Needless to say, they are growing a lot more vegetables now.

Although 2000 was their first year for growing vegetables, Ken was no horticulture neophyte. Born on the land his father bought in 1919, he and his family grew potatoes and carrots and delivered them by horse and dray to Saskatoon stores and restaurants during the years when these vegetables were worth more than grain. But the long hours of manual labour dissuaded Ken from continuing to grow vegetables and, when it was time for him to make his way in the world, he not only grain-farmed and raised cattle from the home quarter, he established a kitchen cabinet store in Saskatoon.

"After 25 years, I sold the kitchen cabinet store and, because I enjoyed farming and I wasn't ready to retire, Kevin and I decided to make the farm bigger and do it right. We owned 80 acres, rented 1,250 acres, and bought all the equipment necessary to carry out farming in a big way. But some of the rented land was as far away as 25 kilometres, so seeding and harvesting was a real chore. And we weren't making much money. So, four years ago, we downsized by letting go of most of the rented land."

It was the right move at the right time: not only did they have more hours with which to try

something new, the potato industry was beginning to expand again. They started with 10 acres of potatoes, supplemented by one acre of other vegetables for selling at a roadside stand. Today they have 15 acres of potatoes, two and a half acres of vegetables, and a 1,000-square-foot greenhouse with supplemental heat to start their tomatoes, bell peppers and English cucumbers. Production has improved every year.

"We started with a quarter acre of corn, but now we have an entire acre with staggered plantings so we can offer fresh corn over an extended period. This has worked out well for us. Last year was our first year for cantaloupe, and they really produced. We let them ripen on the vine so they're much sweeter: last year, for example, a couple driving through to Calgary bought two or three cantaloupe and, after driving on about 35 kilometres, turned around and came back for

six more. They taste that good.

"Pickling cucumbers were big producers for us last year too. In fact, we were so sick of picking them, we

finally ripped out the vines. We made \$2,000 from our half acre of pumpkins last year," says Plummer.

Not only does mechanization make vegetable farming more appealing today, he says, there's no need for the root cellar of his childhood. All the potatoes are contracted before seeding, and all the vegetables are sold at the roadside stand. Of the latter, Plummer credits "Location, location, location," which is on the busy Valley Road and includes neighbours such as The Berry Barn and the Moon Lake Golf Course.

The Plummer family's success is due to quality as well as location, however. Moon Lake Farm entered its Dark Red Norland potato in the 2003 Canadian Western Agribition potato competition, and took first prize in the red potato category, as well as Reserve Grand Champion for Western



*"We made \$2,000 from our half acre of pumpkins last year."*

Canada. The Grand Champion for Western Canada was a white potato from Courtenay, British Columbia.

Plummer says their successes are also due to research, publications and the “Demonstration of Improved Vegetable Production Techniques for Saskatchewan” at the Canada-Saskatchewan Irrigation Diversification Centre at Outlook. Ken and Kevin Plummer have been active in several different irrigation organizations as well: Ken, for example, has been on the Irrigation Crop Diversification Corporation (ICDC) board of directors for six years, was a founding member (1983) of the Moon Lake Irrigation

District, and served as its chairman for many years. Kevin is now the chairman of the Moon Lake Irrigation District.

“We’ve been heavily involved in irrigation organizations because, without irrigation, we certainly wouldn’t be growing potatoes. We have no regrets about downsizing and growing irrigated vegetables either. The returns are sure better than just breaking even,” says Plummer.

**Ken Plummer**  
**Moon Lake Farm**  
**Box 97, RR # 3, Saskatoon, Sask., S7K 3J6**  
**Telephone: 306-382-1284**

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## Report from the Timothy Producer Workshop in Lethbridge

*By Korvin Olfert PAg*

The 2004 Alberta publication “Cropping Alternatives for Irrigation in Alberta” shows that timothy has fallen to fourth place in the ranking of crops potentially making the most money. Potatoes and sugar beets are always near the top, but with the drought last year, cereal silage has taken over third spot.

The drought also affected timothy yields, with lower overall production last year. Processors are still optimistic, however, about record crops this coming year.

Even with a record crop, demand for timothy is still increasing due to the potential of untapped markets in India (India produces almost as much milk as the entire European Union), and with the horse population of the U.S. soon expected to exceed the number of cows.

The Japanese market is stable or declining, although some market share may be attracted away from other countries.

Dr. Dave Christensen from the University of Saskatchewan spoke about the benefits of second cut timothy in dairy rations. Cut early enough, timothy quality approaches alfalfa or barley. The



*Swathing irrigated timothy.*

quality is probably not high enough to make a first trimester ration, but certainly could make later rations depending on the price.

Dr. Ross McKenzie spoke about nitrates in timothy and said there was a new fertilizer being developed for approval (a polymer coated urea that minimizes volatilization losses). He recommended applying urea fertilizers early in the spring (six weeks before cutting), or non-urea based fertilizers later on.

For more information on irrigated timothy, contact Korvin at 778-5041, the Canadian Hay Association at 1-888-541-0911 or visit [www.canadianhay.com](http://www.canadianhay.com).



## Using Irrigation to Feed a Large Dairy

By Korvin Olfert PAg



*Corn, centre pivot and silo: a dynamite combination for the milk producer.*

How many dairy cows can one pivot feed? At the highest production, a dairy cow can produce 40 kg of milk a day. The ration of a first trimester dairy cow is probably the most complicated ration to balance for a couple of reasons. First, you hope to keep the cow four to five years of production, so you don't want to burn out her rumen with acidosis. Also, with milk production that high, she has incredibly high energy demands. Dairy nutritionists actually don't know how to get enough feed into her to keep her from losing weight during this period. To keep it simple, we will just look at Total Digestible Nutrients (TDN) and Crude Protein (CP). A 600 kg dairy cow's requirements are about four kg of Crude Protein (CP), and 17 kg of TDN a day in the first trimester.

That works out to a typical first trimester ration of about 18% CP, and 73% TDN, with an intake of about 25 kg DM (Dry Matter)/day. The

question becomes, "what crops can I grow to produce the ingredients to fulfill that ration?" You have to also remember that a dairy ration is about 50% forage and 50% concentrate. The concentrate will provide most of the TDN, and anything lacking in the forage. Whatever crop you grow will minimize what you need to add in the concentrate.

Let's make some assumptions and do some math to figure out how many dairy cows a pivot can feed.

In order to do that, we need to know how much a cow eats. If half of the cow's 25 kg DM/day ration comes from the forage, she would eat about 13 kg DM of forage per day. In 90 days, that 300 cow herd would eat about 337 tonnes of those. The new large dairies have a milking herd of about 300 cows. For the second trimester, intake is cut back a bit to about 22 kg DM/day, or about 11 kg DM from the forage. In the next 90 days, a 300 cow herd would eat about 304 tonnes DM. For the last trimester, intake decreases even more to about 19 kg DM/day, or about 10 kg DM/day from the forage. So in these 90 days, the 300 cow herd would eat 257 tonnes DM. During the dry period, intake is restricted to only 12 kg DM/day. This is to prevent the cows from getting fat just before calving. Although there is no energy requirement for lactation, there is a smaller but increasing energy demand for pregnancy. Most of this ration would be forage, with only a small amount of concentrate. So, a 300 cow herd would eat about 324 tonnes during these 60 days. Altogether, a 300 cow dairy herd eats about  $(337 + 304 + 257 + 304)$  1,222 tonnes of DM per year.

Which crops do you grow to provide that? There are a number of different crop choices. Table 1 shows averages of some of our plots from over the years. As the table shows, the best crop to grow for TDN is corn, and the best

*continued on page 12*

Table 1. Average Yields and Qualities of Feed Crops under Irrigation

	Corn	Barley	Oats	Triticale	Alfalfa (2 cut)	Alfalfa (3 cut)
Yield (65%M, t/a)	16	12	12	10	11	11
TDN (%DM)	70%	63%	52%	52%	40%	63%
CP (%DM)	8%	13%	12%	12%	15%	22%



Canada-Saskatchewan  
Irrigation  
Diversification  
Centre

## IRRIGATION FIELD DAY AND TRADE SHOW THURSDAY, JULY 8, 2004 CSIDC OUTLOOK

### Irrigation: Produce to Process

Spend a day with other farmers, researchers and industry representatives viewing and discussing alternative high value crops, cropping systems and their processing opportunities.

**EVERYONE WELCOME**

CONCESSION  
OPEN  
featuring  
Saskatchewan-  
grown  
irrigated produce

#### FIELD DAY ACTIVITIES:

9:30 - 10:00	Trade Show opens Coffee and donuts
10:00 - 12:00	Tour
12:00 - 1:30	Concession and Trade Show
1:30 - 3:30	Tour

#### TOUR HIGHLIGHTS:

##### Special Crops

###### Potato:

- New improved varieties
- Seed, table and processing potato research

###### Vegetables:

- Higher value veggies
- Season extension technology

###### Medicinal plants:

- Commercial scale practices for medicinal plants
- Labour-saving agronomic practices

###### Fruit:

- Improved practices for native fruit
- Irrigated strawberry crown production

###### Trickle Irrigation:

- Water savings and yield increases

##### Field Crops

###### Dry bean:

- New cultivars/market classes
- Nitrogen management for different bean plant types
- Timing of nitrogen application

###### Field peas:

- Improved peas for irrigated production

###### Industry Sponsored Variety Evaluation:

- New improved canola, pea, flax, and wheat germplasm for irrigated production



Canada

Saskatchewan



**Tour Highlights continued:**

Corn:

- Performance of silage and grain corn for irrigated production
- Herbicide evaluation

Soft wheat:

- Irrigated soft wheat production in Saskatchewan

Forages:

- Timothy crop improvement and management practices
- Evaluation of forage species under irrigated production
- Performance of forage combinations

Sunflower:

- Cultivars for irrigated production

Irrigation Systems:

- State of the art irrigation systems, including solar

**OTHER ATTRACTIONS:**

- Small plot equipment
- Buildings and grounds
- Herb garden
- Xeriscape landscape

**CSIDC - OUR MANDATE**

The Canada-Saskatchewan Irrigation Diversification Centre's mandate is to help maintain a viable agricultural industry, to support a sound rural economy, and to preserve a healthy environment.

To achieve these goals, CSIDC conducts, funds, and facilitates irrigated research and demonstration to support industry needs.

**FIELD DAY LOCATION:**

Canada-Saskatchewan Irrigation Diversification  
Centre (CSIDC)  
901 McKenzie St. S.  
Outlook, Sask. S0L 2N0  
*(1/4 mile south of Outlook on Highway 15)*

**FOR MORE INFORMATION....**

Phone (306)867-5400

Fax (306)867-9656

Email: csidc@agr.gc.ca





## Using Irrigation to Feed a Large Dairy

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protein crop is three cuts of alfalfa. If you grow alfalfa, you will need less protein in the concentrate; if you grow corn you'll need less energy in it.

Using the table, corn produces about 16 tonnes/acre of silage; for a 135 acre quarter section pivot, that is about 685 tonnes of DM. With 15% harvest and storage waste, just over two pivots of corn should provide the forage DM required to feed a 300 cow dairy herd for a year. Using just corn silage in the diet would decrease the amount of grain required in the concentrate, although it would significantly increase the protein supplement. There are other nutritional reasons why you might want corn silage in the diet as well.

Barley silage has more protein than corn does, although a bit lower yield. With barley yielding about 12 tonnes/acre, a pivot would produce 437 tonnes of DM. So it would take about 2.8 pivots of barley silage to provide all the forage requirements. You would also save some protein supplement, but require slightly more grain to make up the TDN. Barley is also quite easy to grow and will grow on some poorer land than corn will.

Oats yield approximately the same as barley, although it has less TDN. Barley or corn silage can have a bit too much TDN for a dry cow ration, which would be the only reason you would grow oats instead. Triticale yields less, with similar quality to barley.

Alfalfa produces 11 tonnes/acre of silage and can be cut in either two cuts or three cuts. We have found you get approximately the same yield with either two or three cuts, although a three



*Dairy cows feeding on irrigated forage north of Saskatoon.*

cut system with alfalfa will decrease its persistence. If you cut it three times you can get a TDN approximately that of barley but with quite a bit more protein. You also have to include a year of lower production for establishment. A pivot of alfalfa would produce about 471 tonnes DM, and it would take about three pivots to provide the forage for a 300 cow dairy herd for a year.

The amount of grain required depends a lot on the forage you grew. Since protein supplements are currently quite expensive, let's assume you grew alfalfa and cut it three times. A typical first trimester ration would include about eight kg DM of barley grain, and three kg DM of wheat. Using these numbers, this would require 732 tonnes DM of barley, and 275 tonnes DM of wheat over the 305 day lactating period. (This would be an overestimation, since the amount of grain would decrease in the second and third trimester rations.) A quarter section pivot of barley produces about 90 bu./ac. or about 264 tonnes DM, and a quarter section pivot of wheat produces about 70 bu./ac. or about 240 tonnes DM. For this ration, you would need another 2.75 pivots of barley for grain, and 1.1 pivots of wheat for grain.

You could feed a 300 cow dairy herd for a year on three pivots of alfalfa, 2.75 pivots of barley grain, and just over one pivot of wheat. Two sections of irrigation should provide the land base to support a 300 cow dairy herd.

In the end, there are many other factors that have to be looked at when formulating a ration. When you have the feed in the silo, the best advice is to send samples for analysis and consult a nutritionist for the optimum dairy ration.

# Moisture Testing Feeds – Why is it Important?

By Amanda Walker, ICDC 2003 Coop Student

Most producers are well aware of the value of running feed tests. They provide us with information about the level of calcium, phosphorus, crude protein, fiber, nitrates, and total digestible nutrients (TDN), for example. A feed test also reports the moisture level of the feed. With all of the other sophisticated tests and analyses that can be run on a feed sample, why worry about moisture? In fact, knowing the moisture content of feeds is important for several reasons, such as proper ration formulation, safe storage, and adjusting the price of feeds based on the moisture content.

Those involved in the growing, purchasing or selling of hay or silage should be familiar with common terms used when discussing forage moisture.

**Per cent moisture:** as reported in a feed test indicates the proportion of water in the sample, and is calculated by weighing the sample before and after complete drying.

$$\% \text{ Moisture} = \frac{\text{Dry sample weight}}{\text{Wet sample weight}} \times 100$$

**Per cent dry matter:** is simply everything that is *not* moisture, therefore:

$$\% \text{ Dry Matter} = 100 - \% \text{ Moisture}$$

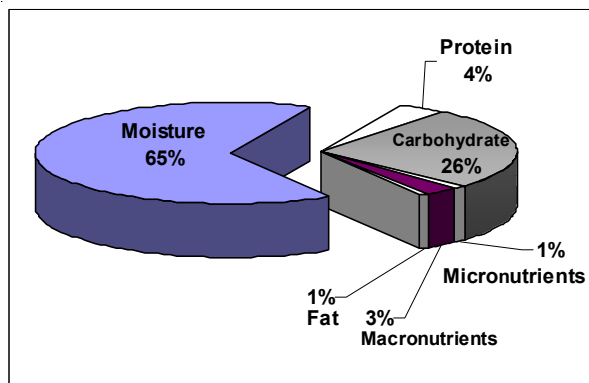


Figure 1. Composition of silage on As-Fed basis.

**As-Fed basis:** refers to feed as it is fed to livestock. That is, it will include the natural moisture of the feed. This moisture level will vary depending on the type of feed. For example, silage on an As-Fed basis may be 60-65% moisture, while barley grain will likely be 10-12% moisture As-Fed.

**Dry Matter (DM) basis:** refers to the nutrient content of a feed, assuming it is 100% dry matter (i.e. without moisture). Feeds do not exist at 100% DM in their natural state, but this can be determined by artificially drying with heat or forced air. DM basis allows different feeds to be compared on an equal, moisture-free basis.

Converting from As-Fed to DM can be done by using the following equations:

$$\% \text{ Nutrient (As Fed)} = \% \text{ Nutrient (DM)} \times (\% \text{ DM of feed} / 100)$$

$$\% \text{ Nutrient (DM)} = \% \text{ Nutrient (As Fed)} / (\% \text{ DM of feed} / 100)$$

**Example:** A feed test reports that a sample of corn silage contains 8% crude protein on a DM basis. What is the per cent crude protein on an As-Fed basis, assuming that the silage contains 65% moisture (35% DM)?

$$\begin{aligned} &\% \text{ Nutrient As Fed basis} \\ &= \% \text{ Nutrient DM} * (\% \text{ DM of feed} / 100) \\ &= 8\% \text{ protein} * (35\% \text{ DM} / 100) \\ &= 2.8\% \text{ protein (As Fed basis)} \end{aligned}$$

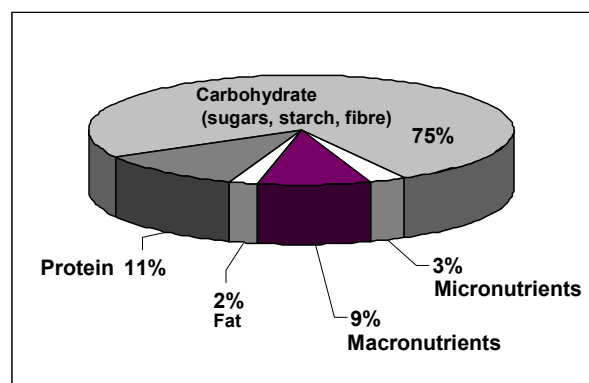


Figure 2. Composition of silage on Dry Matter (DM) basis.

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Willie Watson, Maple Creek, silaging irrigated winter cereals.

## Moisture Testing Feeds - con't

### Storage

Proper storage of feedstuffs requires knowledge of the moisture content. For example, alfalfa hay baled at 20-25% moisture will likely heat and spoil. Silage at 75% moisture is too wet and can seep, while 50% moisture silage is too dry, will be difficult to pack, and is prone to heat damage and molds. Knowing the moisture content of forage at the time of harvest is essential for making high quality hay and silage.

### Ration Formulation

Livestock rations are formulated on a DM basis. However, they must be converted from the DM basis to an As Fed basis for on farm use.

Different feeds have different moisture content; therefore, the ratio of feeds will change between the DM and As Fed ration. For example, the percentage of corn silage required in a feed ration may change from 80% in the dry ration to 90% in the As Fed formulation. It is important to note that these two formulas will contain exactly the same amount of nutrients – the only difference is the moisture content. Your livestock nutritionist can assist you with these formulations and conversions.

Correct ration formulation is important both economically and nutritionally, allowing producers to reduce feed wastage and save money, while at the same time providing their livestock with a ration that meets nutritional needs for maintenance, growth, or lactation.

### Pricing Feeds

Since feeds are most often bought and sold by weight, the moisture content must be considered in order to avoid over or under pricing of feeds. Being able to adjust the price of feeds according

to moisture content allows producers and buyers to get the best value for their money and avoid paying for water. The following formula can be used to adjust the price of feeds in order to evaluate them on a standard moisture basis.

$$\text{Value of Feed (\$)} = \frac{\text{Actual DM \% of Feed} \times \text{Price}}{\text{Desired DM \%}}$$

**Example 1:** The market value for alfalfa hay is \$75/tonne at 15% moisture. If you have hay at 10% moisture, what is the value per ton?

$$\begin{aligned} \text{Value of Hay} &= \frac{(100 - 10\% \text{ moisture}) \times \$75/\text{tonne}}{(100 - 15\% \text{ moisture})} \\ &= \frac{90\% \text{ DM} \times \$75/\text{tonne}}{85\% \text{ DM}} \\ &= \$79.41/\text{tonne} \end{aligned}$$

**Example 2:** A feedlot in your area is buying corn silage for \$25/tonne on a 65% moisture (35% DM) basis. What is the appropriate price per ton for silage at 60% moisture (40% DM) and 68% moisture (32% DM)?

#### Value of silage @ 70% moisture:

$$\begin{aligned} \text{Value} &= \frac{\text{Actual DM \% of silage} \times \text{quoted price}}{\text{Desired DM\%}} \\ &= \frac{32\% \text{ DM} \times \$25/\text{tonne}}{35\% \text{ DM}} \\ &= \$22.86/\text{tonne @ 68\% moisture} \end{aligned}$$

#### Value of silage @ 60% moisture:

$$\begin{aligned} \text{Value} &= \frac{\text{Actual DM\% of silage} \times \text{quoted price}}{\text{Desired DM\%}} \\ &= \frac{40\% \text{ DM} \times \$25/\text{tonne}}{35\% \text{ DM}} \\ &= \$28.57/\text{tonne @ 60\% moisture} \end{aligned}$$

As this example illustrates, the value of a feed varies according to the moisture content. Without price adjustment, the producer would be underpaid by \$2.85/ton if he was delivering silage at only 60% moisture. On the other hand, if the producer was delivering 68% moisture silage, the feedlot would be paying for extra water. For this reason, there is and should be a premium for feeds at a lower moisture content in order to avoid buying water.

Knowing the moisture, or DM, content of feeds and being able to adjust for variations in moisture content is a valuable tool for every producer. Being familiar with how and when to use these calculations can help producers to make informed and economical decisions about their forage purchases and sales.



## 2004 ICDC Program

*continued from page 3*

CSIDC hosts variety trials for perennial and annual forage purposes. Terry Hogg has extended the 2004 barley, oats and triticale cereal forage testing to CSIDC and the ICDC site at SPARC. Dr. Grant McLeod is again studying ryegrass and winter cereals establishment using cereal silage cover crops on the ICDC site at SPARC. Dr. Bruce Coulman's timothy research on seeding rate and timing will be managed by Sarah Sommerfeld. ICDC is harvesting timothy for three years at CSIDC to determine optimum annual phosphorus placement. At Swift Current, Jeff Wiebe demonstrates the field scale irrigation performance of seven new alfalfas.

CSIDC hosts the Alberta Corn Committee's research, including a 40 silage and eight grain corn variety trial and a Plant Science 15 sweet corn selection. Minor use registration tests for Liberty Link corn are hosted at CSIDC and the ICDC site at SPARC. Field testing in cooperation with the corn industry is planned in other Irrigation Districts.

ICDC is again participating in a cross-Canada research trial evaluating new bean varieties with resistance to common bacterial blight. CSIDC



*Producers check out irrigated grass plots at last year's CSIDC Field Day.*

hosts this project that is supported by pulse growers from Ontario to Alberta. ICDC is studying the local experience of irrigators in commercial dry bean and seed production for new technology and processing. Crop protection from disease and pests will again emphasize fusarium and pocket gopher management.

ICDC has committed \$44,000 to the field work and production of the 2005 Crop Varieties for Irrigation, and in April 2004 released the new Irrigation Economics and Agronomics for Saskatchewan. The ICDC/SIPA Web site [www.irrigationsaskatchewan.com](http://www.irrigationsaskatchewan.com) continues to receive numerous updates. The March 6th irrigation seminar series renewed contact with over 120 irrigators. A list of this summer's planned events appears in this newsletter.

## Coming events: Irrigation 2004 Summer Program

- **Friday, June 25<sup>th</sup>**, Saskatchewan Vegetable Growers' Assoc. Annual Field Day at CSIDC and the South Saskatchewan River Irrigation District. Members meet at CSIDC about 8:00 a.m. and Oliver Green guides the tour leaving at 10:30 a.m. Register with Elaine Waldner, ph. 934-1458, fax 975-2009.
- **Saturday, June 26<sup>th</sup>**, Saskatchewan Fruit Growers Association Summer Tour at CSIDC, includes Bill and Jean King's JWD Market Garden. Tour begins at 10:00 a.m. with guides Clarence Peters and Dr. Bob Bors. Register by phone 306-645-4447 or E-mail: [cas.lyn@sasktel.net](mailto:cas.lyn@sasktel.net)
- **Thursday, July 8<sup>th</sup>**, Annual CSIDC Field Day and Trade Show at Outlook. See pages 10 and 11 for details.
- **Tuesday, July 13<sup>th</sup>**, Treasure Valley Market's Irrigated Market Garden and Fruit Crop Evening Field Day, eight miles North of Cadillac. Clarence Peters, Andrew Sullivan and Dr. Bob Bors will tour and discuss horticultural business opportunities. Contact Les Bohrsen, ph. 778-5043.
- **Monday, July 19<sup>th</sup>**, ICDC Dairy Quality Silage and Forage Evening Tour, four miles east of Osler, in cooperation SeCan, the U of S. College of Agriculture, and SAFRR. Contact Korvin Olfert, ph. 778-5041.
- **Monday, July 26<sup>th</sup>**, SPARC Irrigated Forage and Grazing Tour at Swift Current in cooperation with SAFRR, SeCan, Wiebe Hay Sales, and the Southwest Forage Association. Contact Korvin Olfert, ph. 778-5041.
- Watch for an Irrigated Crop Performance Field Day at Maple Creek in cooperation with PFRA, SeCan and Saskatchewan Wheat Pool. Contact Les Bohrsen, ph. 778-5043.

*continued on next page*

## Calendar of Events

*continued from page 15*

- Watch for a Saskatchewan timothy event in cooperation with the Canadian Hay Association and ICDC. Contact Korvin Olfert, ph. 778-5041.
- **Thursday, August 5<sup>th</sup>**, ICDC Bean and Soybean Performance, and Pulse Pedigree Seed Field Day will offer both research and demonstration in cooperation with CSIDC, SAFRR and the Crop Development Centre, U of S. Contact Clint Ringdal, ph. 867-5411.
- **Thursday, August 12<sup>th</sup>**, Saskatchewan Seed Potato Growers Association Field day starts at CSIDC. Register with Connie Achtymichuk, ph. 306-867-2078, fax 306-867-2102, or E-mail: [sspga@sasktel.net](mailto:sspga@sasktel.net)
- **Tuesday, September 14<sup>th</sup>**, ICDC Saskatchewan Corn Performance, Nutrition, and Super Sweet Corn Field Day at Outlook in cooperation with CSIDC, SAFRR and the Alberta Corn Committee. In cooperation with the corn industry and irrigated corn growers, additional Corn Silage and Grazing Field Days will be scheduled in late summer and fall. Contact Les Bohrsen, ph. 778-5043.

## Irrigation contacts in Saskatchewan

### Web sites

ICDC/SIPA - [www.irrigationsaskatchewan.com](http://www.irrigationsaskatchewan.com)

SAFRR - [www.agr.gov.sk.ca](http://www.agr.gov.sk.ca) go to Crops/Irrigation

CSIDC - [www.agr.gc.ca/pfra/csfdc/csfdc.htm](http://www.agr.gc.ca/pfra/csfdc/csfdc.htm)

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