



Case Study

FERTIGATION PERFORMANCE TEST – THE PROCESS IS SIMPLE, THE RESULTS INVALUABLE

Fertigation systems are used widely in the horticulture industry to distribute fertiliser directly to crops via the irrigation system. The performance of fertigation systems depends on the injection type used and the application system. Correct injection rates and an application system that applies water uniformly are crucial to ensure that the distribution of fertiliser is uniform and effective.

On farm assessments conducted on a banana farm in the Wet Tropics showed how the calculation of injection and flush times can greatly affect the performance of a fertigation system. The evaluations showed that while the grower had an efficient pump and irrigation system with good uniformity, fertiliser was not being distributed evenly throughout the crop.

Firstly a pump efficiency and irrigation uniformity assessment was carried out on the 24 hectare (64 acre) farm. Both the pump and irrigation system assessments showed a high level of performance. The variable speed submersible pump operates better than the target of \$5 / ML / m. The 40 L/h sprinkler system was within the design operating pressure and delivering the desired application rate with no more than 10 per cent variation. Overall the irrigation block scored well with a Distribution Uniformity (DU) of 93 per cent and a Coefficient of Uniformity (CU) of 96 per cent.

The objective of a fertigation system assessment is to measure the time it takes to get fertiliser from the fertigation tank to the first emitter in the block and then the last emitter in the block. To undertake this assessment Growcom uses red food dye and adds it to the fertigation tank.

Growcom has attempted to use other markers and/or measuring devices but red food dye gives a more consistent result. A factsheet on how to complete an assessment and what the numbers mean can be found on the Growcom website (www.growcom.com.au).

The grower had previously attempted this exercise using calnitrate fertiliser in the tank and nitrate test strips in the field rather than food dye but found it fiddly and the results unclear.

The results of the dye test showed the difference in time taken to reach the first and last emitters was almost double what the grower had expected. The current fertigation schedule did not allow for the injection time and minimum flushing time, meaning fertiliser would remain in the main/sub-mains and not be correctly distributed in the block. By changing irrigation

blocks too soon, the fertiliser intended for this block would have been sent to the next irrigation block. Following this exercise the grower changed the injection rate and altered the configuration of the laterals to reduce the distance required for the fertiliser to travel. A follow up assessment showed both injection time and flushing times were significantly reduced and far better suited to the grower's fertigation scheduling plan.



The grower plans to continue to fine-tune the system, using an electrical conductivity (EC) meter to accurately measure the injection and flushing time of each of the irrigation blocks on the farm. Nitrate strips (nitrate fertiliser), electrical conductivity meters (salts), pool test kits (acid and chlorine) and molasses can also be used to check the system.

The grower spoke highly of the service.

“The initial assessment highlighted the fact that the fertiliser was not being distributed evenly throughout the block and because of the short flush times some fertiliser was not even making it to the block. The problem was easily rectified by rearranging some of the laterals and changing injection rate and flush times. Given the total cost for changes was \$10 for materials and one hour of time, the assessment has been invaluable in rectifying a problem that I did not know existed,” he said.

For more information, contact the Growcom Land and Water Field Officer on 07 3620 3844.



Above: Growcom uses red food dye as a marker when conducting fertigation assessments.

Disclaimer: This information is provided as a reference tool only. Please seek professional advice.

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