

Food for thought

Like all forms of life, lawns require feeding but with such a vast variety of products on the market working out what to use, where and when can be confusing. Jerry Spencer of Paton Fertilisers explains the basics.

From a nutritional perspective the primary goal of a landscape manager is to provide a healthy, stress tolerant turf that is able to establish as quickly as possible with the minimum of maintenance.

In order to achieve this, selecting the correct fertiliser regime is highly important as this has a major influence on the health of the lawn. Too much nitrogen and the lawn can become extremely prone to disease attack and have a low tolerance to wear. Too little nitrogen, recovery and growth are limited.

Getting the fundamentals of fertilising turf right is not simply a matter of applying nitrogen, phosphorus and potassium.

The very form of these nutrients applied can play a significant role in the efficiency and effectiveness of the programme adopted, not to mention the timing.

But get the nutritional regime right and it can lead to significant cost savings on pesticides, less disease attack and generally lower call back rates.

There is a wide range of fertilisers available to the landscaper or garden maintenance operator in Australia, all of which possess particular characteristics and properties. They tend to fall into three major categories being straight NPK fertilisers, blended slow release or controlled release NPK fertilisers.

From a landscape perspective straight NPK fertilisers are not necessarily the best to use for reasons such as a high propensity to burn, application tends to lead to 'surge' growth, and also frequent application is necessary.

That leaves slow release or controlled release blended fertilisers and due to space constraints I am going to deal with Nitrogen only fertilisers.

Nitrogen is the essential nutrient that is required in the largest amounts. Nitrogen nutrition affects turf in a number of ways including, shoot growth, root growth, shoot density, colour, disease proneness heat/cold/drought hardiness, and recuperative potential.

The level of nitrogen is directly correlated with the colour and shoot density of turf. A visual reduction in turf colour or shoot density is a common indicator of nitrogen deficiency.

A reduction in the shoot density of turf may favour the encroachment of weeds.

The symptoms of nitrogen deficiency include:

- Colour - older leaves appear as a pale green colour changing to a pale yellow as symptoms develop. In the extreme cases a copper colour develops on the leaf tips.
- Shoot - the plant shoot density decreases and the plants become spindly.

There are three main nitrogen fertilisers used.

These are: Urea (46% nitrogen), Ammonium nitrate (34% nitrogen) and Sulphate of ammonia (21% nitrogen).

Blended fertilisers are produced by blending individual nutrients to form various N:P:K ratios and can offer tailor-made fertilisers for the individual. With compound fertilizers the N: P and K are all in one prill.

Slow release fertilisers

The main advantages of slow release fertilisers are a reduction in nutrient loss as a result of leaching, a reduced number of applications, no 'flushes' of growth, no lush disease prone growth, reduced labour and importantly cost savings.

A number of fertilisers are available in Australia but choosing the appropriate one to use in a particular situation is not an easy decision to make. In order to achieve the correct decision information is required concerning for example their release characteristics.

Slow release Nitrogen fertilisers can be divided into organic and inorganic depending on their origins. Organics available in Australia include products based on poultry manure such as Blackjack®, Mother Earth®, Dynamic Lifter®, Neutrog®, or Terrafirma®. The first two are manufactured from recycled food waste whilst the remainder are just basically pelleted manure, which is either heat-treated or composted to remove excess moisture that can vary from 8-16% depending on the brand and manufacturing process used.

Typically they have Nitrogen contents of around 3% in the case of poultry manure and 5% in the case of Mother Earth® and Blackjack®. Release is controlled by microorganisms, which in turn are controlled by temperature and soil moisture.

Growth response is expected over five weeks.

Synthetic slow release fertilisers have been introduced to overcome the disadvantages that organic forms possess, in particular unpredictable release. There are three main groups of synthetic slow release nitrogen fertilisers:

Synthetic organic nitrogen compounds.

Inorganic fertilisers treated to decrease their solubility.

Products containing nitrification inhibitors.



lawn fertilisers

Ureaformaldehyde based fertilisers

The Nitrogen availability from ureaformaldehyde based slow release fertilisers can be divided into four segments based on release time.

| Type of release | Approximate length of release (weeks) | Fraction |
|-----------------|---------------------------------------|-------------------------------------|
| Fast | 2-3 | Cold Water soluble Nitrogen (CWSN) |
| Moderately fast | 3-5 | |
| Slow | 5-9 | Hot Water soluble Nitrogen (HWSN) |
| Very Slow | 7-10 | Hot Water Insoluble Nitrogen (HWIN) |

IBDU (Isobutylidene diurea)

The rate of nitrogen release is governed by the amount of moisture present and particle size. Nitrogen release rate increases as particle size decreases. IBDU is generally available in coarse, fine, and powder grades. Because temperature has less influence on IBDU than on other nitrogen sources, the product gives good winter and early spring colour when temperatures are cooler.

Principle N-Release Mechanisms for slow release fertilisers

| | |
|--|---|
| Slow dissolution (slow hydrolysis IBDU, CDU) | Particle size; soil moisture, temperature with 2-3 times release at 27 versus 10°C, pH sometimes |
| Microbial Degradation (Ureaformaldehyde, Methylene Urea) | Soil temperature (<13°C) temperature with 10-12 times release rate at 27°C versus 10°C; large particle size, low pH, low soil O ₂ all limit release. Simple compounds release before complex ones |
| Sulphur Coated Urea | Coating thickness and coating quality, temperature |

Slow release liquids

Increasingly these are becoming more commonly used as although they are not especially cheap they offer exceptional ease of use coupled with low burn potential. Good examples would be Sirflor® Liquid.

Controlled release Fertilisers

With controlled release fertilisers the principal procedure is one by which soluble fertiliser is given a protective coating or encapsulation (water insoluble, semi-permeable or impermeable with pores), controlling water penetration and thus the rate of dissolution, and nutrient release synchronised to the plants needs.

They have a number of advantages that include being environmentally beneficial as they reduce leaching and the volatilisation of fertiliser salts into the surrounding environment. They reduce toxicity and offer a high degree of safety. This is especially the case with seedlings thus offering a high level of agronomic safety in hot conditions. They are invaluable from a management point of view in that 'they are easy'. Generally once applied they can meet the plants entire nutrient

requirements and be left alone.

On the downside, however, in some instances the application of controlled release fertilisers may lead to an increase in soil acidity and the possibility exists that in turf situations mower 'pick up' can occur.

There are three commonly used 'coatings': sulphur, polymeric/polyolefin materials and combination products.

One of the key disadvantages of controlled release coated products is their cost but increased safety is also important coupled with longevity. From an economic point of view, coating materials with sulphur in combination with polymeric material results in their being much more economically competitive.

Putting it all into Practice

Having determined which type of fertiliser is best for the situation, there are still a number of factors that should be taken into consideration before application.

Not all grasses are the same and in the turf industry the choice can be either warm or cool season grasses depending on the situation of the site.

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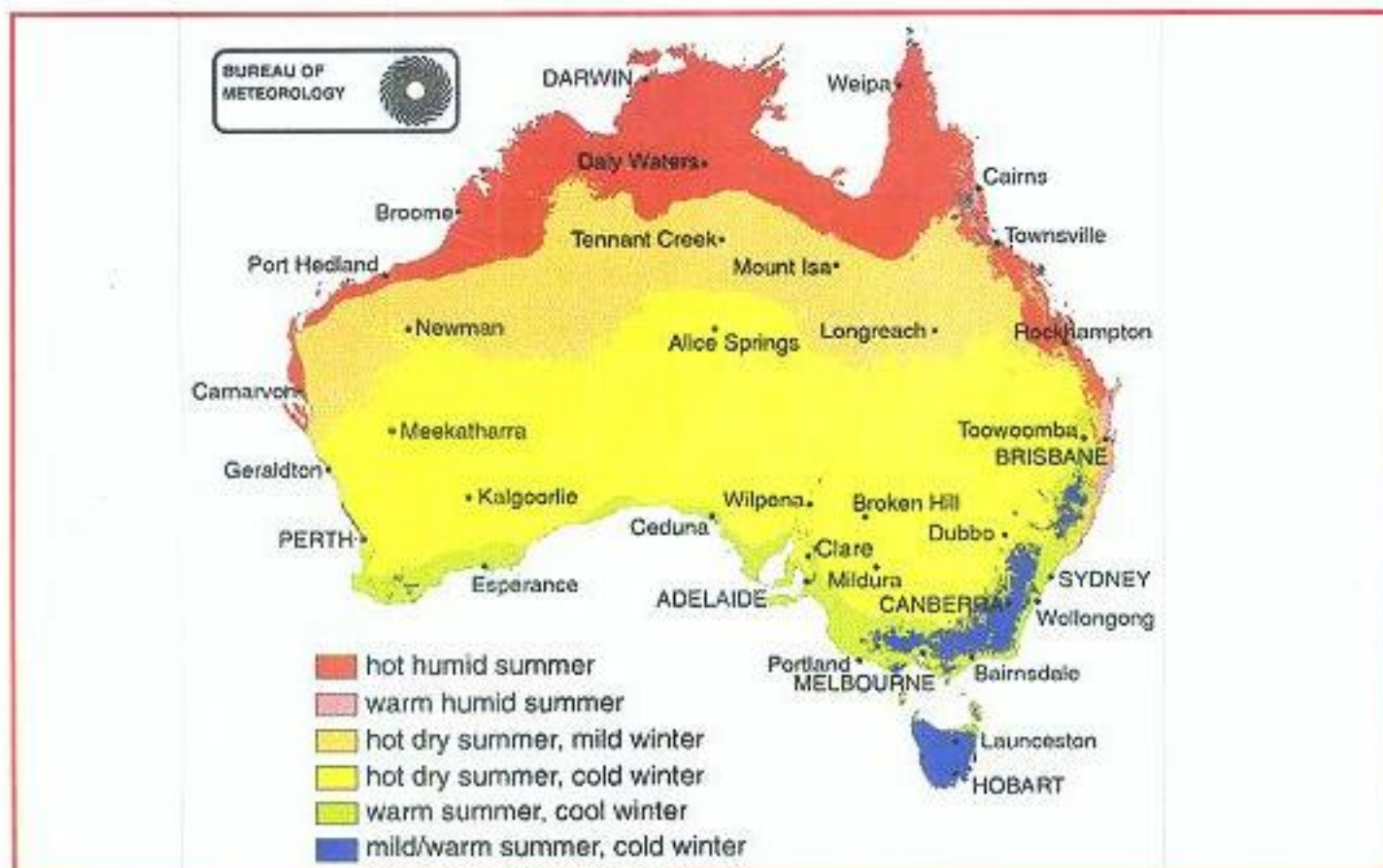
Grass species

Cool season grasses include bent grass; perennial ryegrass and fescue grasses and these have differing nutrient and pH demands in contrast to the warm season grasses such as couch grass or kikuyu. See Table.

| SPECIES | SALT TOLERANCE | SHADE TOLERANCE | SOIL pH | NITROGEN REQUIRED |
|-----------------------|----------------|-----------------|---------|-------------------|
| Couch | Medium | Poor | 5.5-7.5 | Medium |
| Queensland Blue couch | Very good | Poor | 5.5-6.5 | Medium |
| Buffalo | Medium | Excellent | 6.5-7.5 | Low |
| Kikuyu | Very good | Poor | 6.0-7.0 | High |

Timing of fertiliser applications

But matching the variety of grass to the fertilizer is not so much of an issue as matching the fertilizer to the seasonal conditions at the time it is applied. This is crucial and has a huge influence on the programme to adopt. Basically the considerations can be divided into pre and post establishment and this in turn is influenced by location within Australia.



Map shows the range of climatic zones within Australia. It can be seen that a wide range of macro and microclimates exist and these all have a direct influence.

In cooler weather a slow release fertilizer such as IBDU can prove highly beneficial or alternatively use 'straights'. If the decision is between both of these as a general rule remember: The sandier the soil the more likely a slow release fertilizer will give better comparative results. In warmer climates in areas of relatively high rainfall the best option is to use either a

methylene urea based fertilizer, one based on Sulphur coated urea or else one based on Polymer coated technology such as Multigreens®/Multicote®.

The latter can offer longevities of on average 4 months which means only three applications might be needed at most over a year! ■ For more information call - 02 4729 2888.