

“What’s so different about how you apply nutrition?”

(And why you will deserve a wage rise)



David Snowden looks at the various methods used to apply nutrition.

The advances in spray equipment, have enabled Course Managers, and their spray technicians to apply nutrition, and other chemicals with greater accuracy, and efficiency.

Sports turf, and, in particular, high maintenance golf turf requires all the correct nutrients, in the correct forms, on a continual basis throughout the growing season.

However, there are three main areas, which will influence what you apply, when you apply it and in what form. These are - Physical, Chemical, and Microbial.

The physical aspects of the soil

are largely determined by the composition of the soil, meaning the soil physically allows for the continual movement of Nutrients, Oxygen (and CO₂), and water throughout the soil profile.

Most chemical reactions and activity in the soil take place in and around the clay particles and organic matter, so changes in the physical conditions will always affect the chemical characteristics of the soil. i.e. compaction and aeration, etc.

Microbial activity is vital in the soil, without microbes there will be no oxidation, which is essential for nitrogen conversion, and certain other fertiliser compounds to be

broken down into a solution, therefore becoming available for root up-take, if you have an adequate root system!

Healthy microbial activity is dependent upon Nutrients, Oxygen, Water, and temperature. This is a never ending process, ensuring adequate levels of nutrition, Oxygen, and water in a favourable balance.

Here is a commonsense rule of thumb to understanding nutrient application.

Soils are generally low in oxygen, cold, with a reduced root system after winter, and low sunlight in spring and autumn, reducing



microbial activity, photosynthetic process, and therefore nutrient up-take.

Here is the Catch 22. Is there any point of applying something to the soil when all the conditions are telling you not to at that specific time year?

Granular, Organic & Controlled Release Fertilisers are vital for a base feed, and specific soil amendments.

The technology in producing high quality granular products has also advanced tremendously.

But REMEMBER you still need roots, the right temperature, with good physical and microbial environment, to ensure the products are converted it to a solution, and work with good efficiency. If this is not the case then the product efficacy will be compromised, and not a cost effective way of applying fertiliser, So it may be worth looking at some form of liquid application, whether it is a foliar which by-passes the growing medium completely, or a soil liquid, which can address the interim gap before granular soil applications become effective.

Soil liquid applications; They can be faster acting than granular applications, but are still temperature driven.

Good for NPK, and have a relatively quick response depending on the nitrogen source.

Let's look at the high spray vol-

umes which are designed to apply soluble, and soil liquid products to the crown and root zone area.

Spray solutions are applied under pressure, whether it's for high volume or low volume. Large orifice spray nozzles produce "rain-drop" type spray droplet most often encountered with high volume sprays. This type of droplet size does not provide maximum leaf coverage, and makes it nearly impossible for a large water droplet to stay on the leaf surface to be absorbed.

There is much more chance of run off, into the crown area, where it is designed to be used effectively by the upper root system of the plant.

You will often see written on a product label the following information.

- Apply product in 400-1000lts of water per hectare.
- Lightly water in after application.
- For higher volumes of water to secure the products into the crown; soil area. e.g. (Tee jet White 11008 VS; 2 bar 5 km/h gives 600 L/ha; Hardi white 08-110; 2 bar 5 km/h gives 620 L/h)

• If labels have EDTA, HEDTA, etc. written on them, they are forms of Chelate, these chelates are designed to protect, for example, trace elements from other elements binding them together once they come in contact with the rootzone,

they help the element stay available for longer.

Most chelating agents (EDTA, HEDTA, etc.) have a molecular size too large to be effectively absorbed by leaf tissue.

- One other reason for a product to be watered in after application is to prevent leaf burn from unwanted residue.
- These types of products are valuable for soil applications, but are far less affective for foliar applications. Do not be mislead, as there is a big difference between leaf applied nutrition, and soil liquid applications.

So, if a container has any of the above written on it, that product is designed for crown and root up-take, and not as a foliar applied product. Soil Liquids are an effective way of providing Nitrogen, Potassium, Organics, Seaweeds, Humic Acids, etc.

Using low volume of water is important for foliar applications.

When applied correctly foliar products provide the course manager with a high degree of control, for a much more accurate way of feeding the plant.

For a cool season grass, the best time to spray is early morning or late evening. These are the times when the stomata are open, and remember to remove any dew.

Two main points to remember when applying a foliar application.



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1. You must have a fine spray mist (small droplet size) to ensure as much of the product stays on the leaf for as long as possible.

2. The total spray volume should be no more than 350lts/ha, ideally 250-350lts/ha

The pH of the spray tank is also important; remember the “ideal” soil pH is around 6.5, as this is where most nutrients are available, so it makes sense to have your spray cocktail at a similar pH.

This is to secure uptake and absorption through the leaves, and will be beneficial if you are applying soil liquids.

You do not want rain or irrigation water within 3 - 4 hours of application. Otherwise the mix could be washed off the leaves.

If your water source has a pH higher than 7.0 use a pH adjuster to increase spray tank efficiency.

Spray nozzles (Tee jet blue type 11003 VS; 2 bar 5 km/h gives 283

L/ha; Hardi blue type 03-110; 3,5 bar 5 km/h gives 310 L/ha)

By applying a foliar fertiliser and certain other elements directly to the grass leaf, it increases the activity in the leaf and plant, at the same time increasing chlorophyll and thus photosynthesis, this is the most important function of the plant.

Because of this increased activity within the plant, it increases the need for water by the leaf. In turn this increases water uptake by the plants vascular system, which in turn increases the uptake of nutrients from the soil.

This shows the importance of both soil and foliar applied fertilisers. The need to maintain the balance of the correct nutrients in the soil, the use of foliar fertilizers can increase their effectiveness, and the plants efficiency at using them.

How does foliar spraying work when common perception is, that plant nutrition is a one-way movement from the roots to the leaves?

A vascular network runs through the leaf, providing the cell walls with water, and removing the food products of photosynthesis, as well as nutrients, to other parts of the plant.

In simple terms the vascular system runs from the roots up and from the leaves down, providing two ways for nutrients to be distributed to areas of the plant.

I believe that the best management approach to maximising nutrient availability is to develop a balanced soil nutrient reservoir, supplemented by regular and strategic foliar applications of nutrients. Managing nutrient levels in this manner provides for linear availability of all nutrients, and allows for precise adjustment to specific nutrient levels being delivered to the plant. It will not produce flushes of growth, which are directly related to increase in disease pressure.

Having a diverse range of application methods, will give the Course Manager far greater control, and accuracy of what is applied and when.

Foliar applications are an excellent way of correcting nutrient deficiencies, and supplying the plants with a small amount of Nitrogen, and other nutrients which are designed to help the plants get going in spring and summer, at a time when soils have the inability to supply nutrients.

Tests have shown that up to 90% of a foliar fed nutrient solution can be found in the smallest root of a plant within 60 minutes of application. A project conducted at Michigan

State University, using radio active tagged nutrients, proved that foliar feeding can be 8 to 10 times more effective than soil feeding, when soil conditions are not favourable. i.e. cold soils, low microbial activity, reduced root system. That is why you need a combination of foliar and granular.

Depending on the quality of product, and if it is a true solution, not a suspension, it can be immediately available in the plant. This makes them perfect for correcting nutrient deficiencies.

It is worth remembering that foliar spraying stimulates the plants to create exudates in the roots which excite microbes to work harder and thus increases nutrient uptake from the soil.

When purchasing foliar products ensure you use high quality, safe, non-toxic fertilisers from a company you trust. A lot of companies are selling fertilizers with, cheap ingredients, low nutrient concentrations, which are not designed to be taken up by the leaf.

You can use foliar nearly any time during the year with great efficiency. It's one of the most efficient and effective methods to deliver many key nutrients.

It does not substitute a granular program, rather work along side, and will improve the overall strength of the plant in periods of stress, i.e. spring, disease pressure, heat stress, nematode attack, autumn/winter prep, etc.

Soil Liquids; Are an effective way of providing liquid soil amendments, some NPK products, seaweeds, humic acids, etc. for the plants to take in by the upper root system. They are still somewhat dependant on temperature, and a healthy root system.

Granular products; Granular nutrition is the main source of NPK, and other bulk amendments to help balance the soil reserves. In order to maximize the efficiency of granular fertilizer you need a number of things to be in order; adequate soil temperature, the correct balance of Oxygen, CO2, Water, and therefore microbial life, and a root system. If any of these are compromised then the efficiency of a granular will reduce.

So by using the correct application method, combined with the right nutrients at the appropriate time of year, this will greatly improve the percentage of nutrition the plants receive, and in the long term be much more cost effective.

Meaning all Greenkeepers & Course Managers can and should have a wage rise!

