

Centre Pivot Irrigation – Water Quality

Introduction

Water quality is an important issue that influences the life of irrigation systems. Before installing an irrigation system, the quality of the water should be tested and a construction material be selected that will maximise system life.



Factors influencing Corrosion

A number of elements and properties can contribute to the corrosion potential for a system:

- pH level;
- EC and total dissolved salts;
- Sodium, chlorides and sulfates;
- Water hardness and alkalinity; and
- Temperature and exposure time.

Centre Pivot Material

Typically galvanised pipe is used when water quality is not a concern. A number of other products are available when water quality is an issue. The most appropriate material to use will depend on the specific water quality issue. The following are material options for centre pivots:

- Galvanised, not suitable for low pH and high chloride and sulfate concentration;
- Aluminum, not suitable for high alkalinity;

- Stainless steel, suitable for most conditions;
- Under slung PVC, good for both acids and alkalis (pH range from 3 – 11);
- Epoxy coating and PVC or Polyethylene lined pipe, similar to under slung PVC; and
- Cathodic Anode corrodes a magnesium strip inserted into the bottom of the span rather than the zinc coating on the pipeline.

Pivot Management

The potential for corrosion can be minimised by good management techniques. They include:

- Ensuring drains are not blocked (Extended hoses can be fitted so water is not drained into the wheel tracks);
- Periodic flushing of solids with fitted flushing valves;
- Extensive flushing after chemigation and fertigation;
- Ensure during pivot assembly that seals between main pipes are correct size and don't allow water / solids to sit in the joins; and
- Limit the amount of time water is let sit static in the pipes.

Economics of Water Quality

Water samples should be provided to manufacturers for analysis before designing centre pivot. If analysis indicates poor water quality, it is recommended that extra capital (approx. 13%) be outlaid to select a material that will minimise corrosion and increase the life span of the system.

The extended life of the machine will far out weigh the increase in capital cost. The pivot dealer should be able to recommend the best material based on the water quality and previous experience.