Irrigation in Alberta

On-Farm (1.73 million acres)
- 13 irrigation districts (1,419,989 assessed acres)
- 2,902 private irrigation projects (259,284 acres in SSRB and 51,388 acres north of the SSRB)
- 4.7% of Alberta’s cultivated land base
- Almost ¾ of Canada’s irrigated land is in Alberta

Storage
- 42 irrigation district reservoirs (1.1 billion m³)
- 15 provincially owned reservoirs (1.8 billion m³)

Conveyance
- 7,932 km of conveyance infrastructure ($2.72B)
- 4,793 km of drainage works ($111M)
- 170 major structures ($834M)

Other
- 8 hydroelectric plants (94 megawatts)

Economic Value of Irrigation in Alberta 2015 Report

Direct Economic Benefits
- $3.6B annual provincial GDP
- $1.3B annual revenue for GOA/GOC
- $2.4B labour income (56,000 jobs)
- 19% of the total primary agricultural sales in Alberta
- 20% of total provincial agri-food sector GDP

Irrigation-Related Agriculture Processing
- $2 billion in total sales
- 18% of the total provincial food processing sales
- $1.7 billion to the provincial GDP
- $1.0 billion in labour income (17,000 jobs)

Who benefits?
- Almost 90% of the benefits are accrued to the region and province, and only 10% to irrigation producers
Irrigation Rehabilitation Program (IRP)
- Began in 1969 to provide funding for rehabilitation of extensive water conveyance and storage infrastructure
- Cost-shared between Alberta Agriculture and Forestry and the 13 Irrigation Districts (currently 75:25)
- Since 1969, more than $1.127 Billion has been invested ($897 Million by the province and $230 Million by the irrigation districts)

Uses for Irrigation Water
Agriculture
- district and private irrigators
- livestock producers

Rural Development
- rural municipalities and rural residents (42,000 Albertans in 50 municipalities, rural water co-ops, and hundreds of farmsteads)
- rural industry (oil and gas, food processors)

Water Management
- flood and erosion control
- in-stream flow requirements
- apportionment agreements

Other
- hydropower generators
- recreation (golf courses, reservoirs, parks)
- waterfowl and wildlife habitat (>87,000 acres)

Water Allocation and Use
SSRB Surface Water Flow Volumes (1976-2005)
- 9.3 billion m³ Allocated for Use
- 5.4 billion m³ Allocated for Irrigation (75%)
- districts: 3.5 billion m³
- private: 0.6 billion m³

Used for Irrigation
- 1.7 billion m³ (19%)
- Flows to Saskatchewan: 7.1 billion m³ (76%)

Earth Canal
Open Channel
Concrete Liner
Membrane Liner
Membrane Liner with Armour
Buried Pipeline
Irrigation Infrastructure

Glossary of Irrigation Terms

- Border-diking: the use of soil ridges, that are parallel to the flow of water in a gravity-irrigated field to contain or direct the flow of the water down the slope of the field.
- Canal Rehabilitation: repairs and improvements to canals to improve the transport of water from source to users.
- Conservation Tillage: a farming practice that minimizes soil cultivation and disturbance and leaves crop residues on the soil surface for moisture conservation, erosion control, and maintenance of microbial biodiversity in the soil.
- Constructed Wetlands Habitat: the use of irrigation conveyance systems to deliver water to areas saturated with moisture either permanently or seasonally to create an environment that is favorable to wildlife and provide enhanced water quality by the elimination and reproduction of amphibians, reptiles, and mammals.
- Corner Arm: an additional length of pipe and nozzle on the end of an existing irrigation system used to irrigate corner areas of the field.
- Diversion Headgate: a structure that redirects water from a natural river or stream.
- Diversion weir: an obstruction extending across a river or stream to divert water into a main canal for the purposes of irrigation.
- Drop Structure: a structure to dissipate excess energy resulting from water moving from a higher to a lower elevation.
- Energy Dissipator: a structure used to dissipate the energy and substantially reduce the velocity of the water entering the structure.
- Farm Furnace: a structure to divert water from a canal or pipeline to an individual farm or field.
- Flood Mitigation: the use of irrigation infrastructure (e.g., ditches) to mitigate potential downstream flooding effects of floods by controlling the release of water.
- Gated pipe: a pipe with periodic and adjustable openings that is used to portionally control and divert water at the high side of a gravity irrigation field.
- Greatly Irrigated: a method of irrigation that uses the slope of the soil surface to distribute water to the crop, releasing water from a ditch or pipe at the high side of a field.
- Head Works: the canal and infrastructure system used to direct water from the diversion headgate to the irrigation district.

Irrigated Crops

- Forages
- Cereals
- Oilseeds
- Specialty
- Other

Top 13 Crops in 2015

- Hard Spring Wheat: 206,386 ac
- Canola: 158,745 ac
- Alfalfa Hay: 157,383 ac
- Barley Grain: 97,191 ac
- Tame Pasture: 85,913 ac
- Corn Silage: 66,756 ac
- Barley Silage: 60,260 ac
- Durum Wheat: 58,976 ac
- Dry Bean: 47,673 ac
- Potatoes: 40,284 ac
- Flax: 37,558 ac
- Alfalfa Seed: 35,952 ac
- Canola Seed: 35,479 ac

Irrigated Crops within the LND (179,625 ac) 1995-2015

- Forages
- Cereals
- Oilseeds
- Specialty
- Other

Irrigated Crops within the TID (83,584 ac) 1995-2015

- Forages
- Cereals
- Oilseeds
- Specialty
- Other

Processing Potato within the 13 Irrigation Districts 1995-2015

- McClure (Chip): April 2000
- Lamb Weston (Table): April 1989
Irrigation Management

RAT – Rate, Amount, and Timing of irrigation for optimal yield and quality
Based on:

- **Crop Characteristics**
  - Type and variety (effective root zone)
  - Stage of growth and plant population density
  - Target yield (fertility)
  - Crop quality requirements

- **Soil Characteristics**
  - Soil water content
  - Available water holding capacity
  - Infiltration rate

- **Climate**
  - Precipitation
  - Potential evaporation rate (temperature, radiation, wind)
  - Disease risk

- **Irrigation System**
  - Application rate and efficiency

**Alberta Agriculture and Forestry** promotes sound irrigation management practices and water use efficiency through:

- **Research and Demonstration** ([www.demofarm.ca](http://www.demofarm.ca))
  - Alberta Irrigation Technology Centre (AITC) Lethbridge
  - Crop Diversification Centre South (CDCS) Brooks
  - Bow-Island Sub-Station

- **Publications**
  - Alberta Irrigation Management Manual
  - Factsheets (11 crops)
  - Irrigation Management Field Book
  - Alberta Irrigation Information annual booklet

- **Conferences**
  - Irrigated Crop Production Update (January 2018)
  - Irrigation Management Workshops

- **Web-Based Support Tools**
  - Irrigation Management Climate Information Network (IMCIN) weather stations ([www.imcin.net](http://www.imcin.net))
  - IRRI-Cast: Crop Water Use Report
  - Alberta Irrigation Management Model (AIMM) ([http://agriculture.alberta.ca/acis/imcin/aimm.jsp](http://agriculture.alberta.ca/acis/imcin/aimm.jsp))
  - Irrigation Scheduler App (Washington State University) ([www.weather.wsu.edu/is](http://www.weather.wsu.edu/is))
  - Alberta Irrigation Energy Calculator

- **Funding Programs**
  - Growing Forward 2 Irrigation Efficiency Program

**Growing Forward 2 Irrigation Efficiency Program**: helps producers invest in new or upgraded low pressure centre pivot irrigation equipment for their operations, improving the efficiency of energy and water use.
- Producers eligible to apply once per parcel per system
- New purchases to replace gravity, side-wheel, or high pressure irrigation systems with low pressure centre pivots are eligible for up to $15,000
- High pressure to low pressure sprinkler conversions, VRI, control panels, etc. are reimbursed at 40% to a maximum of $5,000

In the 2016-2017 fiscal year
- 583 grant applications were processed
- Approximately $4.39 million distributed
- Farmers spent just over $27 million on those upgrades

[www.growingforward.alberta.ca](http://www.growingforward.alberta.ca)