

# FERTILISING SPORTING FIELDS (New South Wales)

## INTRODUCTION

Sporting fields vary considerably in their use and management, from major sporting venues that are used throughout the year on a weekly basis, to suburban parks. Some are managed on a professional basis, while others are tended to by volunteers and others without specific training and skills.

This Agritopic is intended for the latter, and provides basic information on the management of playing fields in suburban areas. Basic fertiliser programs are provided. Proper fertilisation, of course, is just one of a number of key management factors to consider in taking care of sporting fields.

## 1. GRASS SPECIES

Various grass species and cultivars are available, and professional advice should be sought on the best grass to use if establishing or laying down a new playing field. Historically, the main species used in the sub-tropics where good rainfall is received over the summer months are Green or Common Couch (*Cynodon dactylon*) and Queensland Blue Couch (*Digitaria didactyla*). These are mainly spring/summer growing species.

Where football is played, sporting fields are subject to greater wear and tear, and more punishment during the winter. Couch grass should be properly fertilised in summer and autumn so that it can carry through the winter. Oversewing with winter growing species, such as Rye Grass, should also be considered.

## 2. WATER

While many playing surfaces rely on natural rainfall and do reasonably well, a supplementary watering system is really necessary to ensure top playing surfaces, especially where winters tend to be dry.

Water should be applied as soon as the grass begins to wilt. The watering or irrigation system should be capable of watering the whole field in 1 - 2 days, supplying up to 25 mm per watering. Over-watering should be avoided. If the quality of the water is unknown, particularly if it is to be pumped from a bore or well, it should be checked by chemical analysis to make sure it is not salty or sodic.

### 3. MOWING

The use of a well-set and sharpened mower to produce strong, healthy turf is so often overlooked. Fields should be mown at least once a week through the main growing season. Clippings should not be collected or removed from the field. With regular mowing, they will quickly break down to return nutrients to the soil and build-up organic matter. If the grass sward is rank, however, the clippings, which will be present in large amounts, should be removed to avoid any impediment to new grass growth

Mower height should be set at 15 - 20 mm at a minimum. Mowing lower simply shaves the turf and prevents the build-up of a dense thatch and good surface. Most troublesome weed species are unable to withstand regular mowing of turf which is both properly watered and adequately fertilised.

### 4. DRAINAGE

A top playing surface requires a good underground drainage system and evenly spread sandy topsoil. Poorly drained and compacted fields make good turf growth virtually impossible, and also subject to a lot more damage when sport is played under wet conditions.

Soils with a poor physical structure (such soils usually have a high clay content, are often found in low-lying areas, and are characterised by poor water penetration, aeration and drainage) are likely to respond to heavy applications of gypsum, at 5 t/ha, which acts as a soil amendment. Gypsum is slow to take effect. It is best applied in conjunction with slicing or aeration (renovation) to help incorporate it into the soil, followed by a minimum of 50 mm of irrigation (or rain).

### 5. pH, and SOIL ACIDITY/ALKALINITY

pH is a measure of the soil's acidity or alkalinity. It is measured over a range from 0 - 14, pH 7 is neutral, less than 7 is acid and greater than 7 is alkaline. Soils commonly lie in the range from pH 5.0 to 8.5. A pH range from 6.0 to 7.0 is optimum, though most grasses are tolerant and will grow quite well outside this range.

When soils are too acid, lime (or dolomite) can be used to increase the pH. The amount of lime required depends on the degree of acidity, the target pH and the soil type. A typical rate is 2.5 t/ha.

### 6. PLANT NUTRIENTS

The main nutrients applied in fertiliser programs are nitrogen (N), phosphorus (P), potassium (K) and sulfur (S). These are discussed in more detail below.

## Nitrogen

Lawn grasses take up nitrogen continuously and in greater quantity than any of the other nutrients. Nitrogen is an important constituent of protein and chlorophyll, the green pigment which gives colour to plants. Chlorophyll is essential for photosynthesis, the process by which green plants utilise the energy from the sun. Nitrogen deficient plants will be a pale green to yellow colour, and lack vigour.

Fertiliser-N is quite mobile in the soil. It can be leached or washed through the soil, beyond the root zone of the grasses, if heavy rain is received and/or excessive irrigation water is applied. For this reason, it is best to apply N fertiliser on a number of occasions each year, than to apply it in a single application.

The colour and growth of the grass can be used as a guide to when it is necessary to re-apply N. Nitrogen fertilised grass will be a dark green colour, and make rapid growth, provided other factors, e.g. moisture, temperature, are not limiting.

## Phosphorus

Plants need quite large amounts of phosphorus, but not near as much as nitrogen. It is important for root development, particularly at the start of the main growing season, or if the field has been over-sown. Unlike N, P is rarely lost from the top soil through leaching, so a single application per annum is all that is required. However, it is customary to apply it (purely as a matter of convenience) on several occasions during the year in combination with N and K.

## Potassium

Potassium is taken up in fairly large quantities by plants, second only to N. It plays a major role in plant growth and water relations within the plant, and increases vigour and disease resistance. Like nitrogen, it is subject to leaching, but not quite to the same extent. Where required, it is customary to split-apply it, in combination with N. Potassium is most likely to be required on sandy soils, and where grass clippings are removed from the field. Potassium may not be needed on heavier-textured loam and clay soils.

## Sulfur

Like N, S is required for the manufacture of protein and is needed throughout the plant's life. It is required in about the same amount as P. Most complete NPK fertilisers used to fertilise playing fields contain sulfur, so deficiency does not commonly occur. Sulfur is not always required in fertiliser programs, with variable amounts being received in rain, and some bore waters. The amount that falls in the rain is greater in cities and near the sea.

## 7. FERTILISER PRODUCTS

The analyses of the fertiliser products referred to in this publication are shown below.

PRODUCT	ANALYSIS (%)				USE
	N	P	K	S	
Complete Mix 1	7.6	9.5	9.6	8.6	Planting and establishment.
Grower 11	9.6	14.5	9.5	4.6	
NPKS 11-15-14-1	11.0	14.9	14.0	1.1	
Multigro	13.1	4.5	7.2	15.4	Topdressing established fields.
Complete Mix 3	10.5	5.0	10.3	16.8	
Complete Mix 7	14.6	3.0	7.1	17.2	
Nitrophoska Special	12.0	5.2	14.1	8.0	
Granular Urea	46				

Incitec Pivot Complete Mixes 1, 3 & 7; Grower 11, NPKS 11-15-14-1 and Multigro are blended fertilisers.

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## 8. ESTABLISHMENT

The use of a fertiliser with a high phosphorus content, compared to that used on established fields, is recommended when establishing a new playing surface. The phosphorus helps establish a strong root system. Apply any one of the following products prior to sowing new grass species or laying down turf, and work into the soil:

- Complete Mix 1 at 350 – 450 kg/ha; or
- Grower 11 at 300 kg/ha; or
- NPKS 11-15-14-1 at 250 - 300 kg/ha;

If gypsum or lime is required, it should be applied as far ahead of establishment as possible, while the ground is being worked up, preferably 3 to 4 months before planting.

## 9. MAINTENANCE

The type, rate and frequency of application of fertiliser will depend on many factors, including financial budgets, the intensity of use made of the sporting field, climate, rainfall, irrigation, soil type, and whether grass clippings are removed or returned to the field. Returning the clippings helps recycle nutrients and maintain soil organic matter levels.



Complete NPK fertilisers such as Incitec Pivot Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special, which are high in N and K and lower in P, are popular top-dressing fertilisers for playing fields.

As a basic program for couch grass fields, it is recommended that one of these products be applied on three occasions each year, in September, December and March, at 300 kg/ha per application. In favourable rainfall areas and where irrigation is available, supplementary applications of nitrogen as Incitec Pivot Granular Urea may be made between these applications, particularly if the field is lacking vigour, i.e. in late October, January/February and the late autumn (mid-May), at 100 kg/ha per application.

In summary, a fertiliser program for a fully irrigated sporting field planted to couch or other summer active grass species may be as follows, although depending on circumstances, some of these applications may be left off.

Time	Product	kg/ha
September	Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special	300
Late October	Incitec Pivot Granular Urea	100
December	Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special	300
January-February	Incitec Pivot Granular Urea	100
March	Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special	300
Mid-May	Incitec Pivot Granular Urea	100

It is best to water the fertiliser into the soil. Where possible, this should be done soon after fertilising and on the day of application. Fertiliser granules and dust that lodge on plant leaves may dissolve in overnight dew and burn the foliage.

Applying fertiliser when rain is forecast may avoid the need to water the fertiliser in, provided enough rain falls to wash the fertiliser from the foliage into the soil. 10 mm of rain in the one fall should be adequate for this to occur. Light rain or showers will have the same effect as dew, enough to dissolve the fertiliser but not enough to wash it off the leaves and into the soil.

Fertiliser should be applied to dry grass. The risk of leaf burn is increased if fertiliser is applied to wet grass, causing the fertiliser to stick to rather than fall through the foliage, and no further rain is received.

Watering the fertiliser in also minimises the risk of any gaseous N losses to the atmosphere, which can occur after the surface application of many N fertilisers. It also avoids the risk of accidental ingestion by children, pets or wildlife.

## 10. OVER-SOWING

In the above fertiliser program, fertiliser is applied on a less frequent basis over the cooler months of winter, as grass growth from summer active species such as Couch is slowed at this time of year. Couch grass grows more slowly over winter, and is less responsive to N fertiliser at this time.

Football fields may be over sown with winter active grasses, such as Rye Grass, to provide better playing conditions over the winter months, and in spring. Before doing this, the turf should be lightly cultivated, e.g. with weighted harrows, and fertilised with a complete NPK fertiliser.

Apply one of the scheduled applications of Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special before planting. If the soil is low in phosphorus, substitute a fertiliser with a higher phosphorus content for these products, e.g. Complete Mix 1 at 350 – 450 kg/ha; Grower 11 at 300 kg/ha; or NPKS 11-15-14-1 at 250 - 300 kg/ha. After watering the fertiliser into the soil and providing a moist seedbed, the Rye Grass can be sown. Water lightly until the Rye Grass is up and away. Apply an additional application of Multigro, Complete Mix 3, Complete Mix 7 or Nitrophoska Special at 300 kg/ha during the winter months.

## 11. PETS AND WILDLIFE

While the risk is slight, the ingestion of freshly-applied fertiliser may affect the health of animals and wildlife, and in isolated incidents result in deaths. If practical, it is best to remove grazing animals from areas being fertilised, and not to readmit them until after rain is received or irrigation applied, and regrowth occurs. This minimises the risk of direct ingestion of fertiliser, and nitrate poisoning in young regrowth where N fertilisers are used.

## 12. AREAS

A hectare (ha) is 10,000 m<sup>2</sup> (square metres). It is best visualised as a 100 m square, i.e. an area of 100 m by 100 m.

A field with the dimensions of 100 m by 50 m is 0.5 ha.

### WARNING

Before using fertiliser seek appropriate agronomic advice. Fertiliser may burn and/or damage plants.

Because climatic and soil conditions, application methods, irrigation and management practices are beyond the control of Incitec Pivot Fertilisers and cannot be foreseen, Incitec Pivot Fertilisers accepts no responsibility whatsoever for any injury, damage, loss or other result following the use of advice and fertiliser programs detailed in this publication, whether used in accordance with directions or not, subject to any overriding statutory provision and provided that such liability under those provisions shall be limited to the replacement of goods as supplied or the rendering again of services provided.

Specialist advice should be sought on the control of weeds, insects and disease.

The reader accepts and uses this information subject to these conditions.