BALLANCE NEWSLETTER

Consultants'








SEPTEMBER 2007

Welcome

Welcome to the spring 2007 issue of the Ballance Agri-Nutrients newsletter for consultants. Since the last newsletter prices for fertiliser have increased once again. Some of the reasons for these increases are discussed in an article in this newsletter.

With prices rising, it is even more important to choose a fertiliser that is right for the economic and environmental sustainability of the farming operation. There are many factors that come in to this decision, including the potential effects the fertiliser may have on animal health and plant health. Two articles in this newsletter address these issues, with respect to SMCO formation in brassicas and salt injury in seedlings.

Ballance has also added a new product to its list in recent times. This is Ballance Avoca Dicalcic. The key characteristics of this product are presented in this newsletter.

In addition, this newsletter contains a practical and helpful checklist of some of the important seasonal concerns regarding nutrient management and animal nutrition.

If you have received a printed copy of this newsletter and would like to receive it electronically in the future, please email your contact details to reception@ballance.co.nz, writing 'consultants' newsletter" in the subject line. If you no longer wish to receive this newsletter, please advise us by emailing reception@ballance.co.nz

Kind regards

The Agro-Sciences Team
Ballance Agri-Nutrients

Why are fertiliser prices rising?

Fertiliser prices in New Zealand recently increased, no doubt to the dismay of farmers. There are several reasons for these increases and they have a common theme: supply and demand.

Demand is increasing because the world's population is increasing. Not only that, in general, people are getting wealthier, which means they have more money to spend on food. Thus, demand for fertilisers to grow quality crops and livestock has increased.

At the same time, there is less land available for agriculture. Today, It is estimated that there is an average 0.25 ha agricultural land per person, less than half that available in 1950. As a result, its use has intensified, further pushing up the demand for nutrient-dense fertilisers. This trend has been compounded by the growth in the biofuel market. These crops are nutrient-hungry: in 2007 biofuels alone are expected to drive a 4.7% increase in nitrogen fertiliser demand, and a 7.8% increase in phosphorus demand.

The fertiliser industry has struggled to keep up with the growing demand for its products. In the nitrogen sector, rising prices for natural gas have impacted heavily, especially in the European market, which is serviced primarily from plants in Russia and the Ukraine. Rising prices for natural gas have also meant that some older plants in the USA have become uneconomic to run, and as a result they have been decommissioned. This has led to the USA importing nitrogen fertilisers, further straining global resources.

The phosphate market is also production limited. Some sources of phosphate rock are based in countries subject to political instability, and in these cases reinvestment in the industry tends to be low, leading to a depletion of raw material. Elsewhere, better phosphate rock is slowly being exhausted, and lower quality rock has to be mined. This then needs to be supplemented with triple superphosphate, to bring it back up to specification, which puts further stress on limited resources.

Potash and sulphur supplies are also under pressure. The closure of a large mine in Russia has shortened the potash market, and industrial action and severe weather patterns have reduced the availability of sulphur.

In the long term, some of these constraints may ease. Investment in gas-rich former USSR states and the Arab Gulf may help with nitrogen fertiliser supplies. There are moves to debottleneck potash production amongst the major players, which may improve product availability. Sulphur supplies look as though they will be stable in the long term, barring any unforeseen actions. Phosphate, however, looks to be under extreme pressure for at least the next five years. The next large phosphate deposit to come on stream will be in Saudi Arabia, but even that is not expected to start producing until 2012.

Ballance has strong relationships with our raw material suppliers, and these have helped to ensure a steady supply of product over the years. Nonetheless, fertiliser prices are likely to continue to increase in the future. Fortunately, the co-operative model by which companies such as Ballance operate means that price increases are kept to a minimum, and we continue to focus on keeping costs under control, to ensure that our customers receive affordable, quality product.

Super and urea mixes

Earlier this year Ballance took the decision to stop the despatch of super and urea mixes from its service centres.

This action was taken because super and urea mixes are not compatible – they have a high chance of going wet and lumpy, causing problems for spreaders and increasing the risk of crop striping.

Urea is hygroscopic, so it attracts moisture from the air. This is particularly a problem when humidity is high.

Superten has a high level of water-soluble phosphate. This reacts with the water absorbed by urea, and the outcome is a wet sludge. This causes issues for groundspreaders, and is a danger for aerial top-dressing pilots.

If a urea-super mix is required for groundspread application, Ballance service centres will despatch these products layered in the truck, i.e. one layer of urea and one layer of superten. The products will not be mixed prior to loading into the truck.

If nitrogen and phosphorus are required in the one application, consider the use of the **pasturezeal** (South Island) and **pasturezeal G2** (North Island) range of products.

YaraMila Complex

Hydro complex, our very popular prilled fertiliser, has a new name.

In 2004, Norwegian fertiliser company Norsk Hydro restructured and as a result of that a specialist fertiliser arm – Yara – was created.

In recent times, Yara has been working on a single naming convention for its many products, which are sold all over the world.

Its solid NPK fertiliser products have been brought together under the Yara-Mila brand, and as a result of this, **hydro complex** is now called **YaraMila complex**.

Brassicas, sulphur and SMCOs

Although brassica crops are an ideal way of getting livestock through feed shortages, they can carry an animal health risk from the accumulation of SMCO (S-methyl cysteine sulphoxide) in the plant tissue.

The formation of SMCOs has traditionally been associated with sulphur (S), and this has led to DAP being a popular choice for use on these crops, because it does not contain any S.

However, research commissioned by Ballance and conducted by Crop & Food has shown that fertiliser S is not always the key driver of SMCO formation.

To test this, Gruner kale crops were grown at two differing sites. One, at Lincoln, had high soil sulphate levels (19 ppm) and high mineral nitrogen reserves. The other, at Hinds, had low soil sulphate levels (5 ppm) and lower total nitrogen reserves. Using a factorial experimental design, crops were grown with 0, 50 or 100 kg S/ha added, and 0, 100, 200 or 300 kg N/ha applied.

In the low sulphur soil (Hinds), adding fertiliser S resulted in an increase in SMCO accumulation in the kale crop. However, at Lincoln, where soil sulphate sulphur levels were high, adding more S as fertiliser had no effect on SMCO accumulation.

However, at Lincoln, adding fertiliser N caused an increase in SMCO levels in the kale. The more N applied, the higher the level of SMCO detected in the crop. In this case, using a S-containing fertiliser such as **superten** or serpentine super will not raise SMCO levels. Adding excess N to the system will promote SMCO formation.

When considering fertilisers for brassicas therefore, follow these steps:

- Take soil tests and include a test for nitrogen reserves
- If soil is low in S (Quick test <6) do not apply additional S in the fertiliser (e.g., use DAP)
- If soil is high in S (Quick test >10), it is safe to apply a S-containing fertiliser (e.g. use **superten** or serpentine super)
- If soil N reserves are high, avoid applying excessive fertiliser N
- If soil N reserves are low, only apply nitrogen fertiliser to meet crop needs.

Salt injury

When recommending fertiliser, the first consideration has to be the amounts of nutrients required to raise soil fertility to the desired level and support the intended crop. On top of this, economic and environmental concerns must be addressed in selection of the fertiliser product.

Where large amounts of fertiliser are being applied, or when fertiliser is to be drilled with seed, the salt index of the products should also be considered.

The salt index is a relative measure of the salt concentration that a fertiliser induces in the soil water solution. The higher the salt index, the more risk that the fertiliser will cause salt injury to developing seedlings.

The benchmark for the salt index is sodium nitrate, which is given a value of 100. This was selected as it is fully water soluble and was a commonly used fertiliser in 1943, when the concept of salt index was first developed.

Products with a low salt index include reverted super (0), and serpentine super (0). Slightly higher are superphosphate (3.5), triple super (6.7), MAP (6.7) and DAP (7.5).

Products with a high salt index include SOA (53.7), ammonium nitrate (49.3), MOP (31.9) and urea (26.7). SOP has a salt index of 14.1.

Some crops, e.g. swedes and turnips, are more sensitive to salt injury and should only be planted with serpentine super and reverted super products, that will not cause any salt injury.

The risk of salt injury is higher when soil is dry; therefore, it is advisable to sow into moist soils. Correct placement of the fertiliser will also help to limit the risk of salt injury.

If crops are affected by salt injury, the symptoms will likely include slow and patchy seed germination, sudden wilting, stunted growth and gradual death of the plants. In some cases, salt injury can be overcome by diluting out the concentrated nutrients with irrigation (or rainfall), but affected crops are unlikely to reach their yield potential.

Contaminants

If you've looked at a Ballance price list lately, you may have noticed a declaration regarding the cadmium and fluorine content of our phosphate fertilisers.

These are two very common contaminants of the rock that is used to manufacture phosphate fertilisers. Most rock used to make phosphate fertilisers is of sedimentary origin, and the fluorine and cadmium was present when this rock was formed, millions of years ago.

For many years now, the New Zealand fertiliser industry has had in place a strategy to reduce the levels of these contaminants in phosphate fertilisers. Currently, the industry has set standards of less than 270 g fluorine/kg P and less than 280 mg cadmium/kg P. All of Ballance's phosphate fertilisers comply with these standards.

The new Code of Practice for Nutrient Management has information on both cadmium and fluorine. It can be downloaded from the Fert Research website (www.fertresearch.org.nz)

Ballance Avoca Dicalcic

Ballance has added a second dicalcic fertiliser to its list of products. This is the outcome of a business arrangement with Avoca Lime, based near Whangarei.

Ballance Avoca Dicalcic (available from late October 2007) is made by blending equal amounts of lime with fully cured **superten**, wetting the mix and leaving it to mature for a period of four weeks. During this time the water-soluble monocalcium phosphate in **superten** reverts to citric acid-soluble dicalcium phosphate. The addition of water to the process means that there is virtually no water-soluble phosphate left at the end of the process.

The product has a neutral pH (7.0), 4.7% phosphorus, 5.3% sulphur and good liming value, each tonne of the product being equivalent to 350 kg of pure lime.

The high proportion of dicalcium phosphate in Ballance Avoca Dicalcic makes it ideal for use in situations where phosphate run-off is a risk. The product is screened to produce particle sizes of 10 mm or less, and is suitable for ground-spread and aerial top-dressing.

Ballance Avoca Dicalcic is available in Northland only. Customers in the East Coast and Manawatu districts can purchase a similar product, Ballance Hatuma Dicalcic.

Technical specialists

Ballance has four technical specialists who provide support to the company's sales representatives, and who are involved in ongoing research aimed at developing new and improved products and services.

Headed by Warwick Catto, the team has a wide range of professional interests, including precision agriculture (Aaron Stafford), nutrient use efficiency (Jeff Morton) and no-tillage systems (Murray Lane). Together they have practical experience as farmers, scientists, fertiliser representatives and technical extension specialists.

Warwick Catto

Aaron Stafford

Jeff Morton

Murray Lane

Seasonal review

In each of our consultants' newsletters, we thought that it might be useful to list some of the important seasonal events associated with nutrient management and animal mineral nutrition. The table opposite is a quick reference to the activities that are important over the next few months.

Activity	August	September	October	November	December
Check that the annual fertiliser programme is cost-effective	✓				
Check that the Mg supplementation programme on dairy farms is supplying sufficient Mg for each cow	✓				
Monitor the feed budget and consider the use of strategic N to fill feed gaps	✓	✓	✓		
Assess areas closed for supplements; consider using N fertiliser to increase the amount of silage harvested			✓	✓	
Pre-grazing, monitor pasture for metabolisable energy (ME) and digestibility	✓	✓	✓	✓	✓
Take pasture samples and analyse clover for nutrient content					✓