

## Places for people, pike, and pelicans



*A windsurfer catches the breeze on Keho Reservoir.*

Alberta's irrigation systems provide water to 80 different streams, lakes and reservoirs, offering a wealth of family recreational opportunities. In the hot, dry prairie summers, residents and visitors can fish, boat, swim, windsurf, waterski, camp and observe wildlife. In winter, irrigation reservoirs are popular for ice fishing.

The St. Mary Reservoir, a 116,000 hectare lake, supports a complete range of outdoor activities. Badger Lake, Enchant Pond, and Dead Horse Coulee in the Bow River Irrigation District are among the reservoirs known for good fishing. Kinbrook Island Provincial Park, on Lake Newell Reservoir, has excellent sailing and birdwatching. Cottage resorts have been developed on some irrigation reservoirs, and many municipalities use irrigation water for swimming pools, golf courses, parks and playgrounds. Rehabilitation programs and fish stocking have greatly enhanced the recreational potential of many irrigation sites.



*At the St. Mary Reservoir, families enjoy boating, picnicking, fishing and water play, both above and below the dam. Deer, cormorants, mergansers, terns, pelicans, and swallows frequent the area and raise their young along the waterways. The dam's spillway is also home to a colony of yellow-bellied marmots.*



Wetland protection has become part of the environmental mandate of almost all the irrigation districts. For example, in the Eastern Irrigation District (EID) near Brooks, an abandoned irrigation canal is providing wetland habitat for a variety of wildlife. The original irrigation canal, built in 1915, made a loop around a small, lowland area, located on property now owned by Lakeside Farm Industries. The area became too wet to farm, but over the years, seepage had created a 16-hectare cattail and willow marsh, which provided habitat for deer, small mammals, and thousands of birds, including a winter population of pheasants.

When a new pipeline was installed, Lakeside agreed to leave the old wetland in place, instead of backfilling it. A

service line from the new pipeline was installed to bring a regular supply of water to the marsh, thus maintaining water levels, habitat and the wildlife population.

The Lakeside Industries marsh is only one example of the larger *Partners in Habitat Development* program, a partnership between private landowners and the EID. More than 70 irrigation farmers are now involved in the program. Other partners include Alberta Agriculture, Food and Rural Development, the Prairie Farm Rehabilitation Administration, Ducks Unlimited, Alberta Natural Resources Service, the County of Newell, Pheasants Forever, and the Brooks Fish and Game Association.

The recreational benefits of irrigation accrue not only to people who live near reservoirs, but also to urbanites. For example, most of the 30,000 people who visit irrigation-based Park Lake each summer come from the Lethbridge area. Water levels at Chestermere Lake, a popular resort east of Calgary, are also maintained through irrigation.

In addition to the pleasure and exercise afforded by these water bodies, irrigation-based recreational activities add over \$2 million a year to the economy. Multiplier effects include increased land values and a better economic and social atmosphere in rural communities.

The irrigation industry has also won the Emerald Award, the Blue Heron Award, and other citations for its environmental efforts in the last few years. About 32,000 hectares of wetlands have been created or enhanced by the irrigation industry. Such wetlands are home to both rare

and common wildlife species, including burrowing owls, pelicans, ducks and geese, toads, pike, foxes and deer.

The Pine Coulee project, for example, has enhanced the sport fishery in the reservoir and created new wildlife habitat on Willow Creek. At Keenex Coulee, in the Lethbridge Northern Irrigation District, Ducks Unlimited and the LNID have restored habitat for waterfowl, shorebirds, hawks, mink and muskrat.

The Taber Irrigation District has also worked with Ducks Unlimited to enhance the waterfowl productivity of Fincastle Marsh, northwest of the hamlet of Purple Springs. Breeding populations of at least ten species of ducks, as well as geese, sharp-tailed grouse and other wildlife, have benefited from the stabilization of water levels. Bulrushes, reeds and other marsh plants provide habitat and food.



## Meeting environmental challenges

Just as farmers, government and the irrigation industry are restoring and enhancing wetlands for wildlife, they are also responding to other environmental challenges, particularly with regard to water, soil and air quality.

Initiated in 1992 as a joint federal and provincial government program, the Canada-Alberta Environmentally Sustainable Agriculture (CAESA) agreement has been fundamental in driving the on-going monitoring of Alberta's water quality. The CAESA Agreement, in which the Irrigation Branch had a pivotal role, sought to improve resource management and the growth of the agri-food industry by promoting environmentally sound practices in both primary and secondary agricultural production.

The five-year study did baseline water quality monitoring on surface waters, groundwater and farmstead water supplies, and conducted research to assess the potential for agriculture to impact water quality. The impacts of irrigated agriculture were a major focus of the study.

Different projects reviewed water quality data from more than 40 different irrigated agricultural sites in southern Alberta, conducted research on nitrate levels and herbicide concentrations in soils under irrigated fields, and studied the effects of different manure and nutrient management practices on water and soil quality.

In general, the CAESA study found that some agricultural practices were contributing to the degradation of water quality, and levels of nutrients and bacteria in surface and shallow groundwaters sometimes exceeded water quality guidelines, particularly in intensive agricultural areas.

Information gained from the study was given to the industry and the public in a comprehensive report published in 1998. The report has provided a database for the on-going monitoring and assessment of the province's lakes and streams and a starting point for projects and practices aimed at improving environmental stewardship.

The Alberta Environmentally Sustainable Agriculture (AESA) Program was developed by the provincial government to continue the work begun under CAESA. The program is a partnership between the provincial government and industry stakeholders. It emphasizes the transfer of information and technology to farmers, ranchers and processors, and the reduction of agricultural processing inputs through more efficient use and recycling.

The AESA program has four main components:

- A farm-based component to encourage better management practices by farmers and ranchers involved in primary production;
- A processing-based component to promote the development and adoption of more sustainable manufacturing practices in the agricultural processing sector;
- A resource monitoring component to record and quantify changes in soil and water quality in the province, especially as affected by agriculture; and
- A research component to develop more sustainable management practices and technologies through integrated studies of water, soil, air and biodiversity.

Water quality in 23 small streams is being monitored and 41 benchmark sites have been established for on-going soil quality monitoring and assessment. The research component includes studies of how nitrates move from manured fields to streams. Of particular importance are watershed-based, integrated studies in irrigated agricultural areas in southern Alberta.

The Crowfoot Creek watershed study, for example, identified land uses that contribute to water quality deterioration in this small Bow River tributary basin in the Western Irrigation District. A grassroots, multi-stakeholder partnership has been formed, and has been instrumental in initiating better agricultural practices in the watershed, particularly in regard to improving the quality of irrigation return water to the stream. Changes include the building of a diversion to redirect runoff from a cattle-wintering site away from the creek, the construction of a fence to keep cattle from trampling the riparian areas along the creek, and redesignation of a 20-hectare field from crop to pasture land to reduce runoff in non-crop seasons.

Similar watershed-based work is being done by the Oldman River Basin Water Quality Initiative. The initiative brings together irrigation farmers and the irrigation industry, intensive livestock operators, health officials, environmental activists, and municipal, provincial and federal government agencies. The group has identified both urban and rural practices that impact water quality and is working to understand the problems and to implement changes that will lead to improvements.



### **On-going Irrigation Research Challenges**

**Crop research:** Work on optimal water applications for a diversity of crops was started in the 1960s and continues on new crops and crop varieties. For example, research on alfalfa under different water management regimes show yield increases of up to 60% are possible. New perennial cereal varieties are being developed that will be able to take advantage of more abundant early spring moisture, reduce production costs and perhaps yield a second crop.

**On-Farm Irrigation System Efficiencies:** Intensive field testing of centre pivot sprinkler systems has been conducted by irrigation equipment dealers and both levels of government. For example, research shows drop tube applicators, combined with low-pressure pumping are more efficient, with less loss of irrigation water to evaporation and wind-drift. Research also led to the development of surge irrigation techniques for flood irrigated fields.

**Tillage and Soil Management Practices:** Zero-till and low tillage soil management techniques help conserve moisture, lowering crop water needs and improving water infiltration.

## **Breaking new ground**

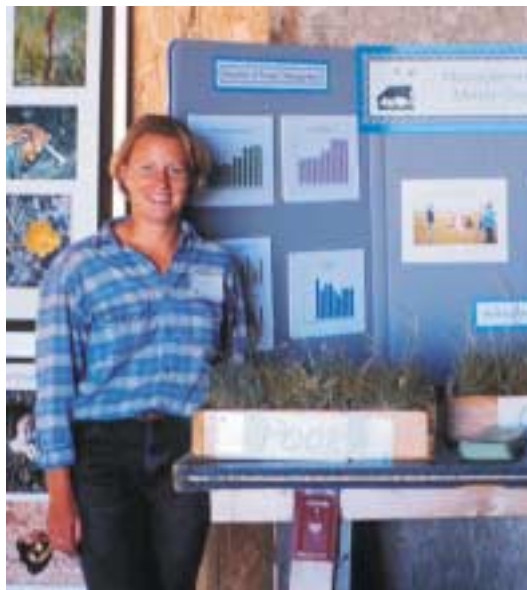
Just as the past 50 years have seen major improvements in irrigation farming, so there will be changes and opportunities in the future. Water allocation, environmental concerns, research on crop improvements, and the adoption of new technologies and better management practices will continue to challenge the irrigation industry in Alberta. But most experts predict the greatest changes will occur in producer's attitudes to the ways they farm and their role in the new global economy.

Alberta's goal for its agricultural industry is a \$20-billion dollar value-added sector and \$10 billion in primary farm production. The goal recognizes that the world has become more competitive and that changes are taking place at a faster rate, but believes the agricultural sector, particularly in irrigated areas, will continue to respond through innovation, education and farm management changes.

Many of these changes are already taking place. Farm diversification has been around a long time and many producers are finding guaranteed markets for their crops before growing them. Some producers are specifically marketing their farm's products to a more health and safety conscious public, viewing consumers' concerns about what

they eat as an opportunity rather than a threat. The following paragraphs briefly describe some of the trends that can be expected to continue or accelerate, and some of the ways the irrigation industry is responding.

- Irrigated farming will become more processing oriented, with producers growing crops they can add value to on their own farms or in conjunction with other farmers. *Small fruit growers are not only growing the berries, they're producing jams and syrups to sell under their own brand name.*
- Alberta farmers will continue to find niche markets in which they can compete successfully. *Several southern Alberta irrigation farmers are supplying restaurants and high-end grocers with organically-grown and baby vegetables.*
- Producers will negotiate global sales to move higher quality traditional crops or special crops. *Expanded Japanese markets have been found by many Alberta irrigators for high quality timothy. Pulse farmers are marketing their crops overseas, either individually or in small-grower consortia.*



*Soil sampling and farm extension programs, including field demonstrations, are some of the ways irrigation farmers and the industry are responding to the challenges of the future.*

- Producers will negotiate long-term contracts with processors to supply specific crop varieties. *Potato growers in southern Alberta plant their irrigated crops under contract to a number of local french fry and chip processing plants.*
- Producers will band together to increase supplies of specialized products, thus finding more assured and more profitable markets. *A group of southwestern Alberta organic beef producers formed a consortium to meet the quantity and quality requirements of their overseas markets. A chickpea packaging plant has been built by a group of southern Alberta farmers, so they can take better marketing advantage of the price and rotational benefits of the crop.*
- Government will support the agricultural industry more than specific producers. Funding for research and development, infrastructure upgrades and education will continue, but farmer subsidies will likely decrease. *The Alberta government funded a new chair for environmentally sustainable agriculture at the University of Alberta in 2000. The Canada-Alberta Crop Development Initiative will conduct and demonstrate field scale testing of new irrigation techniques and crop varieties.*
- Education programs and training courses will become more important as changes in technology and management practices accelerate. *About half of Alberta's farmers now attend seminars and demonstrations, or take courses on a regular basis. The Alberta government has added an agricultural program, including a course on irrigated farming, to the high school curriculum.*
- Computerization, on-farm data collection and analyses, and more business-like approaches to farm management will be needed to succeed. *About half of Alberta's irrigation farmers now use computers regularly to record and analyse seeding rates, swathing times, feed variations and other aspects of raising crops and livestock. Almost half of Alberta farmers are using computers to access the Internet and to study such things as crop marketing alternatives.*
- The agricultural industry will become increasingly pro-active in fostering and initiating sustainable agricultural practices. *Alberta's irrigation districts are automating control of the canal systems to increase the water use efficiency of the system.*
- Consumers and businesses will increasingly look for humanely-raised livestock and organic and environmentally-friendly products. Farm producers will meet those needs. *Alberta grain farmers are now growing crops specifically designed for the production of ethanol as a gasoline additive and replacement. Oilseeds are being processed as lubricants and are replacing animal-derived oils in cosmetics, plastics and other consumer and industrial products.*



# For more information...

## Organizations

**Irrigation Branch**, Alberta Agriculture, Food and Rural Development, (AAFRD) is the provincial agency with responsibility for irrigation. Located at the Lethbridge Research Centre, they have district offices at Strathmore, Brooks, Medicine Hat, Bow Island, and Taber. Phone: (403) 381-5140.

**Agriculture and Agri-Food Canada (AAFC)** conducts agricultural research to improve the competitiveness of the Canadian agricultural industry. They have several locations, including the Lethbridge Research Centre, Phone: (403) 327-4561.

**Alberta Irrigation Projects Association (AIPA)** represents the 13 irrigation districts. Located at 909 Lethbridge Centre Tower, 400 - 4th Avenue S., Lethbridge, Alberta T1J 4E1. Phone: (403) 328-3063.

**Prairie Farm Rehabilitation Administration (PFRA)**, a department of Agriculture and Agri-Food Canada, promotes soil and water conservation, and good farming practices. PFRA works in partnership with the irrigation industry and other government agencies to develop the irrigation infrastructure in the three prairie provinces. In Lethbridge, at Room 203, 704 - 4 Avenue South. Phone: (403) 327-4340.

**Alberta Agricultural Research Institute (AARI)** is a Crown corporation established to enhance the contributions of sustainable agriculture through research and technology transfer. They conduct research on crops, livestock, policy, marketing, and resource conservation. Located at 7000 - 113 Street, Edmonton, T6H 5T6. Phone: 780-427-1956.

## Internet Sites:

**Roping the Web:** Alberta Agriculture, Food and Rural Development's award-winning web site has up-to-date information on a variety of irrigation-related topics, as well as lots of links to other sites of interest. <[www.agric.gov.ab.ca](http://www.agric.gov.ab.ca)>

**Aginonet:** Over 3000 agricultural websites, with an exhaustive index of Canadian government, educational and private industry sites. <[Www.aginonet.com](http://www.aginonet.com)>

## Publications

**Water Hauler's Bulletin** - Published quarterly by AAFRD, Irrigation Branch. Contains articles and news of interest to irrigation farmers and others in the industry.

**MainStream** - Published twice yearly by the AIPA, in the interests of responsible water management.

**PFRA Communicator** - Published six times yearly by the Communications Division, Regina, Sask.

**Prairie Water News** - Published ten times yearly by the Saskatchewan Research Council, 15 Innovation Blvd., Saskatoon, Sask. S7N 2X8

**Irrigation Impact Study** - Prepared by UMA Engineering for the AIPA, 1993. A seven-volume report on the activities and conditions associated with irrigation in southern Alberta.

**Agroclimatic Atlas of Alberta** - Alberta Agriculture, Conservation and Development Branch, 1990. Agdex 071-1.

**Water Management in Alberta** - Alberta Environment, 1992.

**Agricultural Impacts on Water Quality in Alberta** - CAESA Water Quality Report, 1998. Available from AAFRD, Edmonton, Alberta.

**Irrigation in the Year 2000 and Beyond** - Published by and available from the Irrigation Branch, AAFRD, at the Lethbridge Research Centre.

## Irrigation Histories:

**Quenching the Prairie Thirst** by John Gilpin. Published by the Taber, Raymond, Magrath and St. Mary River Irrigation Districts, 2000.

**Just Add Water** by D. F. Gregorash. Published by the Lethbridge Northern Irrigation District, 1996.

**Prairie Promises** by John Gilpin. Published by the Bow River Irrigation District, 1996.

**Building a Future for Southern Alberta** - Alberta Public Works, Supply and Services, 1992.

**History of Irrigation in Western Canada** - Published by Agriculture and Agri-Food Canada, PFRA, 1982.