

2018
Spring

Hunter Local Land Services

Pasture news



Welcome to our Spring Pasture newsletter. This edition we are focusing on the role nutrients play in pasture growth, animal health and nutrition. With the ongoing drought impacting pasture supplies and quality across the region, it's important to recognise how important nutrients are in balancing your paddocks, and how deficiencies can negatively impact your crops and livestock.

Why are Phosphorus, Sulphur and Moly so critical to the pasture system?

Phosphorus (P) is one of the nutrients where we aim to have the fuel tank full. Phosphorus plays a vital role in new root and shoot development and is required early by the plant, hence the reason why phosphorus is always suggested at planting. Additionally phosphorus is also involved in the production of sugars and starches via photosynthesis and respiration. Although not overly mobile in the soil, phosphorus is readily mobile within the plant, moving quickly from older to younger tissue throughout the growing season.

Deficiency symptoms include:

- Poor legume growth and populations
- Slow emergence and growth of annuals
- Stunted and spindly plants and poor tillering
- Dark green foliage with purple veins and petioles appearing in older leaves first

Phosphorus fixation (where phosphorus can be locked up) is greatest in soils that have high clay content, are at extremes of acidity or alkalinity and are high in aluminium and/or iron. Soil tests can assist in indicating the level of fixation via the **Phosphorus Buffering Index** in conjunction with

the phosphorus extraction. There are two main soil analysis forms used in NSW as per below. The Colwell extraction is the preferred option.

- Olsen P – plant available P – 3hr extraction
- Colwell P – total predictive available P – 16hr extraction

Animals influenced by low P availability will exhibit ill thrift, weight loss, poor fertility and difficulty birthing.

Some examples of standard granular Phosphorus fertilisers include:

- Single Superphosphate: 0-9-0-11
- Mono-ammonium phosphate (MAP): 10-22-0-1.5
- Di-Ammonium phosphate (DAP): 18-20-0-1.5
- Pasture King: 0-16-0-5

Sulphur (S) is taken up via plants roots in smaller volumes than phosphorus. Sulphur is required for the production of three crucial amino acids that are present in plant proteins, for the formation of nodules on legume roots, is essential for fatty acid and chloroplast development and is involved in photosynthesis. Plants take up sulphur in the sulphate (readily available) form, with elemental sulphur being reliant upon Thiobacillus bacteria to convert to sulphate-S (oxidation process). Sulphur status is general at its highest when soil is cultivated and fallow and as the sulphate form is not as strongly held onto clay particles, leaching on light soils with high rainfall is common.

Deficiency Symptoms include:

- Poor growth
- Reduced tillering and legume nodule size and population
- Pale green-yellow foliage occurring in the younger leaves first
- Rigidity and brittleness, thin stems
- Can be first seen as decline in protein before yield
- Common in lighter textured soils
- Products such as SOA can increase soil acidity on lightly textured soils

There are two main Sulphur soil extraction methods:

- **MCP** – measures exchangeable and water-soluble sulphate sulphur
- **KCI** – measures Sulphate-S and some of the more readily mineralised organic sulphur

Some examples of standard granular Sulphur fertilisers include:

- Single Superphosphate: 0-9-0-11
- Sulphate of Ammonium (Gran-Am/Slam): 0-20-0-24
- Granulock SS / MAPStar: 10-18-0-12
- Sulphur Bentonite / Tiger 90 / Sustain: 0-0-0-90
- Pasture King SS Blends

Molybdenum (Mo) is highly mobile within the plant but is the least abundant trace element in soils, nor in a form unavailable to plants. The more infertile the soil, the less molybdenum and where soil is < 6 pH with the presence of iron and aluminium oxides, Moly availability is further reduced. Plants uptake Moly as the molybdate ion but this can be depressed by the increased presence of sulphate.

Moly is important to nitrogen metabolism and protein synthesis for the reduction of nitrate to nitrite (first step

in amino acids and protein synthesis) and the nitrogen fixation process in legumes. Moly is required at 10 times the concentration for nitrogen fixation than for protein synthesis. Deficiency is most common in legumes and where Moly >5mg/kg DM, copper deficiency may be induced in livestock.

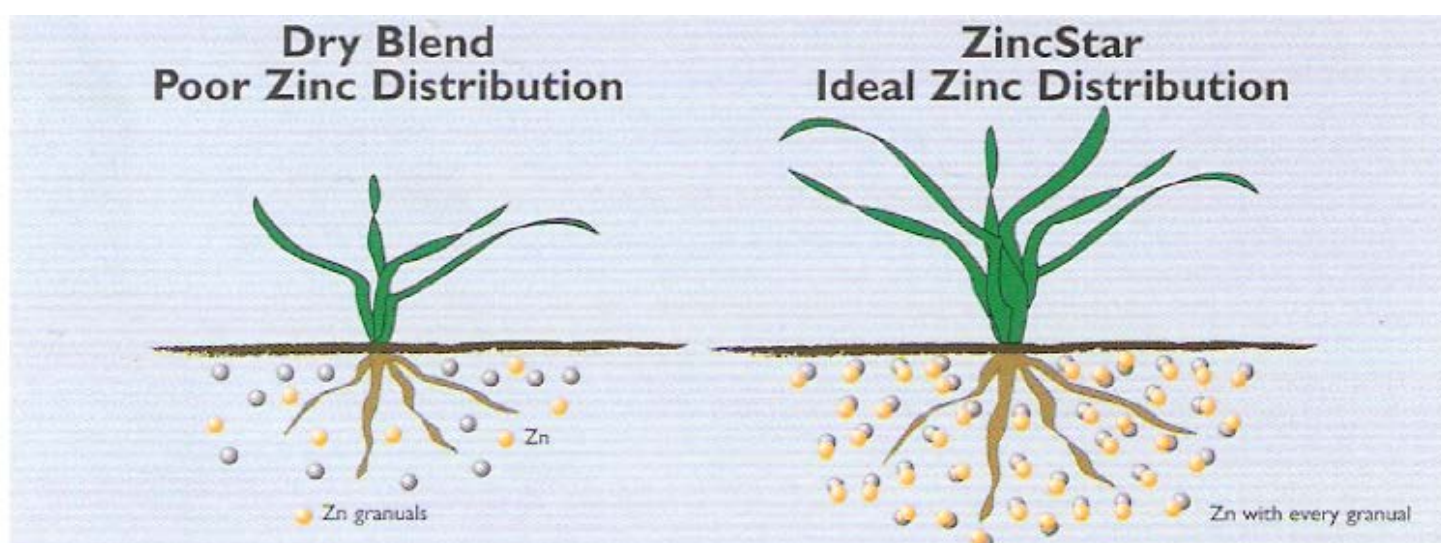
Moly can only be assessed by tissue analysis and is generally applied every three to five years at concentrations of 0.025% and 0.05% respectively as a spray application to phosphorus based fertilisers at the point of despatch. Granular forms of Moly are also available.

Assessing fertiliser options?

When assessing fertiliser options, one of the most important steps is to ascertain what your soil fertility status is. A soil test every three to five years for maintenance paddocks and more frequently (every 12-18mths) for cropping or high performance pasture paddocks is suggested. The cost of a soil test can vary as can the quality of the analysis and should be viewed as an insurance to target a balanced diet rather than guessing or relying on tradition. Fertiliser remains the highest input cost for any pasture enterprise and so allocating that spend to the correct nutrients is imperative. Always best to work with laboratories that have both ASPAC and NATA accreditation and stay with the same lab for consistency of reporting.

Once you have ascertained your soil fertility status, the next step is assessing the product of best fit and it should not just be about cost. Other aspects to take into consideration include the nutrient form (readily available or slow release) and whether it is a compound (all nutrients in one granule) or a blend (two or more products mix together). See below example of Zn distribution comparison.

In the blend situation, it is a mix of fertiliser types at different ratios and so the distribution of some nutrients may be inconsistent once spread. In comparison, a compound has all nutrients in every granule for a more even distribution.



Even distribution of zinc in the soil is essential for maximum performance of crops and pastures.

Source: Impact Fertilisers



Compounds can generally be more expensive than a blend but part of the consideration is also total tonnage required, spreading costs and bonus nutrients.

Some of the standard phosphorus and sulphur fertilisers available

The table below denotes the analysis of a number of standard commercially available phosphorus and sulphur products

N%	P%	Sulphate S%	Elemental S%	Total S%	
	9			11	^
	16	4.6		4.6	^
	15	4.37	4.5	8.87	#
	14	4.14	9	13.1	#
	13	3.91	13.5	17.41	#
	7	8.8	18	26.8	#
	8	6.3	38.7	45	#
10	18	4	8	12	•
	18	3	9	12	•

^ straight # blend *compound

A few working examples:

Example One:

Farmer Pat traditionally spreads SSP at 150kg/ha to his 286ha, applying 13kgP/ha and 16kgS/ha. He requires 43t but due to road restrictions he has to work with a split delivery of 31t and 12t. Using the table above, if Farmer Pat changed to 0-13-0-17 he could reduce his tonnage to 28.6t. Firstly, this provides Farmer Pat with a freight saving on 14.4t, his spreading costs are unchanged and although a blend, he is applying a combination of sulphate and elemental sulphur.

Example Two:

Following some new soil tests, Farmer Betty has discovered that her soil phosphorus levels have reduced as she has not maintained here annual topdress program for a few years and so needs to apply some capital P this year. Additionally, her agronomist has suggested she look at a product with a greater percentage of elemental sulphur to help manage the leaching potential of sulphate sulphur on the lighter soils.

The analysis that has been suggested is 0-22-0-16 for the 350ha and the property is on a B-Double rated road. Although Farmer Betty has been a traditional SSP supporter, she can appreciate that for this year she will need to look at another option.

What would be her best options from the list?

Checklist:

1. review product with higher P proportion than S options
2. review which products may contain a greater percentage of elemental S

Options:

- 0-15-0-9 would require an application rate of 146kg/ha – 51.1t required
- 10-18-0-12 would require an application rate of 122kg/ha – 42.7t required

Although not a huge reduction in cost for Farmer Betty this year between the two products, given that it will be an aerial application in late April, the 10-18-0-12 would allow her to also apply some clover seed and use the bonus Nitrogen to assist with germination, but also only require one truck to complete the delivery.

Seed Supply Update

Further to the August update, all millets are now sold out from suppliers. Check with your preferred rural store to enquire as to what stocks they may have available. Brassicas, legumes and irrigated sorghums stocks remain steady at the time of print.



With seasonal conditions as they are, pressures have now been extended to seed crops for next autumn. Reports indicate that the majority of many common grazing and dual purpose Oat varieties will have limited availability and what is available have been ordered by the rural merchants. Consequently, additional pressure has been placed on proprietary lines of both Oats and Barley with the majority either sold out or very limited. Many national grass (rye, fescue etc) seed crops are also under pressure and availability will rely heavily on international stocks. The expected impact of this will be reduced supply and potential per kg price increase. Whilst appreciating that current conditions do not necessarily incite planning for next autumn, consider a quick chat with your rural merchandise supplier re stocks to secure supply.

Upcoming events

Next Singleton Pasture Demonstration Site Open Day mid October

Growing Hunter Beef - regional beef forum at Singleton Showground, Thursday 8 November

Fertiliser Supply Update ex Newcastle Port

Plentiful stocks of SSP and comparative products remain strong with indications of consistent supply throughout the balance of the year. Ex-works price remain comparative to the first half of 2018 at time of print.

AP's remain strong with indications of a small increase in ex-works price over recent weeks.

Urea stocks remain steady and as with AP's, there has been some increase in price ex-works. Some pressure is being observed with Ammonium Nitrate and liquid based Nitrogen fertilisers as landholders chase dry matter production with the odd shower and storm front passing through.



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