

MAXIMISING FERTIGATION RESULTS

BY SHANE SINGH – AGRIHORT SOLUTIONS



Fertigation is a broad term that means delivery of dissolved fertiliser through irrigation water. It is a great technology that provides growers with the flexibility to deliver nutrients to the crop when required; rather than according to work schedule. Fertigation combined with a good nutrition plan targeting the nutrients needed for set, sizing and fruit quality produce apparent results at harvest that extend through the postharvest supply chain.

Whether you are considering fertigation or already have a system in place your irrigation infrastructure is the most of fertiliser to your crop. Uniform delivery is the key to successful fertigation, without it you may find production variability within blocks and not all irrigation systems are designed to operate fertigation systems.

So, if you are considering fertigation as an innovative technology for your enterprise or you already have a system in place here are some points for your attention:

1. New Technology? In many areas, this is not new technology however, in areas that have traditionally relied on high rainfall, irrigation and fertigation are now being investigated as a way to increase productivity.

- a. Irrigation type:** Drip irrigation effectively delivers water and nutrients directly to the root zone however, if substantial volumes of fertiliser are applied, root damage can occur. Sprinklers are also suitable for fertigation; they deliver water and nutrients to a larger area outside the rootzone which is largely uncontrollable.
- b. Fertigation type:** There are many fertigation systems in the marketplace, most systems can be classified into three fertigation types:

- i. **Bulk dosing:** As it implies you fertigate a large amount in a brief period, this can be daily, weekly, or monthly depending on how involved you want to get.
- ii. **Continuous fertigation:** This method is more involved and requires a better understanding of fertigation and plant nutrition. It applies small amounts of fertiliser constantly whenever irrigation is applied.
- iii. **Open Hydroponics:** Like continuous fertigation with a couple of differences. Fertigation Electrical conductivity (EC) and pH are adjusted to suit the crop physiology requirements.
- c. Filtration:** A separate filtration system will be required for fertigation tanks and injection points to avoid undissolved or incompatible fertilisers entering the irrigation system that can clog up lines, drippers or sprinkler heads.
- d. Property size:** The size of the farm will influence the distance the fertiliser needs to travel before it reaches the desired block to be fertigated, it could be minutes or hours. It may be more practical to have multiple injection points on larger farms.
- e. Construction materials:** Fertilisers can vary in their acidic / alkaline properties and can cause damage to older systems with fibro-cement mainlines and some types of fittings in newer irrigation systems.

2. Irrigation system maintenance – This should be on the top of your list! Without a well-maintained system, you are throwing your money away. Problems created through lack of maintenance include:

- a. Under or over watering;
- b. Increased power costs;
- c. Uneven watering due to blocked emitters or lack of pressure;
- d. Loss of production and profitability.

To maintain your irrigation system, you should check your operating pressures and implement a regular maintenance program to:

- a. Flush the mainline, submains & irrigation lines;
- b. Remove algae growth using either Chlorine or Hydrogen peroxide;
- c. Remove deposits caused by irrigation water and fertilisers using acids.

CAUTION MUST BE TAKEN WHEN USING CHLORINE, HYDROGEN PEROXIDE AND ACIDS. INCORRECT HANDLING OF THESE PRODUCTS CAN CAUSE DAMAGE TO YOUR HEALTH OR YOUR INFRASTRUCTURE. IT IS ALWAYS BEST TO SEEK SPECIALIST ADVICE WHEN USING THESE PRODUCTS.

3. Water source – This is generally not a major problem in Australia, but in some areas irrigation water can cause problems. Water quality aspects that should be considered are: pH, alkalinity, water hardness, Electrical conductivity (EC), Sodium Absorption Ratio (SAR), Chloride and contaminants.

Having these water quality parameters tested can give you an indication of any issues and the suitability of the water source for your crop. You should consider getting your water tested and regularly testing the pH and EC; both are good indicators for any changes in water quality. For more about water quality, refer back to **The Passion Vine AUTUMN 2019** edition.

4. Fertilisers – The choice of fertilisers are endless, there always seems to be a new one on the market. So, consider the following when selecting fertiliser for fertigation:

a. Liquid Fertiliser Vs Dry Soluble fertilisers

- i. Generally liquid fertilisers are the same as dry soluble fertilisers, the difference is someone has premixed the fertilisers into a fertigation solution for you and for this privilege you pay a premium over dry soluble fertilisers.

- ii. Many liquid fertilisers claim to be more available to plants than dry soluble fertilisers, this is generally not the case.
- iii. When choosing the fertiliser type, consider cost, ease of use and/or occupational health and safety. Either dry or liquid fertilisers are suitable for fertigation.

b. Tank Mixing

- i. Fertiliser solubility is a major consideration when mixing fertilisers. If the solubility limit is exceeded the fertiliser will stop dissolving. The main consideration in fertiliser solubility is the type of fertiliser and the water temperature, for example Potassium Nitrate has a solubility of 21kg / 100L @ 10°C and 32kg / 100L @ 20°C.
- ii. Nitrate based fertilisers create an endothermic reaction when mixed in water which means that the water temperature drops and you might find that a water temperature of 20°C has become 15°C, affecting both solubility and tank mixing.

- iii. Not all fertilisers are compatible and major problems arise around Calcium based fertilisers. Care must be taken when mixing up fertilisers at all times; I have seen compatibility reactions occur between fertilisers just because the fertigation tank was not cleaned between tank mixes.

5. Crop nutrient requirements –

It is important to meet the nutrient requirements of the crop and this starts with a good nutrition plan. Do your homework and look at your soil organic matter levels, soil structure, cation exchange capacity (CEC), soil water holding capacity, crop load and previous fertiliser applications.

A good nutrition plan needs to be monitored and adjusted throughout the season based on soil and leaf analysis, crop health, crop load, climate and crop physiology. Your irrigation infrastructure is essential to maximising fertigation results. Now is a good time to implement your irrigation system maintenance plan.

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