Irrigation for Profit

Centre Pivot Irrigation – Fertigation & Chemigation

Introduction

Fertigation and chemigation is the process of injecting fertiliser and chemical into irrigation water and applying through the irrigation system to the crop/field.

Fertigation

Advantages of fertigation:

- Nutrients can be applied on the basis of crop need;
- The amount of water applied can control the placement of nutrients and readiness for plant uptake;
- Uniform nutrient application if good system water distribution uniformity;
- Eliminate some tillage operations;
- Reduce application costs;
- Less groundwater contamination, through reduced fertiliser use; and
- Minimise crop damage during application.

Disadvantages of fertigation:

- Nutrient application uniformity is only as good as the system water distribution uniformity;
- Some fertiliser materials often can not be used;
- Localised fertiliser placement is not possible; and
- Additional equipment is required for fertiliser injection.

Chemigation

Advantages of chemigation:

- Uniform chemical application;
- Chemical is applied where needed and in the correct concentrations;
- Less expensive to apply chemical than conventional application methods;
- Chemicals can be applied when other method are impossible, due to wetness, excessive wind, applicator availability;
- Reduce application costs, soil compaction and crop damage associated with in-field spray equipment; and
- Less human contact.

Disadvantages of chemigation:

- Requires high management of chemical with handling, calibration and scheduling;
- Additional equipment is required for chemical injection; and
- Higher risk to water source.

Water Quality

Water quality should be considered before attempting to fertigate, as precipitation of some element in the fertiliser may occur. Other reactions may occur between the fertiliser and impurities in the water.

System design and Construction

Due to the nature of fertigation/chemigation it may induce or accelerate corrosion of irrigation equipment and reduce the system life. Consideration should be given to the construction material and the fertiliser/chemical used.

Due to the small depth of water required for some fertigation/chemigation applications, high-speed gearboxes or a low flow sprinkler package maybe required to apply depths of 2.5 – 5mm/pass.The irrigation system should be well flushed immediately after fertigation/chemigation.

Before any fertiser/chemical injection, it is best to consult the chemical supplier. Make certain that there are no restrictions for injection and the product is labeled for the specific application

Information sourced from: Fipps, G. 1998. Getting the most from Centre Pivots. Texas Agricultural Extension Service, Texas A & M University.
Foley, J.P. and Raine, S.R. (2001). Centre pivot and lateral move machines in the Australian cotton industry. *National Centre for Engineering in Agriculture Publication 10000176/1*, USQ, Toowoomba
Nelson Irrigation Corporation, 2000, Center Pivot sprinkler guide and technical application guide, Walla Wall, USA