

Hunter Starting Smarter Irrigation Project

Pre-season Checklist Travelling Irrigators

Is your system well set-up?

A pre-season check of your travelling irrigation system will ensure you are ready to start irrigating *on time* and are set-up well for the season ahead. Remember, a delayed start to irrigating your pasture or crop at the first indication of monitored soil moisture depletion will result in loss of production and income.

Simple checks to correct issues that were evident during the previous season, or have occurred whilst the system has been idle, will result in more efficient water and power use and avoid mid-season break downs. A close inspection also identifies items for updating maintenance checklists and proactive management of foreseeable issues before they become a costly crisis. These systems perform at their best when operating to specifications.

All pressurised irrigation systems need to have a pump that is properly selected to the system's duty, is operating efficiently and is well maintained. If the pump is not performing properly, the irrigation system won't either. Ensure the pipe sizes are adequate, especially the suction pipe, ensure the foot-valve and strainer are not blocked, check inside the pump for partial or full blockages, ensure the operating pressure and flow are according to specifications, and have the efficiency checked at regular intervals.

What do I need to check?

Irrigation New Zealand's [Guide to Good Irrigation](#) (2011) is well worth a check prior to each season. It will act as a reminder of the preparations, operations and management considerations which should be addressed. This guide recommends an annual maintenance check by the supplier of your travelling irrigator.

To check your system properly prior to the season and during the season, it is essential to have appropriate gauges and meters. These include a pressure gauge and flow meter at the pump, pressure gauges on either side of the filter, and a pressure gauge at the traveller.

A check list is provided on the next page. These are the fundamental common items which should be used to guide your site specific system checks. It is always best to do these checks with a second person- the additional labour costs will certainly be returned when your system is having less break-downs, using less energy and correctly applying water over the coming season!

Pumps are the heart of a travelling irrigation system. Make sure it is going to meet the duty of your travelling system and is operating within the performance curve at an efficiency of 70-80%. Take action if it is operating more than 5% below specification.

Tips

- Safety First- many items can be fixed on-farm, others require specialist skills or equipment. Know your limits and obligations.
- Walk the system with new employees before they operate for the first time and have all operators read the operating instructions prior to start-up.
- Strong winds affect spray patterns and may vary application rates up to 10 X the average of calm conditions. Irrigate when conditions are still.
- Travelling guns should travel perpendicular rather than parallel to the prevailing wind to minimise the effects of wind on distribution uniformity (DU).
- Lane spacing of 60–65% of wetted width in still conditions, and 30–50% for windy conditions, significantly improves DU.
- Speed variations within runs can be as high as 50%. Reducing speed variation increases DU. The main factors are uneven topography, increasing drag length for soft hose machines, and variations as the hose winds-up for hard hose machines.
- Reducing the sector angle improves distribution uniformity- 270° to 330° can result in less water wasted along travel lanes and reduces tracking problems.
- Trajectory angle of 24° is a good compromise between throw distance and wind effects.
- Operating pressure should be the minimum recommended by the manufacturer. This may lead to considerable savings in pumping costs. Poor DU will result if the pressure of the system is too low.
- Taper nozzles produce greater wetted diameters and are better in windy conditions. Ring nozzles break up the spray trajectory causing smaller droplet sizes and reduced wetted diameters.
- For travelling booms, sprinkler selection is also important. Uniformity depends on wetted diameter, height above ground, and sprinkler spacing. Sprinklers with small wetted diameters are more likely to have problems with high average application rates, resulting in ponding and runoff. Altering the boom height changes the wetted diameter.
- Consider soil moisture monitoring and weather forecasting options. Linking soil moisture monitoring with weather forecasts, using a simple water balance tool such as the Scheduling Irrigation Diary for Dairy, allows you to better gauge when to start-up and take advantage of rainfall to save time (irrigation days) and money (pumping costs).

Pre-season Checklist- Travelling Irrigators

SYSTEM “OFF” CHECKS

Component	Check
Water supply	<input type="checkbox"/> Checks completed
Pump	<input type="checkbox"/> Clean inside and out, flow meter and pressure gauge serviceable
	<input type="checkbox"/> Belt drive is tight
Filtration	<input type="checkbox"/> Rings/screens clean with no holes
	<input type="checkbox"/> Pressure gauges in good condition
Hose reel and cable reel	<input type="checkbox"/> Structure condition, corrosion or damage
	<input type="checkbox"/> Gearboxes, drive shafts – lubricate as required
	<input type="checkbox"/> Cable winch action and ratchets
	<input type="checkbox"/> Tighten all bolts, check pins
	<input type="checkbox"/> Lubrication, grease
	<input type="checkbox"/> Seals and flanges
Gun cart	<input type="checkbox"/> Structure condition, corrosion or damage
	<input type="checkbox"/> Wheel bolts, tyre condition and pressure
	<input type="checkbox"/> Tighten all bolts, check pins
	<input type="checkbox"/> Condition of other connections
	<input type="checkbox"/> Lubrication, grease
	<input type="checkbox"/> Seals and flanges
	<input type="checkbox"/> Rotating boom turntable not worn, allows free turning
Drag hose	<input type="checkbox"/> Hose condition for wear, kinks or other damage
	<input type="checkbox"/> Boots – tighten bands if necessary
Sprinklers	<input type="checkbox"/> Nozzle orifice condition – replace if wear detectable
	<input type="checkbox"/> Ensure rotating nozzles are free turning and cages not damaged

Sprinklers Continued	<input type="checkbox"/> Splash plate, angle, alignment
	<input type="checkbox"/> Components for looseness, freedom of movement
	<input type="checkbox"/> Outlet nozzle orifice condition – replace if wear detectable
Prepare to start	<input type="checkbox"/> Ensure nothing is parked in front of the irrigator

SYSTEM “ON” CHECKS

Component	Check
Pump	<input type="checkbox"/> Pressure and flow as specified
Hose reel and cable reel	<input type="checkbox"/> Reel(s) turning smoothly
	<input type="checkbox"/> Hose or cable winding in correctly
	<input type="checkbox"/> Inlet pressure gauge – replace if necessary
	<input type="checkbox"/> Inlet pressure– preferably at furthest hydrant
Drag hose	<input type="checkbox"/> Turbine functioning
	<input type="checkbox"/> No leaks
	<input type="checkbox"/> Not mis-shapen
Gun cart	<input type="checkbox"/> Cart moving correctly
	<input type="checkbox"/> Inlet pressure– replace gauge if necessary
	<input type="checkbox"/> No leaks
Sprinklers	<input type="checkbox"/> Each sprinkler is turning correctly and cage not damaged
	<input type="checkbox"/> No leaks, repair or replace as necessary
	<input type="checkbox"/> Pressure above last sprinkler, above pressure regulator if fitted
Gun	<input type="checkbox"/> Operation
	<input type="checkbox"/> Gun angles are correct, switches direction at right locations

Checked by: _____ Date: _____