State Funding for Irrigation in Montana
and
Consequences of Converting from Flood to Sprinkler Irrigation

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GOVERNMENT ASSISTANCE PROGRAMS AVAILABLE TO IRRIGATORS

This is a list of financial and technical assistance programs available to private and public entities for irrigation related projects and activities. Some of the programs were established specifically for private irrigators, where others require a public or local government entity (conservation or irrigation districts, for example) to sponsor projects that ultimately will support private irrigators.

STATE ASSISTANCE PROGRAMS

Irrigation Development Grant Program
Montana Department of Natural Resources and Conservation Resource Development Bureau
www.dnrc.mt.gov/cardd/ResDevBureau/irrigation_development/irrigation_dev_grants.asp

Private Water Development Loans
Montana Department of Natural Resources and Conservation Resource Development Bureau
www.dnrc.mt.gov/cardd/ResDevBureau/private_loans.asp

Renewable Resource Grant and Loan Program
Montana Department of Natural Resources and Conservation Resource Development Bureau
www.dnrc.mt.gov/cardd/ResDevBureau/renewable_grant_program.asp

Renewable Resources Project Planning Grants
Montana Department of Natural Resources and Conservation Resource Development Bureau
www.dnrc.mt.gov/cardd/ResDevBureau/project_planning_grants.asp

Reclamation and Development Grants Program
Montana Department of Natural Resources and Conservation Resource Development Bureau
www.dnrc.mt.gov/cardd/ResDevBureau/rdgp.asp

Growth through Agriculture
Montana Department of Agriculture
agr.mt.gov/business/GTA.asp

Fisheries Restoration and Irrigation Mitigation Program for Montana
Montana Department of Fish, Wildlife and Parks
fwp.mt.gov/habitat/fisheriesrestoration.asp

Conservation District Grants (HB 223 Grant Program)
Montana Department of Natural Resources Conservation District Bureau
www.dnrc.mt.gov/cardd/loans_grants/cdloangrants.asp#HB223

FEDERAL ASSISTANCE PROGRAMS

Environmental Quality Incentives Program (EQIP)
USDA Natural Resources Conservation Service
www.nrcs.usda.gov/PROGRAMS/EQIP/

Conservation Technical Assistance Program
USDA Natural Resources Conservation Service
www.mt.nrcs.usda.gov/technical/ecs/planning

Irrigation Operation and Maintenance on Indian Lands
Branch of Irrigation, Power and Safety of Dams, Bureau of Indian Affairs
www.federalgrantswire.com/irrigation-operations-and-maintenance-on-indian-lands.html

Farm Loan Programs
US Department of Agriculture, Farm Service Agency
www.fsa.usda.gov/FSA/webapp?area=home&subject=fmlp&topic=landing

POTENTIAL CONSEQUENCES OF CONVERTING FROM FLOOD TO SPRINKLER IRRIGATION

These are potential results, not all will happen in every situation. Some may occur rarely and some may occur with every conversion. Some are basin-wide and some are limited to a producer's field. Not everyone agrees on the frequency or extent of occurrence for most of the consequences listed below.

Flood to Sprinkler Conversion Effects on the Producer and Field

Labor savings and cost reduction

- Increases ability of some family farms to remain in production
- Increases ability of some producers to earn income from off-farm employment (less demand on operator's time due to automated irrigation, fertilizer & pest control)
- Reduces application rates and cost for fertilizers and other ag chemicals (due to precision application by sprinklers)

Increases productivity, especially on a non-level field

Decreases or eliminates available water for late season irrigation to downstream users

Decreases or eliminates available groundwater for downstream domestic wells

Increases ability of producer to irrigate sloped fields

Increases options for crop diversification

Increases nutrient output per acre.

Increases ability for additional harvest
(late season low flows may be adequate for amount needed to sprinkle irrigate)

Increases ability to expand irrigated acreage with the same water supply

Increases the availability of water to downstream users of an irrigation system
(reduced amount diverted leaves more water in the ditch)

Reduces the occurrence of losing grassland to sedge where previously over-irrigated

Increases capital investment & maintenance costs

Increases energy use and costs

Flood to Sprinkler Conversion Effects on Water Quality

Reduces contributions of ag chemicals to surface and groundwater
(precision application rates apply only what the plant needs)

Reduces sedimentation to surface water by runoff of excess irrigation water

Increases late season temperatures in natural water ways
(reduced return flows result in lower instream flows and less influx of cooler ground water which cumulatively tends to increase water temperature)

Flood to Sprinkler Conversion Effects on Water Quantity

Reduces the volume of water diverted for a given field

Increases loss through plant transpiration (due to increased plant production)

Changes return flow timing to increase early season surface flows and decrease late season return flows.

Increases the potential for an irrigator to divert water from a stream during low flow stage because less water is needed to adequately irrigate a field.

Increases or decreases evaporation loss depending on conditions

Increases consumptive use if crop productivity is increased
Lowers the water table
Decreases aquifer recharge
Reduces late season instream flows (through reduced diversions and return flows)
Eliminates or reduces late season return flows to groundwater and surface water

Flood to Sprinkler Conversion Effects on General Ecological Conditions

Reduces amount of water supporting wetlands
Reduces occurrence of saline seep areas
Supports early-season fish spawning by more closely reproducing natural conditions of higher spring flow vs. late season return flows.
Impairs fall fish spawning by reducing late-season groundwater return flows to surface water.
Decreases soil loss in surface reduced runoff
Decreased habitat for birds and terrestrial species

FACTORS THAT COULD INFLUENCE THE EFFECTS OF CONVERTING FROM FLOOD TO SPRINKLER IRRIGATION

Field Conditions the Influence the Effects of Converting to Sprinkler Irrigation

Topography (level or uneven field)
Soil texture & structure (affects drainage characteristics)
Changes in irrigated acreage or crop type due to transition from flood to sprinkler irrigation
Field shape (flood to center pivot may leave corner acreage un-irrigated on a square field)
Field size
Slope (flood irrigation produces more runoff, less infiltration sloped field)
Soil depth
Soil chemistry (pH)
Variability of these factors within a field
Crop type (grass vs. alfalfa hay, sugar beets vs. potatoes)
Crop demands (nutrients & other chemical needs)

Hydrologic Conditions

Depth to water table
Water source & availability
Receiving water for return flow (irrigation ditch, aquifer, stream)
Fishery instream flow demands

Operational Conditions

Financial feasibility
Distance of operator from field
Labor availability
Distance of water source from field
Diversion type
Diversion location
Use of subirrigation (sometimes supplemented or extended by flood irrigation)
Cost of electricity and fuel
Cost of transportation to market

Climatic Conditions

Wind
Solar influences
Precipitation
Evaporation rates

External Factors

Existing uses of flood irrigation return flows
Availability of reserved water rights (from Conservation Districts or Tribal Compact agreements)
Cooperative agreements with other water users
Legal restraints on water use (water rights, TMDLs for instream flows)
Status of water rights in a basin