FACT SHEET
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Turf Queensland
Grow Green

FERTIGATION & FERTILISER USE

Due to the high interest in efficiency increases and the uptake of Fertigation in the irrigation and fertiliser practices on quality turf farms, the following has been requested by Turf Queensland from our major sponsor Nuturf a specialist fertiliser provider. I'm sure you will find this of interest and probably clarified many questions that you as an irrigator will have regarding fertigation use and benefit on your turf farm.

There is one main point to fertigation that needs to be defined;

There are liquid products that are in fact liquid, and there are soluble products which are effectively solids that can be easily dissolved in water. Typically speaking liquid products are more expensive than soluble however there are exceptions to the rule.

The following FAQ's will assist in clarifying many issues.

1. **What fertiliser do we actually need within the soluble range produced by Nuturf?**
   Primarily Nitrogen (N) is the driving force required for growth (leaf and shoot growth), followed secondary by Potassium (K) (stress tolerance) and then Phosphorus (P) (root growth)
   Macronutrients;

   Nitrogen (N):

   · Most important turfgrass nutrient by far.
   · Has a role in nearly every plant physiological process.
   · Urea 46% N
   · Ammonium Nitrate 34% N
   · Ammonium Sulphate 21% N
   · All provide a green-up response and a flush of growth.
   · Can have too much of a good thing!

   Phosphorus (P):

   · Turfgrass requires a steady supply of phosphorus (3rd after N & K).
   · Important for cell division and growth – ***especially in the early stages of growth –*** *seeding / sod / renovations.*
   · ATP – Energy within the plant.
   · Critical for root growth.

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Potassium (K):

· Large amounts of potassium are required in sports turf (up to 3% by wt) to improve grass tolerance to:

· Cold

· Heat

· Disease

· Wear

· High potassium levels in cells absorb and hold more water and contribute to improved drought tolerance.

· Hardy turfgrass needs potassium.

Micronutrients;

· Iron (Fe) – chorophyll production, enhances green appearance without growth

· Manganese (Mn) - Nitrate assimilation, Photosynthesis, chlorophyll production, Lignin production, Influences auxin levels (important for root growth)

· Calcium (Ca) - Required for cell strength (strong leaf blades)

· Magnesium (Mg) - Efficient photosynthesis = carbohydrate (energy production)

2. Is it cost-effective remembering current use is granular fertiliser (possibly straight urea) and Chicken Manure?

Need to establish how much nutrient is currently being used v what is required? Then we can define true cost evaluation.

Fertilising:

Trials in the US suggest that couch turf quality (colour & density) is best at 4.5 kg N/ 100m2 / year (White 1999)

= 0.375kg N / 100m2 / month

Maintain the NPK ratio at 8:1:5 (Beard etal 1973) - Therefore (4.5kg N, 0.56kg P, 2.8kg K)

3. Is there any figures comparing granular with soluble utilising Fertigation? This could be in other industries.

This depends on the makeup of the fertiliser and what is needed to maximise benefit in yield and quality.

The hydroponic industry is the only market that primarily fertilises through fertigation.

Solubles – are approx. double the price of granular with the exception of ammonium sulphate. However expectations of 30% gain in nutrient efficiency over granular can be expected.

Liquids – typically contain technical advantages over soluble and granular in terms of plant availability and or quality. There are however nitrogen products UAN (Urea and Ammonium) or AN (Ammonium Nitrate) that are simple non-slow or controlled release. Liquid potassium and phosphorus products are more costly than granular fertilisers however, less is required.

Price examples;

Gran Urea $700/ton, Soluble Urea (low Bi) $800/ton, Liquid Urea $1000/1000L IBC

Gran Ammonium Sulphate $600/ton, Soluble SOA $600/ ton, Liquid Ammonium Nitrate $2200/1000L IBC

Gran Potassium Sulphate $900/ton, Soluble SOP $900/ton, Liquid SOP $1400/1000L IBC

Gran Mono Ammonium Phosphate $800/ton, Soluble MAP $1500/ton, liquid not available

4. **Is there different soluble fertilisers to cover all mixes or independently for nitrogen, potassium, phosphate and other nutrients?**
   Yes as detailed above.

5. **How does the farmer know what is required from the soil and crop perspective? Many, especially the accredited producers, have undertaken soil and water tests but maybe more are required across the farm.**
   With fertigation greater understanding of irrigation, soil health (soil analysis) and plant requirements (tissue analysis matched with growth required) is required to maximise potential cost benefits.

6. **Are EM38 soil and Greenseeker NDVI crop mapping and analysis sufficient to advise that from the mapping and reports?**
   This would form part of the picture but not all. Soil and water tests are important.

7. **If not what has to occur to support the turf producers knowledge?**
   If warranted by farmer support a fact sheet or workshop on understanding fertiliser technology, defining plant nutrient requirement and irrigation performance.

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8. How much $$$ is a soil and water test?

There are many available from $80 for a basic soil test up to $150 for a full interactive web-based service. Similar for water testing with approx $120 for a basic test up to $220 for full interactive web-based.

9. Do tests need to be done across the farm or is one centrally located sufficient? If they have done the mapping there is probably one or more soils identified on farm and each soil type maybe needs to be checked.

General testing indicative of area is normally suffice, however isolated testes are recommended for trouble shooting or where distinct differences in soil types are evident. Only differentiated water tests required is source is varied e.g. Bore, rain water or effluent.

10. What about crop requirements if there are a number of different species?

Turf requirements are typically the same from a nutritional perspective. Only variations for water requirements between cool and warm season varieties.

11. How much fertiliser do they mix with the water - what percentages are relevant?

This is dependent on water quality and fertiliser quality from tests. Dilution ratios of 1:10 to 1:100 are common depending on product. The higher the salt index the more dilution required.

Ashley Neuendorf

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