

The irrigation system is maintained in accordance with a predetermined schedule

- Preventative maintenance is performed to keep the system within manufacturers/design specifications

Preventative Maintenance

Lack of maintenance will result in a decrease in system performance. An effective maintenance program for irrigation systems includes:

- Servicing schedules (including an inventory and spares in stock to be kept), and
- Replacement schedules for the different components.

Some general guidelines on maintenance of in-field irrigation systems are provided below, but complete information on the maintenance of different irrigation system components is provided in the Irrigation User Manual published by the ARC-Institute for Agricultural Engineering, P/Bag X134, Pretoria, 0001 or email iaeinfo@arc.agric.za. Most manufacturers also provide specific maintenance schedules for their products.

Micro irrigation systems: Maintenance schedule for micro-irrigation systems (manual control)*

Action	With each cycle	Monthly	Annually
Inspect system for leakages	X		
Check system pressure and flow rate	X		
Flush laterals (depending on the water quality)		X (or weekly)	
Service air valves and pressure control valves			X
Check hydraulic and electrical connections			X
Check functioning of hydraulic valves on filter bank and inspect moving parts			X
Chlorine treatment (depending on the water quality and method of application)			X (or monthly)
Take water sample at end of system and evaluate water quality changes			X (or monthly)

*The recommended maintenance schedule can be adapted for automatic systems, e.g. system pressure can be monitored monthly.

Sprinkler irrigation systems: Maintenance schedule for sprinkler irrigation systems (manual control)*:

Action	With each cycle	Annually
Inspect the system for leakages	X	
Check system pressure and system flow	X	
Service air valves and hydrants		X
Check sprinklers for wear and replace springs, washers and nozzles where necessary		X
Flush mainlines		X
Replace rubbers at quick coupling pipes where necessary		X

*The suggested maintenance schedule can be adapted for automatic permanent systems, e.g. system pressure can be monitored monthly.

After the irrigation season, and before the pipes are stored, the following must be done:

- Mark all the holes in quick coupling pipes with paint so that they can be repaired.
- Remove all gaskets from pipes if they are stored in the sun.
- Replace all damaged and hardened gaskets.
- Replace all worn male and female pipe fittings.
- Replace all dragline pipes that have more than three joints.
- Check standing pipes for corrosion and replace if necessary.
- Ensure that all standing pipes are the same length and straight.

Moving irrigation systems: Maintenance schedule of centre pivots

Action	After each revolution	After each 4th revolution	Seasonal
Electrical			
Switch on pivot and listen to each motor and starter. If any abnormal sound is heard, remove and service.			X
Replace end tower's electric bulb (if out) and remove dust, insects and water where necessary.			X
Check tower panel and main control cabinet. Clean panels, remove dust, insects e.g. wasps, etc.			X
Inspect condition of wiring of pivot			X
Inspect electrical motor cable condition, earth conductor and connections			X
Structure			
Tighten all bolts and nuts where necessary. Ensure that earth conductors are clean.			X
Grease pivot		X	X
Grease pin that holds swing mechanism of towable pivots to prevent rusting		X	X
Check system for leakages. Repair if necessary			X
Replace gearbox oil			X
Drain and replace lubricants in motors			X
Grease moving parts and roller bearings	X		X
Check U-couplings, grease if necessary			X
Check wheel bolts and adjust as prescribed	X	X	X
Check wheel pressure and adjust as prescribed	X		X
Check flange fittings for leakages, secure and replace if necessary	X		X
Inspect framework for sturdiness – tighten bolts if necessary	X		X
Check that all the safety switches work			X
Check that all the drainage valves work	X		X
Clean sand trap if necessary	X		X

Sprinklers			
Check nozzles for wear, replace if necessary			X
Check that the pressure meter works correctly			X
Check the condition of the sprinklers			X
Check pivot pressure and pressure at beginning of towers			X
Check for blockages in nozzles	X	X	X
Flush the system (especially when not in use for more than a month)		X	X
Equipment			
Check functioning of end nozzles and check nozzle for wear			X
Inspect cut-off action of end nozzle – repair or replace if necessary			X
Check stop in slot micro switch, adjust if necessary	X		X
Test the automatic reverse-action movement of pivots by switching the hand lever forward and back			X
Fill wheel tracks deeper than 150 mm with timber or stones		X	

With linear systems, the following additional measures must be kept in mind when maintenance is undertaken:

Drive: All electrical cables must be checked regularly and replaced if necessary. Check bearings and belts and adjust if necessary.

Alignment: Check alignment according to manufacturer's prescriptions. Where a system uses a supply line that must be towed, the road must be as even and dry as possible to make the towing of pipe easier.

Maintenance schedule of centrifugal pumps

Monitor	Monthly	1 000 Operating hours	Bi- annually	Annually
Check alignment / settings			X	
Replace oil			X	
Inspect bearings and clean		X		
Inspect all parts for wear and do hydraulic test (check pressure against flow)	X			
Inspect the gland packing leakage (it must leak slightly, because it is lubricated by water)	X			
Replace the gland packing				X
Inspect cables and electric equipment			X	

Note: Centrifugal pumps are by far the most commonly used.