



Nursery & Garden Industry
Queensland

An Introduction to Fertigation in Production Nurseries

Fertigation is the application of dissolved fertilisers to nursery crops through an irrigation system. In fertigation systems the plants absorb most of their nutrients through the root system, but some absorption can also occur through their leaves. Foliar absorption of trace elements can be an important method of addressing deficiencies of some nutrients. However, fertigation should not be confused with foliar application. Foliar application of fertilisers is achieved through spraying the fertiliser solution on the plant leaves, with the majority of nutrient uptake occurring through the foliage. When fertigation is used the majority of the nutrients applied are taken up through the rootsystem, with foliar uptake being a secondary pathway. Foliar applications also use higher mixing rates and much lower volumes of water than fertigation.

Fertigation provides the opportunity to:

- *manage nutrient availability throughout the production cycle,*
- *supplement fertiliser supplied in the growing media,*
- *manipulate plant growth,*
- *alter the fertiliser program during the growing season,*
- *correct nutrient deficiencies.*

The irrigation system used to deliver the dissolved fertiliser must not only be efficient, but operating to the upper level of industry best practice to provide an even distribution of water and fertiliser, limiting possible environmental issues associated with high levels of nutrients in waste water. Well designed drip, bottom watering, and mobile boom irrigation systems are compatible with fertigation techniques, while overhead sprinkler systems must operate efficiently, and be coupled with a managed wastewater recycling system, including a barrier between the growing bed and underlying soil to



minimise the movement of drainage water into the underlying soil and water tables.

Fertigation places dissolved fertilisers directly into the irrigation system and consequently requires regular maintenance and careful management to prevent:

- *an increase in bacteria, algae and slime,*
- *undissolved fertiliser in the irrigation system,*
- *irrigation system blockages,*
- *corrosion of irrigation components,*
- *increased nutrient levels in wastewater.*



Particular care should be exercised in selecting fertilisers for use when fertigating. The fertiliser products used in fertigation must be readily soluble and of the highest quality, e.g. technical grade. There are a range of formulated soluble products available to nurseries, prepared for specific crops or plant growth stages, e.g. flowering. However, standard fertilisers provide the most cost effective application, and allow nutrient programmes to be tailored to address specific water quality and crop requirements.

The selection of the correct injection equipment is just as important as the selection of the correct nutrients in a fertigation system. Two common methods of fertiliser injection are pressure differential venturi and pump injection systems.

Pressure differential venturi systems are based on the principle of a valve or regulator creating a reduced pressure in the system. This allows fertiliser solution to be drawn into the line. These systems:

- are simple to operate,
- are easy to install,
- require little maintenance,
- are relatively low cost
- can provide relatively accurate control of fertiliser rates if flow rates do not vary significantly.

Pump injection is the most common method of injecting fertilisers into irrigation systems. The pump delivers fertiliser solution from the supply tank directly into the pressurised mainline in a measured dose. Electric injection pumps can be installed to receive an electrical pulse from a water meter to deliver a precise measure of fertiliser.

Pump injection systems:

- are simple and effective,
- are relatively easy to install and maintain,
- are suitable for high pressure systems,
- allow proportional or quantitative fertigation,
- can be automated.

Fertigation is a simple but effective management tool for nurseries, but requires a sound knowledge of fertilisers, plant nutrient and an efficient irrigation system.

For more information on fertigation see the industry guide 'Managing Water in Plant Nurseries' and the WaterWork workshop.

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