



# Irrigation Advisory Services and Participatory Extension in Irrigation Management

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IRRIGATION ADVISORY SERVICES  
(A CANADIAN MODEL)

by

L.C. Tollefson, D. Tomasiewicz, J. Linsley,  
B. Paterson, and R. Hohm

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## **Irrigation Advisory Services (A Canadian Model)**

**L.C. Tollefson<sup>1</sup>, D. Tomaszewicz<sup>2</sup>, J. Linsley<sup>3</sup>, B. Paterson<sup>4</sup>, R. Hohm<sup>5</sup>**

### **ABSTRACT**

The challenge to research today is to develop economically viable technology that is adaptable to rural society. To be effective, irrigated research must be directed to producer and industry needs. The challenge to advisory services/extension is to deliver this information effectively and to ensure utilization by farm clients. This service is vital to the development of irrigated agriculture. In developed countries, there tends to be a greater commitment to acceptance of new knowledge and the promotion of practices which allow technology to be advanced more rapidly. Historically the extension service was the responsibility of the public sector, but more recently the private sector has become increasingly involved. Increased private sector involvement has often resulted in more rapid acceptance, higher efficiency and increased profitability. The public sector should also be involved, however, to ensure that the service is extended to needy farmers. A blend of the two work well. More recently Agriculture and Agri-Food Canada, PFRA, have worked to encourage partnerships and private sector involvement in irrigated research, demonstration and technology transfer. Today, in co-operation with private industry, federal and provincial governments, irrigation centres are operated at Outlook, Saskatchewan (Canada-Saskatchewan Irrigation Diversification Centre), Carberry, Manitoba (Manitoba Crop Diversification Centre) and Lethbridge, Alberta (Canada Alberta Crop Diversification Initiative).

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<sup>1</sup>Canada-Saskatchewan Irrigation Diversification Centre, Outlook, Saskatchewan, E-Mail: [tollefsonl@em.agr.ca](mailto:tollefsonl@em.agr.ca)

<sup>2</sup>Manitoba Crop Diversification Centre, Carberry, Manitoba

<sup>3</sup>Irrigation Crop Diversification Corporation, Outlook, Saskatchewan

<sup>4</sup>Alberta Agriculture, Food and Rural Development, Lethbridge, Alberta

<sup>5</sup>Alberta Agriculture, Food & Rural Development, Farm Irrigation Management Section, Lethbridge, Alberta

## **INTRODUCTION**

A challenge for researchers today is to develop technology that is adaptable to rural society and is economically viable. This information must be effectively delivered and utilized by rural clients if the maximum benefit is to be gained (Seegers et al., 1990). This information is critical to sustainable irrigation development.

In developed countries there has been a greater commitment to the development, promotion and acceptance of new technology which allows the technology to be advanced more rapidly (Tollefson, 1996). In the past providing information to farmers and farm groups has been the role of government. More recently increased private sector involvement has occurred. In many cases this has resulted in more rapid acceptance, higher efficiency and increased profitability. There is still an important role for the public sector but this is changing. Highly specialized individuals working to train industry representatives rather than individual farmers appears to be the future model. This paper will describe individual provincial advisory services and outline a federal/provincial/industry model being utilized.

## **BACKGROUND**

Irrigation development in Canada is primarily located in western Canada. It is estimated that approximately 2.0 million acres of irrigated land exist (2001 Census of Agriculture) of which 64% is in the province of Alberta, 8.7% Saskatchewan, 14.7% British Columbia and 3.5% in Manitoba. Irrigated acreage in Canada is relatively small compared to the cropped dryland area (2.1%). It does contribute significantly however, in the ability to stabilize and diversify production and contributes greatly to the overall economy. An example is the province of Alberta whereby 20% of the agricultural production comes from 5% of the cultivated land as a result of irrigation (Hill et al., 1996).

Irrigated production in Saskatchewan and Alberta have many similarities since climatically the regions are similar. Irrigation development in Manitoba has been driven by the potato processing industry's need for a quality product and is often considered supplemental. In British Columbia, irrigation is used primarily in the semi arid interior valleys for forage, fruit and higher valued crop production. Differences in climate, acreage, crops grown and government have resulted in different approaches to the extension and advisory services provided to producers. Agricultural Extension Service in Canada is often considered the mandate of the provincial government.

### **Irrigation Advisory Services in Saskatchewan**

#### ***Past***

Irrigation technology transfer grew out of work conducted at the Dominion Experimental Substations and the irrigation Illustration Farms of the 1930's and 40's on the southern prairies. Twenty years prior to the construction of the Gardiner Dam and Lake Diefenbaker, irrigation was demonstrated by the federal government's PFRA at a pre-development farm which opened in 1949 at Outlook, Saskatchewan.

Professional irrigation advice was initially provided by government engineers who were familiar with the design and construction of the irrigation systems. Agricultural economists offered theoretical advice to government on irrigation's feasibility and to farmers on the economics of their irrigated crop options. The government soon hired Professional Agrologists as the irrigation project emphasis shifted from construction to cropping.

The pre-development farm became the PFRA Demonstration Farm once the dam was completed. Its role was to demonstrate various irrigated crop options and their agronomics.

As irrigation expanded, in the 70's and early 80's, irrigation agrologists went on-the-road to hold extension meetings for prospective irrigators throughout the province. They met one-on-one with all new irrigators to advise on crop selection, agronomy, economics and irrigation management and offered a weekly irrigation scheduling service. Irrigation courses of 4-6 weeks duration were offered with government funding assistance.

Irrigation advice during this period typically provided general, basic agronomy to farmers who were adapting from risk-averse, moisture conserving, low technology dryland agriculture to the high-tech world of continuous cropping with unlimited moisture.

Governments were under pressure to get fast adoption to pay back the considerable public infrastructure investment in this irrigation project. The individual farmer was also under severe cash flow constraints as he invested not only in the irrigation system but also in the much higher input costs for the irrigated crops. Grain markets for the traditional dryland crops were very poor at the time. The adoption rate was lower than desired.

The farmer not only had to adapt to irrigation but also to new higher value crops with associated increased cost and risk. Irrigation advice was given by government engineers and agrologists who, though competent and knowledgeable, had little experience. Consequently the problems that arose with the new crops and technology were learned by leading practitioners and advisors together. Production of the crops was one challenge, marketing proved to be a bigger challenge.

### ***Present***

Thirty years after the initial adoption of irrigation in the Lake Diefenbaker Area, agriculture and its advisory needs have changed from basic agronomy on a variety of "traditional" crops to a consulting role to agri-businesses working with irrigators on specific crops.

The private sector is now providing more advisory services directly to producers in most industrialized countries of the world. Their advisory service is usually focussed on specific contracted crops. Producers will readily adopt new crops when supported by a competent field person knowing that a market for the crop exists. The producer learns through the confidence and ability of the field person.

Farms have increased in size and complexity hence individual producers do not have the time nor expertise to examine each field carefully and make the appropriate decisions. They are more willing to hire this advisory service. Private sector consulting is in its infancy on Saskatchewan's irrigated acres.

Irrigators look to government, however, for independent testing to contrast with the vested interests of the private sector. The Canada-Saskatchewan Irrigation Diversification Centre (CSIDC) publishes Crop Varieties for Irrigation in Saskatchewan, popular with producers, to provide unbiased crop varietal results.

Irrigation advisory services in Saskatchewan have been recently delegated by the provincial government to a producer corporation called The Irrigation Crop Diversification Corporation (ICDC). This corporation was established under *The Irrigation Act 1996*. ICDC is accountable to irrigators through a

democratic process outlined in its bylaws. Sask Water, a provincial government agency, seconded its government advisory service agrologists to ICDC. Sask Water also provides ICDC's administration needs.

ICDC signed a partnership agreement in 1998 with the federal and provincial governments that places ICDC as one of three co-chairs of CSIDC located at Outlook, SK (Business Plan CSIDC 2002). CSIDC is a world class Federal/Provincial/Industry irrigation R&D facility.

ICDC assisted in the development of an irrigation strategy for CSIDC by bringing the priorities of the irrigation districts to the session (Challenge & Opportunity - A New Era in Irrigation Research and Demonstration in Saskatchewan, 1998).

ICDC currently operates a province-wide irrigation demonstration program which involves

- a minimum of five sites and cooperators
- a commitment fee from the cooperator
- paying out a maximum of \$500 per demo per site to contribute towards extra crop inputs
- a field scouting service to ensure that the demos are properly managed

Advice flows from ICDC's cooperators, the leading edge irrigators, and from the ICDC Agrologists through word-of-mouth, crop clubs, research and demo reports, meetings, newsletter (*The Irrigator*) and website: <http://www.irrigationsaskatchewan.com>.

### ***Future***

Saskatchewan is in an era of limited government funding, environmental priorities and low farm commodity prices. Irrigation is sometimes viewed skeptically due to cost, environmental concerns, etc.

Saskatchewan presently consumes only 3.5% of the mean annual inflow into Lake Diefenbaker for irrigation. It has developed less than 30% of the originally planned irrigated acreage. Much potential does exist.

Saskatchewan is experiencing an immigration of expertise from areas where land and water is scarce and highly priced. It is experiencing a rapid increase in higher valued crop production and in the management ability of its irrigators as their profit margins are squeezed. The question is how will Saskatchewan's advisory services adapt to these changes?

Government/Agri-business/Irrigator partnerships will likely continue to be the basis for generating information. Partnerships are usually typified by complex administration, short term planning and a constant search for funding.

Producers will continue to need effective representation through their commodity groups. Commodity groups will form partnerships between themselves. An increasing number of producer "clubs", focussing on particular commodities, will evolve.

Advisory services will increasingly be supplied by the private sector and the role of government will decrease. Government's involvement will continue where the "critical mass" for private sector services does not exist. ICDC is a transition model whereby government supports a producer organization until a

“critical mass” develops to support it privately. ICDC is not an agent of the Crown, hence is involved with lobbying government on irrigation R&D issues.

### **Irrigation Advisory Services in Manitoba**

Agricultural irrigation in Manitoba is driven primarily by the french-fry processing industry, which accounts for 90% of the province’s potato acreage. Eighty percent of Manitoba’s 28,000 ha of irrigation for agricultural production is for potatoes (all figures based on data from the 2001 season). Moisture deficits for cereals, oilseeds, and pulse crops are low in Manitoba - these crops account for only 10% of the irrigated acreage. Even for potatoes, the average annual irrigation amount is only approximately 9 cm.

Supplemental irrigation is seen as one of the practices required for reliable production of potatoes and other high-value crops, rather than as the basis itself for a different alternative type of farming enterprise. Most irrigation systems are moved each year to follow the potatoes in the crop rotation.

The dominance of the french-fry processing industry, with currently only two processing plants in Manitoba and a third under construction, affects the way irrigation information is transferred to growers. Processing potatoes are grown under contracts that usually require that growers be able to irrigate their crop. The processors field and agronomic staff maintain regular contact with producers, advising in all production and storage matters, including irrigation. Irrigation management decisions during the growing season are the grower’s responsibility. Irrigators using soil moisture sensing devices, or even daily evapotranspiration estimates, to schedule irrigations are still in the minority, but their numbers are increasing.

No industry or government extension or research staff in Manitoba are dedicated wholly to irrigation management and/or development. The Government of Manitoba (Manitoba Agriculture and Food) provides extension services to producers in the area of crop production, and employs a Potato Specialist and Agrometeorologist. These, and other technology transfer specialists to a lesser extent, provide irrigation advice. Research staff with Agriculture and Agri-Food Canada (Research Branch), the University of Manitoba, the Manitoba Crop Diversification Centre, and industry have included studies of crop water use and irrigation management in their programs. Potato industry agronomists work closely with them to develop and extend results of their findings to growers, and to provide feedback to researchers regarding industry needs. They also draw on their corporate affiliations, and on national/international colleagues, to source information for their contract growers.

Irrigation development in Manitoba has been driven primarily by industry needs and producer investment, rather than large public-sector initiatives. Soil/water/environment resource staff, engineers, and others with the Prairie Farm Rehabilitation Administration Branch of Agriculture and Agri-Food Canada, and with the Government of Manitoba, have played an active role guiding this development. Continued expansion of irrigation in the Province, and related environmental issues, may lead to more demand for staff dedicated specifically to irrigation management and development.

## **Irrigation Advisory Services in Alberta**

The province of Alberta has the largest irrigated acreage, number of clients to serve and longest history of irrigation.

The Alberta model in many regards is similar to that of Saskatchewan. In past years the government of Alberta was very involved with individual irrigators providing a consultative service to them. This model has been changing and gradually the government of Alberta extension service of which Irrigation Advisory Services are located is being privatized.

Alberta Agriculture now offers a training program that is focussed on training the trainer. This training is offered to Industry and commodity groups rather than individual farmers. Agricore United, Cargill, AgPro, fertilizer companies, etc. are examples of companies who have been provided training. Once trained, their field staff will work with individual farmers on a fee for service basis. Alberta Agriculture has also developed an Albert Irrigation Management Model (AIMM) designed specifically for Alberta's climactic conditions. Training in the use of this model has been directed towards highly advanced producers and industry groups. In support of this model, an extensive meteorological weather station network is maintained by Alberta Agriculture throughout the irrigated area. Information from the weather stations is made available, by downloading from the internet, to users of the AIMM.

In Alberta, training is provided by very specialized individuals to high profile industry groups. General government extensionists working with individual farmers do not exist today. Much of this responsibility has been assumed by the private sector. This transition has been driven by Industry. They now have trained field staff available to work with individual farmers and question why government would offer a similar service.

The Irrigation Advisory Services and training provided by Alberta Agriculture are now on a fee for service basis. All publications are costed. There was surprisingly little objection from the client groups when fee for service information was introduced.

A good website now exists with information available to the general public. In addition a call centre was established where any individual can phone in and the question will be directed to the appropriate specialist. This individual may be located anywhere in the province.

Clearly the model for future advisory services in Alberta is one that is privatized. It has been moving in that direction for some time. It is hard to gauge the overall success simply because it is a relatively new service.

## **Federal/Provincial/Industry Model**

Agriculture and Agri-Food Canada, PFRA more recently has been a leader in encouraging partnerships and private sector involvement in irrigated research, demonstration and technology transfer. The emphasis is on rural development and environmental sustainability. Today in co-operation with private industry and provincial governments, PFRA successfully operates irrigated research and demonstration centres at Outlook, Saskatchewan, Carberry, Manitoba and Lethbridge, Alberta. The Canada-Saskatchewan Irrigation Diversification Centre (CSIDC) is one component of a developing Western Canadian initiative in irrigation research and demonstration. CSIDC is the longest standing centre with its origins dating back to 1949. The Manitoba Crop Diversification Centre (MCDC) was formed in 1994

and the Canada-Alberta Crop Diversification Initiative (CACDI) in 2000.

### ***CSIDC***

CSIDC was formed from an MOU signed in 1998. The MOU included Canada represented by Agriculture & Agri-Food Canada, PFRA, Saskatchewan through Sask Water and Industry through the Saskatchewan Irrigation Projects Association (SIPA) and the Irrigation Crop Diversification Corporation (ICDC). All four groups are members of the Centre's Executive Management Committee.

The purpose of the MOU was to enable Canada, Saskatchewan, SIPA and ICDC to provide a framework whereby irrigated R, D & E can be conducted and facilitated and results extended in support of irrigated agriculture and diversification. The partners have developed a detailed Strategic Plan and Business Plan.

### ***MCDC***

The MCDC is a three way partnership like CSIDC between an industry consortium called MHPEC Inc. and the government of Canada and Manitoba.

The purpose was to enable Canada, Manitoba and MHPEC to provide funding for the development of a Centre through which crop diversification and production enhancing technologies could be investigated and demonstrated for the benefit of agriculture in Manitoba. Much of the work at this Centre has focussed on support to the potato industry. Extension is an important focus.

### ***CACDI***

The province of Alberta has the largest irrigated acreage in Canada. A partnership is being formulated with two levels of government and industry represented at the management table. This facility complements existing R & D programs in Alberta by bridging the gap between plot scale research and field production. The facility promotes new irrigation technology.

### **CONCLUSION**

Irrigation advisory services in Canada are located primarily in western Canada. They have evolved from a public service working with individual farmers to a more privatized model whereby industry plays a much more proactive role in providing the information. These services have changed and will continue to evolve in response to the changing business and political environment. Forward thinking will be required to keep this service relevant.

More recently a federal/provincial/industry approach has successfully been used to promote irrigated research, demonstration and technology transfer at CSIDC, MCDC and CACDI. This approach is designed to ensure a co-ordinated effort of the parties involved within the individual provinces and across western Canada.

### Authors

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