

FERTILISING PASTURE ON ACREAGE AND SMALL HOLDINGS (Qld and Northern NSW)

INTRODUCTION

This Agritopic gives basic information on fertiliser programs for improved pasture in the coastal and tableland areas of northern New South Wales and Queensland. Pasture and livestock management are complex, and if a detailed knowledge is not held on both, advice should be sought. Publications on these topics are available from State Departments of Agriculture / Primary Industry.

Where livestock, e.g. cattle and horses, are run on small blocks, reliance on purchased feeds can often be reduced with pasture improvement and the use of fertilisers, usually at a reduced cost. Depending on the number of stock to be carried, it may not be necessary to improve or fertilise the whole block. In these situations, or if finance is a constraint, it will probably be best to concentrate on part of the block, and do it properly, rather than spread seed and fertiliser at less than optimum rates over the entire farm. If only part of the property is to be developed, choose that with the most productive pasture species, the deepest and most fertile soil, or that closest to water if irrigation is envisaged.

1. FERTILISER ANALYSES

The analyses of the Incitec Pivot products referred to in this publication are:

Incitec Pivot Product	%N	%P	%K	%S
Granular Urea	46			
SuPerfect		8.8		11
Muriate of Potash			50	
Starter 15	14.3	12.9		10.7
CK 88®	15.1	4.4	11.5	13.6

2. PASTURE SPECIES

Most native pasture species do not respond well to fertiliser. If naturalised clover and/or other introduced species are not present, improved grasses and/or legumes will need to be introduced to allow the full benefits of fertiliser (improved quality and quantity of pasture) to be achieved.

Seek advice, e.g. from local Seed Merchants or Produce Agencies, or from Department of Agriculture/Primary Industry publications, as to the most suitable species for your area, soil type and grazing management. Make sure legume seed is appropriately inoculated before planting.

3. STOCKING RATES

In most coastal and tableland areas, sufficient rainfall is received to support a legume. Legumes, e.g. clover, fix their own nitrogen from the air through nodules on their roots. Consequently, nitrogen fertiliser is not usually required in grass legume pastures. Legumes will not persist at stocking rates above about a beast to the hectare, or if other nutrients are lacking. Higher stocking rates can be achieved through the use of nitrogen fertiliser on improved grass pastures in higher rainfall areas and where irrigation is available.

4. LEGUME BASED PASTURES

Most Australian soils are low in phosphorus, exceptions being alluvial and some basalt soils. High rates of phosphorus are recommended initially when establishing a new pasture, to build up soil phosphorus concentrations to a more acceptable level. Thereafter, lower annual maintenance rates can be used when topdressing. Appropriate soil testing is always the best starting point. Details about soil testing can be found via this link: <https://www.nutrientadvantage.com.au/>.

Where phosphorus is low in coastal areas, apply Incitec Pivot SuPerfect at 375 - 500 kg/ha for the first two years. Thereafter, apply SuPerfect at 250 kg/ha per annum.

In drier less favoured rainfall areas where pasture improvement is still feasible, but the carrying capacity is lower, superphosphate rates may be reduced to about one half of those used in coastal areas, i.e. annual topdressings of Incitec Pivot SuPerfect at 125 kg/ha. Incitec Pivot SuPerfect (Single Superphosphate) supplies phosphorus (P) and sulfur (S), both of which are important in pasture.

Molybdenum (Mo), a trace element, is important to *Rhizobium* bacteria, which fix nitrogen (N) in the nodules on the roots of legumes. Not only is this important to the legume, the nitrogen that is returned to the soil in plant residues, dung and urine enriches the soil, which in turn allows grasses to grow better, resulting in a balanced productive grass legume pasture.

Incitec Pivot SuPerfect Mo 0.025% should be used in place of ordinary SuPerfect in the first year, and thereafter every third to fifth year on legume-based pastures, to supply molybdenum.

Potassium (K) is unlikely to be required on loam and alluvial soils, but may be needed on light-textured sandy soils. Where used, a typical application rate for Incitec Pivot Muriate of Potash is 50 kg/ha per annum.

In clover-based pastures, the most common time at which fertiliser is applied is the autumn, prior to the main clover-growing season.

After the first few years, when the soil's phosphorus status has been built up to an acceptable level, pastures can be top-dressed in either the autumn or spring.

5. NITROGEN FERTILISED GRASS PASTURE

Introduced grass species such as Kikuyu, Rhodes Grass, Pangola & Signal Grass are responsive to nitrogen fertilisers when moisture conditions are favourable for growth. This may allow higher stocking rates to be sustained. Couch grass will also respond well to nitrogen.

A typical nitrogen application rate, over the course of a year, is 180 kgN/ha. This can be split into three applications at 60 kgN/ha, e.g. Incitec Pivot Granular Urea (46% N) at 125 kg/ha/application. Urea is the most economical of the commonly used nitrogen fertilisers. Green Urea NV™ is treated with a urease inhibitor and is known as an Enhanced Efficiency Fertiliser (EEF). It is best used in situations where conventional granular urea is prone to volatilisation losses.

As summer active grass species such as Rhodes Grass do not grow well over the winter months, it is customary to apply nitrogen in early spring (September), the early summer (December) and again in late summer (March).

How much of the property is fertilised with nitrogen will depend on how much feed is required, and the number of stock carried. There is little point in applying nitrogen fertiliser if the number of stock on the property can be supported with a grass legume pasture, and with no need to buy in extra feed. Applying too much nitrogen fertiliser at low stocking rates can result in the pasture growing rank and being under-utilised.

At high stocking rates, growing extra feed in the paddock is normally more economical than buying in supplementary feed such as hay and grain. The use of fertiliser may allow such expenditure to be reduced, helping cut overall feed costs.

If the event that finance is limited, or the whole property does not need to be fertilised with nitrogen to provide adequate feed, it is better to concentrate on part of the farm and fertilise it properly, rather than fertilise the whole property at a sub-optimal rate. Select the area of best soil and pasture for any such development, leaving the poorest areas until last.

Subsequent applications of nitrogen should be made to this same area, rather than to different parts of the property, i.e. once an area is chosen for pasture improvement and fertilisation, stick with it. Part of the property can be devoted to a grass-nitrogen system, and the remainder to a grass-legume pasture.

When nitrogen fertiliser is applied, only part of it goes towards leaf production, which grazing animals can utilise. Some is tied up by microorganisms in breaking down decaying plant roots and litter, while the grass itself will utilise some of the nitrogen in strengthening its runners and root system. This is particularly true for grasses that form a sward. If too little nitrogen is applied, a good part of it will be utilised for these purposes, and less left over for leaf production, which stock can graze. For these reasons, responses to nitrogen can be disappointing if it is applied irregularly and/or at low rates, i.e. less than 50 kg/ha N on grass pastures.

Once the sward has properly established and thickened, responses to subsequent applications of nitrogen generally improve, as more of the applied nitrogen is directed to the leaves.

To help maximise the utilisation of the nitrogen by the pasture, and to minimize any gaseous losses of nitrogen to the atmosphere following application, nitrogen fertiliser is best applied when the prospects of rain are high, or the pasture is about to be irrigated. An even better option is to apply Green Urea

NV™. Green Urea NV reduces volatilisation losses during the initial 14 day timeframe, when volatilisation risk potentials are at their greatest.

Nitrogen is not the only nutrient that may need to be applied in fertiliser programs on improved grass pastures. All the nutrients that are important in legume-based pastures will still be required in nitrogen fertilised grass pastures, except for molybdenum. Molybdenum itself will be required when there is a legume component to the pasture.

Phosphorus and sulfur are likely to be needed, and can be applied as Incitec Pivot SuPerfect at 250 kg/ha in either the autumn (if the pasture has a clover component) or spring (for summer active grasses).

Alternatively, phosphorus and sulfur can be applied as Starter 15 at 175 - 200 kg/ha in the spring, and the rate at which urea is applied at this time reduced to 50 - 75 kg/ha, this allows for the nitrogen that is applied in the Starter 15. Urea will still need to be applied at 125 kg/ha in the early summer (December) and again in late summer (March).

If potassium is required, e.g. on light-textured and sandy soils, it can be applied as Muriate of Potash. A typical rate is 50 - 100 kg/ha per annum. This can be applied in a single application, again in the spring or it can also be applied as a fertiliser blend which contains nitrogen & phosphorus.

Alternatively, Incitec Pivot CK 88 can be applied at 500 kg/ha in the spring to apply nitrogen, phosphorus, potassium and sulfur; and Urea on its own at 125 kg/ha on two other occasions during the year, i.e. early summer (December) and again in late summer (March).

6. WITHHOLDING PERIOD

While the risk is slight, the ingestion of freshly-applied fertiliser with pasture may affect the health of grazing animals and wildlife, and in isolated incidents result in deaths, e.g. from urea poisoning, fluorosis from the fluorine present as an impurity in phosphorus fertilisers, or induced copper deficiency where molybdenum is applied.

High nitrate concentrations in the first green pick after applying nitrogen fertilisers also poses some risk of nitrate poisoning, and sudden deaths.

While it may not always be practical, e.g. if the property is not fenced into separate paddocks, it is best to remove stock 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 by grazing animals, and nitrate poisoning in young regrowth where nitrogen fertilisers are used.

A Fact Sheet on "Withholding periods after applying fertiliser to pasture" is available in which these issues are discussed in more detail.

WARNING

The information contained in this publication is for use as a guide only. The use of fertilisers is not the only factor involved in producing a productive pasture. Local soil, climatic and other conditions should also be taken into account, as these could affect pasture response to applied fertiliser. Before using fertiliser, seek appropriate agronomic advice. Fertiliser may burn and/or damage plants, and affect the health of grazing animals.

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