

# Pasture News

## Summit active in South West P trials

Phosphorus (P) remains one of the critical nutrients limiting production in our grazing systems. Many South West soils are among the most acutely P deficient in the world, so continued production that takes advantage of our rainfall requires regular P replacement.

Phosphorus cycling in soils is particularly complex. We know it is a nutrient that does not move readily in soils, except very light sandy soils in high rainfall areas. Generally, less than 30 per cent of applied P is taken up by the plant in the year of application.

So, while we do know a lot about applied P, there's still a lot we don't know. Recognising this, Summit Fertilizers attended meetings with the Department of Water and Environmental Regulation and the Department of Primary Industries and Regional Development, as part of a broader technical reference group to investigate the importance of P in

South West grazing systems.

What has emerged from these meetings will be the establishment of P trials this autumn, from the Peel down to Oyster Bay catchments.

Key objectives will be to:

- Calibrate P responses in pastures for the South West in present-day (new pasture species and varieties) grazing systems; and,
- Validate national critical P values in South West WA.

The trials will run over three years and are part of the National Landcare Program: Smart Farming Partnership project. They should help better define the relationship between economic responses of pasture species to P, and assess the environmental risk associated with the use of this nutrient.

National critical P values are those currently used by a number of advisors to determine whether a farm, or area of the farm, needs P or not.

There has been debate about the accuracy of these critical P levels on some soils with certain P-retaining characteristics or Phosphorus Buffering Indices (PBI's).

The trials will help determine if P is required on soils of different PBI's, at given background P levels and if required, how much. The background level is the plant-available P that shows in soil tests (Colwell Phosphorus for WA). Summit has been involved in the setting up of some of these trials (trial selection). Growers can contact Ralph Papalia for more information. Mobile: 0427 766 535 [rpapalia@summitfertilz.com.au](mailto:rpapalia@summitfertilz.com.au)



*By Ralph Papalia  
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## The importance of monitoring trace elements

Trace elements (or micro nutrients) are only required by plants in very small quantities, but nonetheless, are absolutely vital for healthy plant growth and in turn healthy livestock, high yields and profitable returns.

In the past, trace elements (TE's) have been applied to cleared soils at robust rates. Anywhere up to 2kg/ha of copper or Zinc, or 0.2kg/ha of Molybdenum was the consensus at the time and it was thought there would be no need to reapply TE's for a couple of decades at least.

Modern farming practices have evolved however, and the general consensus now is that TE's should be applied more frequently than in the past. As production has moved from predominantly legume to ryegrass pastures (a mixture of both is always best) and as liming becomes more frequent, we are observing changes in the availability of some trace elements.

### Copper (Cu)

Amongst other growth attributes, copper is required for nitrogen fixation by clover nodules. It is also important for lignin production, which is responsible for stem strength and rigidity especially in ryegrasses and cereals. Organic soils are commonly copper-deficient. In the South West, soils with organic carbon levels above 4% are quite common. These soils often contain large deposits of copper that is unavailable to plants.

The first signs of Cu deficiency, especially for clover, may be a wilted look regardless of soil moisture status. Copper has variable mobility in the plant. It may move from the oldest leaves as nitrogen moves, but in nitrogen adequate situations where the plant will continue to draw nitrogen from the soil, copper will not move. The earliest symptoms appear on the youngest growth.

*(Article continued on page 2)*

# Focus on potassium nutrition

Potassium (K) is an essential macro nutrient required by plants in relatively large amounts (about 1.5 to 2.0% of plant weight). Much of the K taken up by roots accumulates in the stems and leaves, which is why large volumes of foliage removed through hay and silage can deplete soil K reserves quite quickly. Without regular replacement, K often becomes production limiting.

## Leaching

One of the myths about potassium (K) is that it leaches rapidly. In fact, potassium is a cation and binds quite strongly to soil particles. Leaching may be a problem in the sandy soils that receive high rainfall. However, in stronger soils in lower rainfall areas where the soil has a reasonable clay or gravel content, or in duplex sand over clay/gravel soils, leaching is generally not a major concern. In waterlogged clays, or soils where surface erosion is likely to be a problem, then delayed or split K applications may be beneficial.

## Lime and potash

Applying lime to soils that have low to marginal levels of K (below 140ppm) can have a detrimental effect on K availability to the plant. The application of lime applies large amounts of calcium. Calcium and K appear to be absorbed through the same part of the root, so the plant will absorb the nutrient that is in abundance.

The other possibility is that the calcium (also a cation) will replace the K on the soil colloid, releasing the K for leaching.

## General guide to potassium applications in South West and Great Southern pastures based on soil test levels

K soil test level (ppm or mg/kg)	Recommended K rate (kg of K/ha)	
	Medium rainfall	High rainfall
greater than 120	0	0
80 - 120	10-20	20-30
60 - 80	20-30	30-40
40 - 60	30-50	40-60
less than 40	40-60	50-70

## K is essential for

- Protein synthesis
- Breakdown of carbohydrates which provides energy for growth
- Translocation (movement) of metal ions such as iron (Fe)
- Controlling ionic balance
- Helping the plant resist disease
- Withstanding drought, cold and frost
- Regulating water lost to the atmosphere
- Efficiency of nitrogen uptake

## K deficiency

K is a mobile nutrient in the plant. In deficiency situations it moves from older leaves to younger ones to support new growth. Therefore, symptoms appear on older leaves first. Symptoms begin as a speckling along the leaf, spreading quickly to the tip and the margin. Complete death of the older leaves may even occur.

In ryegrass, deficiency is often seen as a 'spear tip' effect on middle to older leaves.

## How much is needed?

Summit inSITE soil testing is revealing that without adequate replacement, in many lighter soil types (and in some heavy soils too) that have been cut for hay or silage over a number of years - K levels have dropped below 100 ppm.

It's well recognised that K levels below 100 ppm are marginal for clover production and the experience of many growers indicates that on the heavier soil types (with good cation exchange capacities) levels below 150 ppm may be a 'trigger' point for applying potash.

The table above gives a good general guide to K requirements in pastures based on soil analysis.

It should be noted that Balansa and Persian clovers are vigorous varieties often used for hay making. Observations indicate these varieties are more sensitive to K deficiency than other pasture legumes. If soil tests indicate levels around the 120 to 150 ppm then the use of K on these varieties, would be a wise precautionary measure.

## The importance of monitoring trace elements (continued from front page)

### Zinc (Zn)

Zinc is important for the synthesis of plant growth substances (hormones), enzymes and is essential in some metabolic reactions. chlorophyll and carbohydrates.

Zinc is immobile within the plant, so symptoms first appear on the younger leaves. Deficiency in South West pastures typically occurs at a mild rather than a severe level. Zinc become less available under high pH conditions. Concentrations of 20 ppm are usually adequate in most cases in

the youngest leaves but as production systems attain higher yields, 30 ppm is probably a better target.

Zinc deficiency is easy to identify in cereals, but much harder for ryegrass and clover. General stunting in pasture plants is often confused with phosphorus deficiency. In cereals, pale green stripes down either side of the main vein of fully emerged leaves indicates a mild deficiency. If leaf tissue in the stripe turns pale brown (tram lines) or necrotic, deficiency is severe.

### Molybdenum (Mo)

Molybdenum deficiency is less likely in South West soils where lime is applied to raise soil pH to a desirable target of 5 to 5.5 (calcium chloride). Mo may benefit the nitrogen fixation process, as in deficient situations clover roots form nodules that can often be inactive. Adequate Mo availability is important in facilitating nitrogen fixation on a number of soils, particularly those that lock up phosphorus. Frequent small applications (every 3-4 years) are recommended.



# Selenium strategies for local farms



Article contributed by Dr Ian Bradshaw  
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Our South West soils are almost universally selenium (Se) deficient and this can result in clinical disease in grazing animals such as white muscle disease or sudden deaths. More commonly it contributes to performance limiting subclinical disease, such as ill-thrift, poor reproductive performance and poor immune function, contributing to diseases such as mastitis, retained membranes and calf scours. Selenium deficiency also has a significant negative effect on sperm quality in bulls.

While many beef herds in South West WA are chronically selenium deficient, correcting selenium levels often doesn't result in easily observed improvements in health or production. This is because most effects of

selenium deficiency are subclinical, can be impacted by other diseases or deficiencies and are, by nature, often subtle and difficult to measure.

Nonetheless, we can be confident that correcting selenium deficiency will result in healthier, more productive animals.

Selenium can be supplemented by injections, rumen bullets, mineral licks and pasture top-dressing. Pasture top-dressing is a safe, convenient and cost-effective way of supplementing selenium.

Unfortunately, the effectiveness of selenium top-dressing appears not to be a 'one size fits all' solution.

Many factors can impact selenium availability from soils. These include;

- Soil acidity – selenium availability is lower in acid soils
- Sulphur levels – sulphur competes with selenium for uptake sites in both plants and animals. Hence, historically high rates of superphosphate may impact on selenium levels
- Pasture growth rates – high pasture growth rates dilute selenium concentration in pasture and increases per hectare selenium requirements
- Rainfall and soil type – leaching and persistence of selenium in soil may be affected by both rainfall and soil type
- Selenium form – selenium chip

or prills are commonly available as either quick release (sodium selenate) or slow release (barium selenate) lasting approximately one year or three years respectively

The aim of top-dressing with selenium is to ensure dietary selenium of livestock exceeds 0.1mg/kg DM in pasture. Recommended top-dressing application rates are typically 10g/ha of elemental Se. The addition rate depends on the selenium product being used and your per hectare fertilizer rate. This should be calculated in consultation with your agronomist to ensure sufficient Se is being applied.

Regardless of the method, we recommend monitoring selenium levels in livestock to ensure your supplementation program is working effectively. Blood testing a small sample of high risk animals is inexpensive and a very reliable way of monitoring effectiveness of selenium top-dressing.

For cattle, early lactation cows in winter/spring, or rapidly growing weaner calves later in spring, have high demand for selenium and are ideal animals to check selenium status.

Collecting five to six blood samples will give a very good indication of selenium status at a lab cost of less than \$100 and can often be fitted in with other routine vet visits such as pregnancy testing.

If selenium levels in animals are insufficient despite top-dressing, application rates need to be revisited in consultation with your agronomist and veterinarian and adjusted and monitored as required to suit your farm and fertilizer requirements.

Top-dressing with selenium is the safest and most convenient way of supplementing selenium, but only if you get the application rate right for your farm. Other methods of selenium supplementation typically cost between \$5 and \$10/head (for cattle) per year, so topdressing needs to be within this range to be a cost competitive option.

*The Summit Bunbury Depot offers customers great flexibility with fertilizer blending and loading. The depot has facilities to do multiple product blends (up to 9 in a blend, including selenium and trace elements) and can supply fertilizer in 1000kg bulka bags.*



## inSITE plant analysis

Plant analysis is an excellent guide as to whether or not some nutrients are limiting growth. It is a much more reliable technique than soil testing for assessing trace element deficiencies such as copper, zinc, manganese, iron, boron and molybdenum and lesser macro nutrients of sulphur, calcium and magnesium.

### Key inSITE benefits are:

- Independent laboratory
- Rapid turnaround times
- Wide range of nutrients measured

For more information on Summit plant analysis, growers should talk with their Area Manager.

## Payment options

Many customers are now dealing direct with Summit. Some of the order management and payment options now available include:

- BPay before collection
- Funds transfer before collection
- Cheque before collection
- Fast Pay – direct debit four days after despatch\*
- Pay 25 – direct debit 25<sup>th</sup> of month following collection\*
- Deferred Payment Terms - payment to Summit by 25 January\*

*\*Credit approval by Summit required*

## Drier summers and soil nitrogen mineralisation

Nitrogen (N) mineralisation is the conversion of N contained in soil organic matter into plant available forms of N, by microbes.

Many growers ask the question: How much N will be available from mineralisation?

While mineralisation can slow down to almost a stop and speed up very quickly, it is a continuous process.

Factors that slow mineralisation are low moisture availability, cooler temperatures and low surface area contact with soil.

### What does it mean for you?

Many WA farms are experiencing drier summer and autumn periods. Low soil moisture content at this time can significantly impact N mineralisation and hence early N supply to your freshly sown crops.

Determining background soil N availability may be an important issue if soil conditions have been dry.

Summit Fertilizers can help you with these decisions. Ring Ralph Papalia or Peter Warren for more information.

## Better connect...SummitConnect

SummitConnect enables Summit customers to keep in touch with all their fertilizer transactions.

With SummitConnect, information is available 24/7 via the Summit Fertilizers website. Customers can download a range of activities and transactions including:

- Statements
- Invoices
- Orders on hand
- Despatches
- Weighbridge dockets for individual loads

With SummitConnect, up-to-date information is available anytime from anywhere. Customers can even give access to their accountant

or consultant, saving the need to transfer documents. Getting connected is easy. Customers simply email us at:

[summitconnect@summitfertz.com.au](mailto:summitconnect@summitfertz.com.au)

You will be provided with a unique login. Alternatively, you can contact the Kwinana office on 1800 198 224 or (08) 9439 8999.

Your Summit Area Manager is also available to assist with how best to make SummitConnect a bigger part of your everyday business.




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