

Fertiliser - How Low Can You Go This Year?

Farmer Forum - Modella - 1 April 2009

A trimmed fertiliser budget for 2009 will be essential - but how low you go will depend on the individual farm (or parts of the farm) given that soil fertility varies across all farms along with the responsiveness of pasture species.

- Certainly a 'zero' application of fertiliser on a dairy farm this year is not an option.
- "Minimising maintenance' applications is likely to be the option that will work for most people.
- Application of 'capital' nutrient is unlikely to be an option this year - unless soils on the farm are severely depleted.

To maximise pasture production for the rest of 2009 prepare a trimmed feed cost budget or at least have a good realistically estimated budget. A checklist for putting priorities on nutrient expenditure is outlined below.

In addition to having the trimmed budget pull out any soil tests taken within the last 5 years. If you don't have any soil tests it is not too late to sample and have them analysed. Draw a farm map with the paddocks you consider to have reasonable fertility marked - through to the ones considered least productive over the last couple of years.

1. Fertiliser Guidelines - *Bare bones for 2009!*

N (Nitrogen)

Nitrogen is the major nutrient required by plants (4% of plant tissue is nitrogen). This is the key nutrient to maximise plant growth and needs to have plenty of funds allocated to it this year. Three good rules of thumb are:

1. If there is sufficient moisture in the soil for plant growth, nitrogen can be applied.
2. Pastures utilise nitrogen at the rate of approximately one kilogram nitrogen/ha/day.
- 3..Some pastures may only receive nitrogen or nitrogen/phosphorus blends this year.

Nitrogen is available in various forms, ie urea, liquid nitrogens, as a component of DAP and MAP and as a component of fowl manure.

Nitrogen in the form of urea provides flexibility, can also be combined with various phosphorus and potassium blends depending on other applications during the year. It is likely that in most situations urea will be the most frequently applied source of nitrogen.

2. Guidelines to Apply Nitrogen

The most likely key times to apply nitrogen are outlined below in this case using urea as an example. (These are a guide they may be applied to part of the farm only, or progressively to all areas - over three or four weeks).

Spacing the applications might help spread costs, as well as the response period.

- Start three weeks after the autumn break - apply 80kg/ha (supplies 36kg N/ha).
- Late May early June - apply 80-100kg/ha (supplies 36-46kg N/ha).
- Mid to late August - apply 80-100kg/ha (supplies 36-46kg N/ha).
- Third week in October - apply 80kg/ha (supplies 36kg N/ha).
- Early December (if there is good soil moisture for plant growth) - apply 80kg/ha (supplies 36kg N/ha).

Expected minimum nitrogen responses are likely to be:

- Late Autumn - Winter 10kg DM from each 1kg N applied (on healthy actively growing pastures 14 to 1 could be expected),
- Spring 28 to 1 (on productive healthy pastures 45 to 1 has been gained in the last couple of years).

Note: Use dairy effluent where possible (using the lowest cost application method available).

3. Guidelines to Apply Phosphorus, Potassium and Sulphur

P (Phosphorus)

Low	20kg/ha (50% in autumn)
Marginal	15kg/ha (60% in autumn)
Moderate	
High	10kg/ha (75% in autumn)

Phosphorus is a critical element for both existing pastures and sowing/oversowing in Autumn. It has a particularly important role in developing the root system. The more active and larger the plant's root system is the greater the opportunity for that plant to explore for nutrients in the soil.

K (Potassium)

Low	50kg/ha (20% in autumn)
Marginal	40kg/ha (10% in autumn)
Moderate	
High	30kg/ha (no autumn application)

Potassium - pastures are mainly responsive to this element in spring. If soil tests show low levels, a low application rate prior to spring could well be justified.

S (Sulphur)

Low	20kg/ha (50% in autumn)
Marginal	15kg/ha (60% in autumn)
Moderate	
High	10kg/ha (75% in autumn)

4. Trace elements.

Unless you have evidence that these are desperately required it's hard to justify their application this year. Talk to your farm vet about any animal health related issues.

Note: Make sure you maintain inclusion of any trace elements with grain or pellets as fed in the past.

5. Lime.

Unless you have soil test results showing a need for lime, or you are sowing down a pasture it's hard to justify any application this year, despite the fact that its price per tonne spread is low compared with other soil inputs.

6. Soil Test Interpretation Guidelines

a) Phosphorus (P) mg/kg - Olsen Test method.

Low	Below 12
Marginal	12 – 15
Moderate	15 – 20
High	Above 20

b) Potassium (K)

Colwell Test Method Potassium (K) mg/kg				
	Sand/Sandy Loam	Loam	Clay	Peat
Low	<80	<120	<130	<250
Marginal	80 – 120	120 – 180	130 – 200	250 – 350
Moderate	120 – 200	180 – 300	200 – 350	350 – 600
High	200+	300+	350+	600+

Where Available Potassium levels are not shown it is usual to display Potassium (K) as meq K/100g. To calculate an Available K value multiply these results by 391 to get the Available figure.

c) Sulphur (S) mg/kg – KCl 40 Test method.

Low	< 8
Marginal	8 - 12
Moderate	12 - 14
High	14 +

d) Soil pH, Iron, and Aluminium:

This is a measure of the acidity-alkalinity in the soil, and one of the indicators of the need for lime when sowing/renovating a pasture or sowing a crop. As a guide when the pH of soil is pH5.3water method or 4.7CaCl₂ method and above there is unlikely to be a benefit from applying lime provided soil iron, aluminium and molybdenum levels are satisfactory for soil/plant needs. When sowing a pasture an application of lime is of benefit at soil pH levels below pH6.0water or 5.3CaCl₂

Other indicators of the need for lime are high Reactive Iron (Fe) levels. eg above 3000mg.kg, and high available Aluminium (Al). eg when Aluminium % of cations are above 6.5%. High levels of Iron or Aluminium in the soil can “fix” or convert phosphorous in the soil into an unavailable form to plants. Again it is hard to justify expenditure on lime this year to reduce Iron and Aluminium availability unless it is a chronic problem.

e) Organic Carbon

Organic Carbon is related to the organic matter in the soil. Organic matter is:

- A build up of partly decayed plant and animal residues.
- Adds nutrients and assists in improving soil structure.
- The greater the organic matter there is in a soil the higher the capacity for storage of plant nutrients that can potentially become available for plant growth. If a soil is low in organic matter, the soil test results will indicate a low organic carbon level.

7. Plant Nutrient Sources - March 2009

	<u>Analysis</u>			
	<u>N%</u>	<u>P%</u>	<u>K%</u>	<u>S%</u>
Superphosphate (Superfect)	-	8.8	-	11.0
Superfect-Potash 1:1	-	4.4	25.0	5.5
0-6-32-7 Pasture Gold B MOP (1&1)	-	5.9	32.0	6.9
Superfect-Potash 2:1	-	5.9	16.7	7.3
0-8-25-10 Pasture Gold B MOP (2&1)	-	8.3	24.5	10.1
Superfect-Potash 3:1	-	6.6	12.7	8.2
0-10-20-12 Pasture Gold B MOP (3&1)	-	10.0	19.5	11.9
Superfect-Potash 4:1	-	7.0	10.0	8.8
0-11-15-14 Pasture Gold B MOP (4&1)	-	11.5	15.0	13.7
Superfect-Potash 5:1	-	7.3	8.3	9.2
0-12-14-14 Pasture Gold B MOP (5&1)	-	11.8	13.6	14.6
Hay Booster	11.7	4.7	23.9	4.6
Pasture Booster	23.8	3.7	13.0	4.1
Urea	46	-	-	-
DAP	18	20	-	1.6
MAP	10	21.9	-	1.5
Fowl Manure - Broiler Shed	3.35	2.01	1.96	0.61
Moisture 28% Range (12-50%)	(2.6-4.4)	(1.1-2.7)	(1.4-2.3)	(0.42-0.88)
Foliar/Fish based sprays (applied 5 litres/ha)	3.5	0.3	0.3	0.16

In November 2009 it will be essential to reassess how the pastures have performed and start making plans for fertiliser applications in 2010. This might include getting a couple of strategic soil tests done.

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