While it is uncommon to start a conversation about fertiliser by talking about soil health, the two are so closely linked that it's no longer possible to talk about them as separate concerns.

Simply relying on fertiliser applications to deliver nutrients for growth with no serious consideration for soil health, particularly microbial activity and leeching, may offer a short term gain but would be doing serious damage to the entire system that quality turf relies on in the medium to long term.

Soil quality is a major factor in all aspects of surface management from hydrophobic conditions, weed and pest control through to wear tolerance and consistent growth. A good "quality" soil is one with a rich biodiversity, especially a vigorous soil biota, and a level of friability that allows roots to get well established while water and nutrients to remain mobile.

A robust soil biota archaea features a combination of soil bacteria, actinomycetes, fungi, algae, protozoa as well as larger fauna, hopefully focused around the rhizosphere. This mixture of microbes and organisms process the organic matter and fertiliser through mineralisation which converts a nutrient from the organic to the inorganic form. The organic nutrients, which are bound to carbon and hydrogen, are digested by the soil microorganisms, releasing the nutrient and making it available for uptake.

On highly worked areas like golf courses and sporting fields, a constant cycle of mowing, wetting and drying, fertiliser use and exposure can challenge this biodiversity and far too often the answer is solved with more chemical manipulation or more nutrient applications. Trying to solve overworked soil by working it harder may "get the job done" but only compounds the work in the future.

This is where selecting the best nutrient delivery system needs consideration.

The use of soil based fertilisers, notably the non-homogenous and non-stabilised prills, brings with it pressures like large volumes of water, leaching and fluctuations in pH levels. Take some nitrogen-heavy fertilisers for example. When (upfront?) urea is applied, it starts to undergo a hydrolysis involving moisture and urease enzymes, causing it to break down into ammonia and carbon dioxide. Both these gases will escape to the atmosphere in a process known as volatilisation which can account for up to 30% of the total nitrogen lost until it reaches the soil profile.

Once the urea and other ammonium based nitrogen sources do reach the soil profile, an oxidation process begins called nitrification and bacteria in the profile continue to convert the ammonium to nitrite, continuing volatilisation. These two processes have the effect of changing the charge of the nitrogen to negative where it can be easily leached as it cannot hold onto soil colloids.

This leaching is another major loss of nitrogen, particularly in sandy profiles and where watering is frequent` which can add to environmental pressures and waterway contamination.

The amount of free nitrogen in the soil during this leaching cycle can affect soil pH in a significant way. While constant changes in pH can be detrimental for soil biota, the other factor is nutrient lockup. A more acidic soil sees nutrients like iron and the trace elements becoming available but nitrogen, phosphorus, potassium, calcium and magnesium are effective at neutral or slightly alkaline conditions.

So where some forms of granular fertiliser can make budgetary sense, the downsides to their frequent use can put some red figures in the future problems column. Quite often money and time spent on soil amendment and disease control come from the consequences of purchasing and application decisions made weeks and months in the past.

This is where the benefits of liquid fertilisers come into their own. By delivering nutrients via foliar feeding, it can overcome the limitations of poor quality soils or remove pressure from healthy soils by reducing the amount of nutrients and water it has to process.

Having to try and reconcile the amount of water to be applied to ensure the fertiliser gets into the soil profile while balancing that with the amount of water to ensure surfactants reach the affected areas can be a challenge. By reducing the dependency on the poor soil profiles to deliver nutrients through foliar feeding, more aggressive treatment of the profile can be undertaken while maintaining surface quality.

The homogenous nature of high quality liquid fertilisers ensures each drop is the same and contains the full nutrient compliment. Where a non-homogenous granular fertiliser may contain small amounts of nutrients, the actual amount of prill containing that nutrient may only constitute a teaspoon in a 25 kilogram bag. A teaspoon of prill spread over a few 100 square meters may not ensure availability is equal and this is important for those vital nutrients like trace elements.

One side benefit of nutrient delivery by foliar is as the turf utilises the nutrients and expands, it encourages the root system to expand and balance the water potential, drawing up additional nutrients already in the soil. This promotes stronger growth both above and below the soil, utilises nutrients already present and maintains water movement through respiration which aids the carbon cycle under the soil.

Most of the nutrients contained in high quality liquid fertilisers are plant available at application and the absorption by diffusion begins as soon as the droplets hit the leaf. This is ideal for rapid response to nutrient deficiencies or eliciting fast green up. By selecting high quality liquid fertilisers that have

the right analysis but also the nutrients present in the correct form, managers can see reliable and consistent growth that continues into the future rather than just hitting an analysis on a label.

As you approach the cooler months, it might be worth taking an audit of your nutrient delivery methods and consider adding high quality liquid fertilisers into your program. The cost benefits of moving to higher quality products will be shown in future savings on soil amendment and labour alone. Your soil and your ~~turf may~~turf may just thank you for it.

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