



Irrigation systems — pump driven

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Equipment description

Irrigation systems take water from a supply source, such as a lake, pond, river, or well system and use it to provide the moisture for growing agricultural crops, plants, and trees. The irrigation process may be a flood system or a pressurized spray system. Many flood irrigation systems will use a pump to get water to a point so that natural gravity flow can then spread the water to a desired area. This discussion focuses on irrigation systems that incorporate pumps to move the water from the source to the irrigated area and provide pressure to operate water distribution devices such as drip lines and sprayers. Supply pumps, whether used in conjunction with an above-ground source or a well, are usually centrifugal type. The pumps may be driven by electric motor, internal combustion engine, or tractor power take-off.

Pressurized systems are either stationary in-ground, above-ground piping, or mobile above-ground systems. In-ground systems and above-ground stationary perforated drip installations are laid between rows of plants and usually used for relatively small areas.

Above-ground mobile systems usually cover a much larger area. Mobile straight line or circle pivot “walking” systems use large numbers of sprinkler heads in conjunction with their preset speed and path to control the amount and the spread of the water delivered. These systems use either hydraulic or electric motors to power wheels that carry the irrigation piping above the ground in a predetermined path. Circle pivot systems rotate around a center pivot which supplies the source of the water. The center point is often at a well head.

The best source of assembly, operation, maintenance, loss prevention, and safety information for your specific make and model of equipment is the original equipment manufacturer (OEM) owner manuals. Copies of these manuals and pamphlets can usually be obtained without charge from the OEM, including the OEM website.

Maintenance tips

- Adhere to the assembly, operation, maintenance, and safety guidelines provided by the OEM. Underground water supply piping has a virtually unlimited service life and requires little routine maintenance.
- Remote irrigation systems with an engine drive installed on the well require specific maintenance for the fuel system, drivetrain, and gearbox. Refer to the OEM manuals for the specific type and model of engine drive.
- Gearbox wear and potential early failure can be mitigated by proper lubrication. Check the oil level in the gearbox prior to each use.
- The shaft seal at the bottom of the gear box is a common leak point. Replace any damaged or leaking seals to prevent a complete loss of lubricant.

Failure/loss prevention tips

- Severe damage to “walking” irrigation systems is often caused by collision or upset of the moving structure due to weather conditions or objects inadvertently being left in the path of the system. Pay attention to tractors, carts, trucks, and other equipment being left in the system path.
- Proper alignment of “walking” lines must be maintained to prevent severe damage due to kinking the water supply pipe. Specific controls used to maintain alignment must be maintained per the OEM operation and maintenance requirements.
- All buried water piping should be installed below the frost line to prevent freeze damage.
- Disconnect and drain all non-buried lines prior to the winter season to avoid freezing and damage.
- Maintain a scaled drawing of the location of all buried piping to help prevent inadvertent damage during excavation.

Energy savings/conservation tips

- Proper adjustment of water volume and coverage area minimize the energy requirements for pumping water, thus minimizing fuel costs.
- Conserve water and runoff by properly adjusting the water volume and coverage area to meet needs.
- Make sure that any reciprocating head nozzles are cleared of nozzle obstructions such as stones that may have entered the piping system.

Safety tips

- Use the irrigation equipment as described by the OEM to ensure safe operation.
- Always position the water jet streams away from power lines to avoid energizing the irrigation system and creating a dangerous electrical hazard for workers.