

Management options for N fertilisers

A NUMBER of management options should be considered when applying N (N) fertilisers to turf.

Although soil testing for N is basically a waste of time, the N requirement of the turf must still be met. In most cases, this is a difficult task when the influence of temperature, rainfall and play intensity is considered.

Generally, 500 grams to one kilogram of N for 100 square metres every 30 days has been the recommended application rate for couch growing in a high-sand-content medium.

However, turf managers can choose from several possible strategies to achieve this, and some are better than others are.

Cool-season turf grass species differ in the amount of N fertiliser needed for optimum performance. Kentucky bluegrass and perennial ryegrass typically need 1.5 to 2kg of N/100 square metres a year, but fescues respond best to 1kg N/100 square metres a year.

If Kentucky bluegrass is fertilised with only 0.5 or 1kg N/100 square metres during the entire growing season, it will usually become light-green, thin, and more susceptible to disease damage (rust, dollar spot and red thread). On the other hand, if fine fescue turf is fertilised at more than 2kg N/100 square metres per year, it can become more susceptible to drought, heat stress and leaf spot diseases.

Therefore, the turf manager must

identify the species they are managing and adjust their N fertility program accordingly. In turf containing mixtures of species, the N program can be designed to favour the desired species. Turf grass cultivars also vary in their N needs.

Programs for N fertiliser will vary with soil quality and type. Turf grasses growing on sites with a sandy soil usually require more N fertiliser than turf growing in areas with a higher content of fines.

This is due to the low amounts of N found in poor-quality soils and the fact that N is more easily leached from sandy soils.

Improving poor-quality soil with the addition of organic amendments, such as good-quality compost, can improve soil quality and add nutrients, thus reducing N needs.

Management practices, such as mowing and irrigating, can significantly influence the amount of fertiliser needed by turf grasses. Turf that is frequently irrigated during the summer months will use more fertiliser than non-irrigated turf because it is growing and producing new tillers.

Turf use will also determine the amount of N needed for good turf growth. For instance, turf grasses in high-traffic areas, such as ovals, usually require more N for better recovery from wear than low-traffic areas. High-use athletic fields may need 2.5kg N/100 square metres during the growing season to help with turf recovery from wear.

Low rates of N can be applied to irrigated turf (such as golf course fairways and athletic fields) during mid-summer to promote limited growth and recovery from divots and wear.

The most effective way to restore areas of worn, warm-season turf grass is to use fertilisers with water-soluble N sources. Apply them at low rates (0.125 to 0.25kg N/100 square metres) every two to four weeks during the most active period of growth. If the warm-season turf is over-seeded with

a cool-season grass, such as annual or perennial ryegrass, apply 0.1 to 0.15 kg N/100 square metres every two to three weeks to maintain density and colour.

Regardless of location, the general rule is that the maximum N rate for each application should not exceed 1 kg N/100 square metres.

Understanding nitrogen

The atmosphere contains about 78% N gas, which is the equivalent of more than 74,100 tonnes a hectare.

However, most plants cannot use N as it exists in the atmosphere and it must first be converted through biological or chemical fixation.

Bacteria such as rhizobia live in the roots of certain plants such as legumes and fix N in a form that plants can use.

In the manufacture of chemical N fertilisers, atmospheric nitrogen (N₂) is combined with hydrogen (H₂) to form ammonia (NH₃).

Ammonia can be sold for use as is, or further reacted to form urea or ammonium nitrate.

N reactions relevant to turf include:

- **Ammonification.** This is the conversion of organic N into ammonium by soil microbes. Turf can use ammonium N.
- **Nitrification.** This is the conversion of ammonium N to nitrate N by soil bacteria.
- **Denitrification.** In poorly aerated, water-logged soils, soil bacteria change nitrate N into unavailable atmospheric N.

Contact: This story courtesy of Paton Fertilisers, website <www.paton.com.au>.

Table 1: N requirements of cool season turf grasses.

(kg/100m ² /annum)	
Turf type	N requirement
Creeping bentgrass	1.5-3.0
Kentucky bluegrass	1.5-2.0
Perennial ryegrass	1.5-2.0
Annual ryegrass	1.0-1.5
Tall fescue	1.0-1.5

Table 2: N requirements of warm-season turf grasses.

(kg/100m ² /annum)	
Turf type	N requirement
Buffalograss	0.1-0.2
Common couch	0.2-0.35
Centipedegrass	0.5-0.75
Hybrid couch	0.3-0.75