DON'T FORGET THE BASICS! – P. K. & S.

REBECCA STEWART

A fertiliser bill is one of the biggest accounts a farm has each year; hence you should at least be estimating and not "guesstimating" on an account of this magnitude!

Like every year, early applications of fertiliser have great incentives behind them, not only in terms of costs but also in the timing of nutrient application. There have been numerous research trials conducted over the years proving that there are no pasture yield differences between summer or autumn applications of phosphorus fertiliser.

Logistically looking at the workload that presents itself later in the season, waiting times for fertiliser applications escalate; and it should be a great feeling knowing that your fertiliser has already been applied in a timely manner just waiting for those opening rains.

It's imperative that soil tests be regularly conducted to see what types of nutrient are required. From the information gained; nutrient and financial budgets can be managed to suit your business. Conducting soil tests will not only assist you financially in knowing what is required of the paddock; but also, the improvement of pasture growth by applying what is necessary for soil and plant functions.

You wouldn't go to your doctor and hope his "guesstimate" is right without a least doing some sort of test. Your soil health shouldn't be any different!

PHOSPHOROUS.

Most of the paddocks I have been soil testing have been coming back with a mixed bag of results in terms of P levels. A lot of the pastures that we have been improving by increasing extra P in the fertiliser over the last few years have had some absolutely staggering results; in pasture composition, growth rates and hence carrying capacity. There are also plenty of tests coming back showing that there is still some "tweaking" needed. That being said, a lot of these paddocks that we are testing with low P levels are predicted to be at a lower scale mainly due to the need for pasture improvement.

Phosphorus application generally occurs during summer and autumn to ensure there is enough available P in the soil for the peak growth period of the plants. If the P application is left too late after the break, it can result in reduced production as the P is not available at the beginning of this initial growing period.

Contents:

POTASSIUM.

With district hay sheds virtually empty and varying levels of drought over the rest of the country, there are a lot of farmers conserving fodder. Potassium (K) and spring boosters have been relied on heavily in good growing areas to bulk up paddocks and extend the season. The removal of potassium in hay crops is often dramatically underestimated by farmers. With one tonne removing 15-20kg/ha of potassium, one single cut of hay can remove up to 40-80kg/ha of K which is equivalent to 80-160kg/ha of muriate of potash (MOP) fertiliser. Soil potassium levels are constantly being mined and very rarely do we see adequate levels of potassium being replaced in relation to what was removed.

With potassium being required in large amounts for water movement and retention, you can definitely now see paddocks with adequate K and paddocks which are deficient. Potassium gives plants much better tolerance to cold, drought and disease; it is most definitely a nutrient that everyone needs to be more aware of. Potash for 2020 will be around $1.20/kg of K. If you want to extend the growing season as long as you can, check your soil test and where required, put potassium in the budget for 2020.

SULPHUR.

During the last couple of more traditional wet winters along with the extended springs; we have noticed a more dramatic reduction of sulphur from the soil surface. The soil tests that I am receiving are showing much lower than recommended levels of S over all soil types. There has been an increase in the use of elemental sulphur within blends to not only increase the S applications but to use two forms of nutrient (readily available and slow release). The use of elemental sulphur (slower release) on the lighter textured soils within the region has been of great benefit and I feel usage of this product will continue to increase.

I am concerned a lot of clients don't understand how important sulphur is. Over virtually all enterprises; the use of this nutrient is paramount to production systems. In wool, clover and canola production, sulphur is a key component. Whether you are using single super or a blend with sulphate and elemental sulphur, do not forget the importance of S this season.

The synergies of adding sulphur to either straight phosphorous, potash or nitrogen are well documented in enhancing the nutrient efficiency and efficacy of the other element. It's ironic that by adding one of the lowest cost nutrients (sulphur); farmers can dramatically improve the effectiveness of their costliest nutrients.

WELCOME TO VICKERY BROS

Vickery Bros. has welcomed graduate agronomists Elizabeth Kennedy and Jasleen Sandhu.

Growing up on a small piece of land in the Yarra Valley, Elizabeth has always had a passion for agriculture. She has recently completed a Bachelor of Agriculture from the University of Melbourne; including a semester at their Dookie Campus. Having relocated to Coleraine, she is now excited about the opportunity to expand her agronomic knowledge amongst a core group of agronomists in a training environment like no other.

As a new member of the agronomy team at Vickery Bros, Elizabeth looks forward to meeting clients and learning to service all their agronomic needs.

Jasleen has recently completed her Bachelor of Science double-majoring in Crop & Pasture and Animal Science at Murdoch University, WA. Originally from Kuala Lumpur Malaysia, she moved to Perth WA to commence further studies. After completing her secondary schooling, Jasleen started an animal science major with intentions to eventually venture into veterinary science. Midway through the degree, she discovered there was more exciting opportunities within agriculture and also took on a crop & pasture major. After graduating in July'19, Jasleen has relocated from Perth WA and is currently based in Coleraine. She enjoys running, camping and other outdoor activities in her spare time. Jasleen is eager to learn, better understand the challenges faced by farmers and is looking forward to meeting clients and learning to service all their agronomic needs.

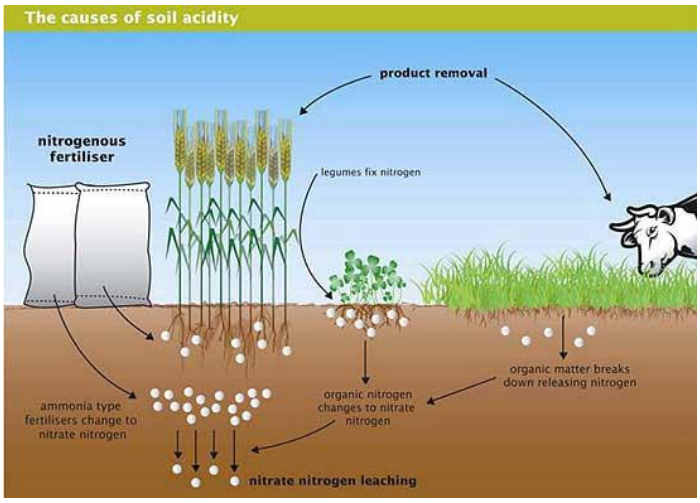
LIME RATES - WAS THE OLD RULE OF THUMB ENOUGH

ROGER GEE

Generally, lime has been applied at standard rate of 2.5t/ha (1 ton/ac) with only some variation where soil type required.

So, the question is, was this enough?

Soil acidification is a potentially serious land degradation issue and without treatment soil acidification is having a major impact on agricultural productivity and sustainable farming systems. As the soil acidifies some elements become toxic; the main one being aluminium. Soluble aluminium in the soil solution causes most of the problems associated with acidic soils. The principal effects on plant growth are reduced root mass and function, stunted club shaped roots and reduced ability to extract moisture from deep in the soil. Soluble aluminium immobilises phosphorus in the soil and the plant causing symptoms of phosphorus deficiency (small and dark-green or occasionally purple leaves). The symptoms become more pronounced as the aluminium level increases.

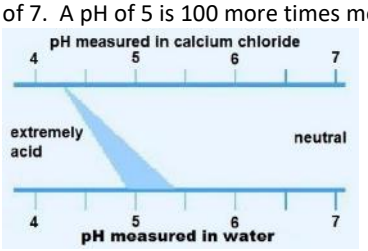


Soil acidity occurs naturally in higher rainfall areas and can vary according to the landscape geology, clay mineralogy, soil texture and buffering capacity. Soil acidification is a natural process, accelerated by some agricultural practices (example above).

When plant material, grain and animal products are withdrawn from the paddock alkalinity is also removed, therefore making the soil more acid. Full crop and hay removal are particularly acidifying because large amounts of product are removed.

More significantly, soil acidification is most often a result of nitrate leaching. Nitrates in the soil form as a result of; nitrogen fixed by legume-based plants; breakdown of organic matter; dung & urine, and from nitrogen-based fertilisers as shown above.

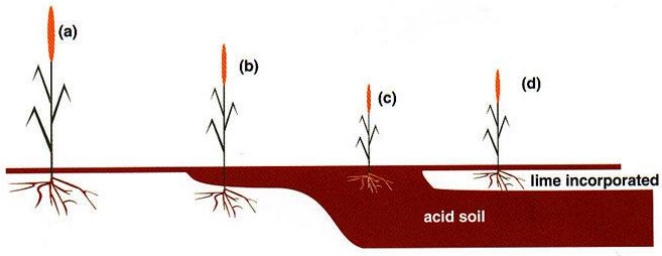
Soil pH is a measure of acidity or alkalinity and a pH of 7 is neutral. Above 7 is alkaline, and below 7 is acid. Because pH is measured on a logarithmic scale, a pH of 6 is 10 times more acidic than a pH of 7. A pH of 5 is 100 more times more acidic than pH 7.



Soil pH can be measured in either water (pH H20) or in Calcium Chloride (pH CaCl2), and the pH will vary depending on the method used.

As a general rule, pH measured in calcium chloride is 0.7 to 0.8 of a pH unit lower than pH measured in water, and the pH water number will vary slightly through the year.

Back to the question, was it enough? In short, NO! Current and ongoing research, along with a review of existing data, has revealed alarming results for those low rates of surface applied lime. One of the critical values when making a recommendation for lime applications has generally been if the pH is above 4.8 in CaCl2 (dependent upon soil type), in the 0-10cm soil test; then there is little immediate risk of acidity. However; if you were entering a pasture renovation phase, or summer crop; a higher pH might be targeted and lime applied. Work by Lisa Miller with Southern Farming Systems has revealed this approach is pushing the acidity below the test depth and in some soils barely that deep. In turn; this is creating an acidic bubble above the B soil horizon as shown. below.



a) No acidic problems
b) Acidification starts at the surface restricting surface root development
c) Acidity is leached to depth when the pH_{Ca} of the surface soils drops below 5.0 and all root growth is restricted.
d) Subsurface soil acidity is permanent as surface applied lime only corrects acidity in the surface soil.

Application rates in a lot of soils have; in the most been too low to adequately lift soil acidity to an acceptable level of at least 5.5 CaCl2. Alkalinity movement only occurs below 10 cm if pH in the surface 0-10 cm is kept above pH 5.5.

New standards will advise where soil pH is low, a deeper soil sample should be taken to correctly access appropriate rates of the high ENV lime being applied. As a general rule, the target pH for depths below 10 cm should be 4.8 CaCl2.

Summer provides the best opportunity to surface apply lime to pastures, when soils are dry, cracked and open. And whenever renovating pastures using soil cultivation to incorporate liming material, thus assisting the neutralizing process.

For further information or to discuss soil acidity on your property, please contact one of the agronomy team at Vickery Bros.

References:

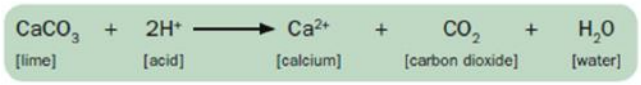
Liming & latest on soil pH management, SFS: Lisa Miller Jan2019
Soil Acidity – Fact Sheet: www.soilquality.org.au
Acid Soils – Agnote AG1182: Carole Hollier and Michael Reed. Rutherglen. April 2005.
Soil Acidity & Liming – Agnote AC.19: Upjohn, Fenton, Conyers 3rd edition 2005

SOIL ACIDITY, LIMING, ALUMINIUM & MANGANESE TOXICITY FAQ'S

PHIL WHITE

What is Lime?

An agricultural liming material is defined as a Calcium or Magnesium Carbonate containing compound capable of neutralizing soil acidity. The reaction of lime added to an acid soil is shown by the equation below.



The carbonate (CO_3^{2-}) is the active ingredient of the lime and it is the amount of carbonate added to the soil through liming that determines the reduction in H^+ ions thus increasing soil pH. The finer the lime the faster the reactivity occurs but the overall pH change is determined by the amount of carbonate added not the fineness of the product.

Why do we lime?

Liming is generally carried out to reduce acidity, overcome aluminium and manganese toxicity; increase the availability of molybdenum and phosphorus as well as enhancing nitrogen mineralization by making conditions more favourable for microbial activity. Lime has been shown to aid in the inoculation of legumes as the rhizobium bacteria responsible for nitrogen fixation are particularly sensitive to low pH, high aluminium conditions. Subterranean clover, our dominant pastoral legume is quite tolerant of acid soil conditions however the rhizobium bacteria that 'fixes' nitrogen for the plant isn't. This problem is visually identified by sub clover responses to nitrogen applications and urine patches. pH conditions closer to neutral also increase the activity of decomposing soil biology such as earthworms and increase nitrogen mineralisation, the process by which organic forms of nitrogen (in plant material of dung) are converted by bacteria to inorganic plant available forms.

What effect will liming have on my legume nodulation?

Biological nitrogen fixation through the symbiotic relationship between *Rhizobium spp* and sub clover in particular, has traditionally been relied on as the primary input of nitrogen in Western Victorian grazing enterprises. Acid soils harbour lower levels of rhizobia, which results in poor legume nodulation. Rhizobia are susceptible to the increased concentration of aluminium induced by low soil pH and the increase in H^+ ions. Whilst the reduction in molybdenum availability at low pH is also a contributing factor to retarded legume nodulation.

How will my pasture respond to a lime application?

Pasture responses to lime application depend on the initial soil pH, aluminium and manganese content as well as the pasture species present and nutrient status of the soil. Whilst liming increases the availability of macro-nutrients such as P it should be remembered that 100 % availability of not very much is still not very much! The lower the initial pH the greater the response with responses plateauing at pH 5.8.

Increased legume abundance and hence nitrogen fixation and subsequent mineralisation is one of the primary responses to lime applications. Acid sensitive plants such as Lucerne and phalaris will be more responsive at higher pH than more tolerant species such as cocksfoot and some cereals.

What about former blue gum plantation sites?

Former blue gum sites often have quite low initial soil pH and associated high aluminium content. This makes establishment of legumes difficult which is of particular concern as the nitrogen fixation by legumes will be of high importance to reduce the carbon to nitrogen ratio and enhance breakdown of the woody debris on former forestry sites. When deciding to undertake a blue gum to pasture rehabilitation project the first step will be to conduct a soil test to determine the initial soil pH and nutrient content. From this your Vickery Bros. agronomist will be able to quantify your lime requirement based on soil pH, aluminium content and soil texture. The soil pH and aluminium status will also have an influence on the type of pasture species sown. For instance, cocksfoot is more tolerant of aluminium than phalaris which is more tolerant than Lucerne. Again, conduct a soil test and consult your Vickery Bros. agronomist for further information.

Tell me more about Aluminium?

Aluminium (Al^{3+}) is a constituent of most soils whose influence on plant growth is largely dependent on soil pH status. In near neutral pH soils aluminium is usually adsorbed on clay minerals in the form of $Al(OH)^{2+}$ and has no influence on plant growth. However, as soil pH lowers (gets more acid ie more H^+ ions) aluminium becomes more soluble and is present in the form of Al^{3+} an acidic cation which is toxic to plants at high concentrations. High aluminium concentrations retard root growth which renders plants less able to extract water and nutrients. Al^{3+} also binds to phosphates to make insoluble aluminium phosphates which reduces plant available phosphorus.

Waterlogging in red gum country?

Unfortunately, the double hit in our acidic winter waterlogged redgum country is the increase in availability of manganese under waterlogged conditions as well as low pH and high aluminium. Once soils become anaerobic (without oxygen) the solubility of manganese increases and can be found in toxic quantities.

How do I know if my soil pH is to low?

The first step is having a look at the history of the paddock and the pasture species that are in it. A lack of clover or poor clover performance coupled with reduced nodulation of clovers is also an indicator. The dominance of acid tolerant weeds like Sorrel is also an indicator. The second step is conducting a soil test to confirm your observations and quantify the amount of lime required to bring the pH back to optimum levels. Remember the optimum pH for one farming system and soil type will be different from the next; consult your Vickery Bros. agronomist for specialist advice.

What about the ratio of calcium compared with other cations, isn't that why we apply lime as well?

No. As indicated earlier the active constituent of lime is the carbonate content which mops up H^+ ions hence neutralising soil pH and making conditions more favourable for plant growth and microbial activity. Emphasis should be placed on providing sufficient amounts of cations ie K^+ rather than worrying about the ratio of cations that exist in the soil.

What time of the year should we apply lime?

Ideally if we are trying to establish an acid sensitive crop or pasture we should try to apply lime the season before to allow time for the reaction of lime and subsequent pH change to occur. We should avoid applying lime and superphosphate close together as this will result in reversion of the phosphate in super to more insoluble forms. Vickery Bros. are currently running a lime deal where if applying in December and January, payment is deferred until April. This is a great way to ensure your lime gets spread on time before the busy autumn rush!

COLERAINE DEPOT UPDATE

GEOFF VICKERY

During the winter months this year the Vickery Bros. Maintenance team undertook the project of upgrading the Coleraine blending plant. The old blenders were installed 14 years ago and have served the company extremely well. However, fertiliser blending and nutrient technology has gone ahead in leaps and bounds over the past 3 years, and as most of you know; if you don't keep addressing and investing in new technology; "the merry go round that is continually swinging faster; will inevitably throw you off."

Our dedicated team led by Paul Hippert our mechanical engineer/ depot manager, started designing and building the plant virtually the day after we commissioned our Hamilton blending facility.

The Layco declining weight blend system is a multi-feed computer operated system on individual weigh cells; encompassing stainless steel rotary valves as well as spray nozzles that meter the product out of 8 individual hoppers and 4 liquid pumps onto a main conveyor belt that continues onto a blend box; and then over a vibrating screen.

Paul spent a week in the U.S.A with the Layco engineers refining the design of this system and they have now incorporated many of our features into their plants they sell all over the world. It is also a 'feather in Pauls cap" that Layco had the confidence to allow us to build the plant whilst only supplying their "proprietary hardware & software" to make it all come together. This allowed us to increase the size and capacity of both the Hamilton and Coleraine blending plants and we now have 2 facilities that are world class, and the best in the country.

It takes a lot to get me excited; but I am extremely proud of how our staff managed these projects to ensure the company stays a major player in an industry that is constantly changing.

The Coleraine and Hamilton Blending plants are very innovative systems that will ensure efficient and accurate multi product blends that can incorporate polymer coated trace element liquids on every granule plus fungicides and biologicals to clients for years to come.

Merry Xmas.

Geoff Vickery- Managing Director.

COPPER DEFICIENCY IN LAMBS

LEIGHTON REES

Copper deficiency in livestock has again been a problem for many lamb producers. Many farms that I have visited in the last two years have had issues with lambs being sold over the hooks and reports coming back that the carcasses have been damaged. These problems have been exacerbated in recent years due to increased rainfall over the winter period making copper unavailable to the animal. When the soil becomes saturated the availability of molybdenum increases. As moly becomes more available copper does the opposite. These two trace elements tend to have an antagonistic effect on each other so the relationship between the two needs to be right. When looking at levels of availability aim for a 1-10 ratio meaning; that if your moly levels are 1mg/kg, then your copper level on your tissue test should be around 10mg/kg.

Copper availability

The availability of copper during these cooler periods is extremely important, especially in a lamb production system as this is when most lambs are developing in utero. The demand for copper during this period almost triples. If copper isn't available to the developing lamb during this period then issues such as lambs breaking bones and unseen production losses may occur.

Consequences

Many processors are now penalising producers for damage to carcasses eg; broken bones that have re-healed, as copper has become more available later on in the season. The reason for this is that the particular cut that has been damaged; cannot be sold. This puts more pressure on the price of our finished product, and basically means less profit for the producer.

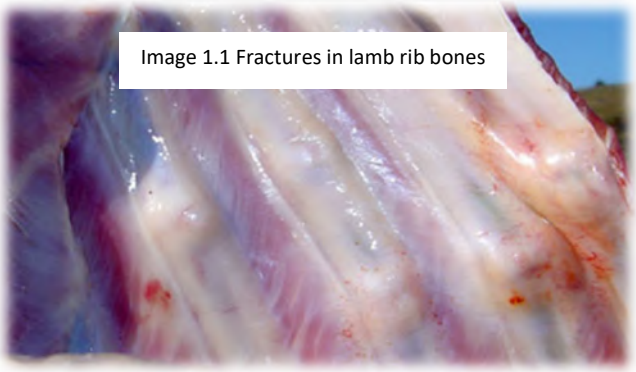


Image 1.1 Fractures in lamb rib bones

Symptoms in animals

Copper deficiency can often be overlooked due to the fact that by the time you see symptoms of a deficiency in the plant or pasture; you will probably be already seeing animal health issues in your lambs. The reason for this is that animals have a much higher requirement for copper than your pasture does. The symptoms of copper deficiency can often go unnoticed for some time. Swayback or lambs breaking bones may be the first thing you notice when you come across a copper deficient animal. This quite often occurs at marking time because this is the first time the lamb has been put under pressure.

Copper deficiency can be easily mistaken for low calcium levels as calcium deficient animals show similar signs to that of animals lacking copper. Copper levels need to be between 10-12mg/kg for optimal animal growth.

Image 1.2 Lamb with a severe copper deficiency

Symptoms in pasture

Signs of copper deficiency in clover are the cupping up of the leaf and die back in young tissue. White empty seed heads in grasses is also another sign of copper deficiency. The requirements for copper in the animal are far greater than that required by the plant to grow. Optimal levels of copper are between 6-12 mg/kg for plant growth.

Susceptible soil types

There are certain soil types which are more likely to become deficient in copper than others. These are typically lighter textured soil types. Soil types such as peat soils which are high in organic matter tend to tie up copper also, making it unavailable to the plant. However, this is not to say that heavier soil types won't be deficient in copper as well.

Managing copper levels

As part of a management program firstly look at tissue testing areas of your property with lighter textured soils or areas you suspect could be high in organic matter. As copper is extremely immobile in the soil, you will need to conduct a tissue analysis rather than a soil test. Soil tests should only be used as a guide to trace element availability. Tissue tests should be taken during the winter when copper availability is at its lowest. This is when most of the problems are occurring; and this is when you will get your most accurate reading. Another option is blood testing. This should be conducted at a similar time of year. As conditions warm up, copper becomes more available to the plant and test results will only give you an indication as to available levels. Remember never to apply molybdenum on its own without first checking available levels of copper and be wary when applying lime on areas of your property that could be low in available copper; as this can also make copper temporarily unavailable to the plant therefore increasing problems. The effect that liming has on copper availability is that when the pH is increased the availability of molybdenum, unlike most other trace elements becomes higher resulting in less available copper. The excess moly affects the ability of the rumen to fully utilise copper and therefore it is excreted by the animal.

What can you do?

Correcting copper deficiencies can be achieved through supplementation of copper directly to the animal or by increasing soil levels of available Cu. Foliar applications can also be used and this will be immediately available to the animal. Increasing copper levels won't only help with animal health issues but it will also protect pasture from fungal attack as well as increase pollination.

With the blending facilities at Vickery Bros. Copper can easily be coated on every granule with your annual fertiliser.

With the polymer copper glaze product that we use; there is Cu on every granule and rates can be easily adjusted to what is required depending on your soil and plant requirements.

Maintenance rates of 200-300grams annually are used and in cases where there is a known deficiency apply approximately 1-2kg/ha of copper depending on tissue test results.

Applications of 1-2kg/ha of copper will be sufficient for around 5-10 years depending on the base level of nutrient that you started off with.

TISSUE AND GRAIN TESTING

ANOTHER TOOL TO HELP BUDGET OUR NEXT AUTUMN FERTILISER APPLICATION

FRANZI RIEGGER

While soil testing has been well underway this spring, we also have other tools available to help the decision making for keeping your soil fertility at its optimum to ensure future farm performance.

It is as easy as collecting 400 grams of grain straight off the header or the same weight of hay/silage. Through the Nutrient Advantage laboratory at Werribee, we will be able to find out exactly how much nitrogen, phosphorus, potassium, sulphur, zinc and copper is in the grain, hay or silage.

With this information we can work out how much nutrient has come off your paddocks with the last crop. We can then supply you with the right amount of nutrients, to balance out what you have removed.

While there are a few nutrient removal tables available that are a good guide, values can still vary widely with different crop types, soils and the variability of the growing seasons. Therefore, testing your own produce is a great way to get away from averages and guesswork and to analyse your very own nutrient removal.

Here is an example of three tissue tests taken last year of three different hay crops, all on the same farm. In the white background are test results of nutrient concentrations within the tissue:

							Nutrient removed in g/ha		
Paddock Name	**Total Hay removed in t/ha Dry Matter Content: 90%**	**Total DM removed in t/ha**	**Nitrogen**	**Phosphorus**	**Potassium**	**Sulfur**	**Copper**	**Zinc**	**Moly**
			%	%	%	%	mg/kg	mg/kg	mg/kg
Paddock 1	**4.3**	3.87	1.2	0.22	1.7	0.18	2.4	13	0.45
total Nutrient removed in kg/ha:			46	9	66	7	9	50	2
Paddock 2	**4.7**	4.23	1.7	0.2	1.3	0.2	2.2	13.0	0.4
total Nutrient removed in kg/ha:			72	8	55	8	9	55	2
Paddock 3	**2.5**	2.25	1.0	0.1	1.0	0.1	2.2	15.0	0.5
total Nutrient removed in kg/ha:			22	3	22	3	5	34	1

The hay out of paddock number one has 1.2% of nitrogen in the plant tissue, meaning that 1t of dry matter carries 12kg of nitrogen. The farmer has baled 7 bales per hectare at 615kg each, which means that he has cut 4.3t of hay per hectare. The hay contains 10% moisture, which leaves us with 3.87t of dry matter removed per hectare. 12kgN/t multiplied by 3.87t equals 46kgN. This means we have taken 46kg/ha of nitrogen out of the soil. Which is equivalent to 100kg of Urea. The 0.22% of phosphorus converts to 9kg/ha of phosphorus, equivalent to 100kg/ha of Single Super. The potassium removed in hay is the biggest one to consider, with 1.7% of potassium in the tissue, the farmer has taken 66kg/ha of potassium off this paddock, translating to 132kg/ha of muriate of potash. Not to forget the 7kg/ha of Sulphur and the trace elements. Conserving fodder is an inevitable part of our grazing systems in the area. It will however only be sustainable if the nutrient that is being removed is getting replaced, too.

Where soil test data is available for the same areas, the decision making for this year's autumn application can be made even more accurate;

- Where nutrient levels present in the soil are higher than optimum, some mining can be done and not all or even no nutrient needs to be replaced.
- On areas where soil is already deficient in certain nutrients, it will be necessary to apply what has been removed plus a capital application of the pasture yield limiting nutrients.
- Paddocks with optimal nutrient levels will only require a nutrient replacement application, as determined in the tissue or grain sample.

It is also important to consider the total net worth of the nutrients removed and it is not to be underestimated, especially when thinking about selling your fodder. The cost to replace all nutrient taken out with the hay crop in paddock number one is $210/ha. Divided by the 7 bales a hectare, which gives a nutrient replacement cost of $30 per bale.

EARLY SOWING ANNUAL RYE GRASS

HARRY ARMSTRONG

Special purpose annual rye grass pastures can produce enormous quantities of high-quality feed from autumn to late spring.

They will always outperform cereals when grown in wet situations, particularly if nitrogen is applied in late autumn and early winter.

Livestock performance (weight gain) on annual rye pastures is significantly better than a lot of perennials because of its superior growth rate and zero endophyte status.

Annual rye grasses (especially the large seed tetraploids) have very good seedling vigour and are able to survive long dry spells when sown early in autumn. They can be sown dry if a rain event is expected or if there is some soil moisture present from a summer rainfall event. Direct drilling is preferable to a cultivated seedbed as it allows winter grazing to take place without pugging.

Early sowing is the cornerstone to success with annual rye. Opportunities exist for sowing from the middle of February in some years through to the end of March. April sowings can still be successful in dry autumns; but May/June sowing severely reduces winter production. Every week that sowing is delayed will result in a loss of 1000kg/DM/ha in total yield. So, sow as early as possible. High sowing rates are essential if decent yields over winter are expected. Current research done by seed companies and DEDJTR indicate that sowing rates for short term rye grasses should be around 35-40kg/ha in high rainfall zones. Lower rainfall areas may be able to go as low as 20-30kg/ha. Adjustments to sowing rate should be made for the difference in seed size between diploid and tetraploid types. Diploids have smaller seed size compared to tetraploids, so increase sowing rates for the tetraploids by 20% and reduce it for diploids by the same amount. Ask your seed retailer which type you are buying. If they don't know the difference, buy it from someone who does.

Lower seeding rates can be considered if clover (Balansa, Persian) is added to the blend. But maximum winter feed production is achieved with higher sowing rates of around 35kg/ha of annual rye. Maximum winter production is not rainfall dependant, as long as there is sufficient soil moisture. Winter growth is more dependent upon the amount of light the leaves can intersect. Hence the reason higher seeding rates produce more DM in winter. Cheaper varieties such as Tetilla are best suited to situations where winter feed is the only requirement and spraying the paddock out and sowing a summer crop is planned. The more expensive and densely tillered types such as Zoom and Winter Star 2 are more suitable if feed is required later into the spring, and when post silage/hay regrowth is a priority.

Ideally seed should be sown down the tube with up to 100kg/ha of DAP or MAP. If the potassium (K) status is suspected to be sub optimal, a blend of SOP/DAP can be used. However, it is preferable that soil fertility issues have already been addressed.

Insect pests must be controlled. The usual suspects are Red Legged Earth Mite (RLEM), slugs and crickets. Slugs and crickets are still very active in early autumn and have resulted in complete failures in heavier soil types so controlling them prior to sowing should be factored in as part of the process.

To achieve optimal growth rates urea should be applied at 100kg/ha 3 weeks after germination and then follow up with lower rates every 5-6 weeks thereafter where possible. Use Agrotain coated urea if conditions are on the dry side. The usual precautions should be taken in relation to possible nitrate poisoning as annual rye grass can accumulate high levels of nitrates.

Nitrogen applications are unlikely to produce economic returns in early autumn unless at least 50mm of rainfall has occurred.

Depots

Coleraine	(03) 5575 2777	Mt Gambier	0408 646 220
Heywood	(03) 5527 1777	Edenhope	0429 198 534
Casterton	(03) 5575 2777	Frances	0418 330 267

Hamilton 0417 752 777

BORON – NOT SO BORING AFTER ALL…

Low Boron levels in tissue tests we have taken this spring have been so alarmingly abundant right across our area that it's time, I give all our clients an explanation of what this element does.

As you can see below (Figure 1 from Nutrient Advantage); this is not uncommon, and that year on year the majority of tests across ryegrass (80%), lucerne (27%) and clover (65%) return lower than optimum values. Many farmers with these tissue test results will be wondering if they should be concerned about how this impacts their bottom line; and should they act?

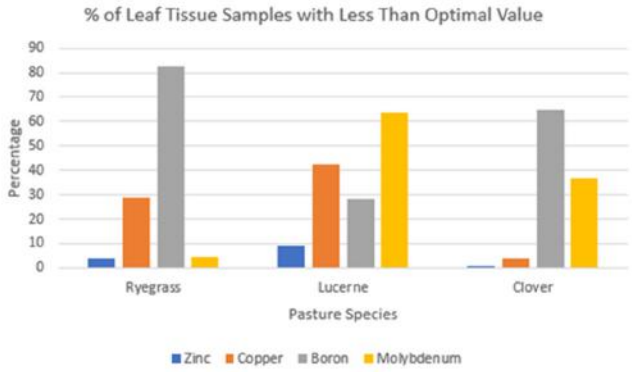


Figure 1: Below optimum levels of micronutrients in tissue test results. Source: Based on Nutrient Advantage® laboratory results from 2010 to April 2019, from 305 ryegrass samples, 358 lucerne samples and 562 clover samples. Nutrient Advantage

Boron is considered a micronutrient; which means that unlike phosphorous and nitrogen, it is only needed in small amounts. However, just because you only need a small amount does not make it any less important. In fact, if there is a deficiency, plant production can be severely impacted.

While not important for animals, it is essential for plant growth and function. It is used by the plant in many ways; but especially for:

- cell growth; which helps to minimise disease and pest pressure.
- seed set; allows you a better chance to obtain maximum yields.
- the nodulation process in legumes; allowing for healthy, functional and nitrogen-fixing clovers, lucerne, etc.

While soil tests can show an indication of a lower than optimum level, they are not accurate in testing boron; and therefore, a tissue test should be done to determine if there is a possible deficiency or cause for concern.

Deficiency symptoms appear in the newer plant leaves, as boron does not move within the plant and is more noticeable in legumes.

Deficiency symptoms in sub-clover leaves https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/158864/boron-deficiency-pastures-field-crops.pdf

Abnormal growth at both shoot and root tips can be an early indication. New leaves can have a variety of symptoms which include; drying, wilting, distorting, thickening and death spots.

It is important to be aware that toxicity can occur very easily and therefore you should ask your agronomist for advice when thinking of applying boron. It's imperative to get a tissue test done to confirm any deficiency beforehand. Boron can be easily added to your autumn fertiliser blend for ease of application.

Making sure soil boron levels are adequate is beneficial in many ways; especially for clover seed production.

Again, and again Australian research has uncovered that when there is adequate boron in the soil, clover seed yields increase. With the majority of pastures having a clover component in them, this is of great importance as it improves persistence. Responses therefore are seen through the improved persistence rather than through increases in dry matter production. It is also of interest to note that applying boron with lime could bolster clover seed production even more, but care must be taken to make sure the pH does not increase to much that boron availability starts to decline and bring you back to square one.

If you need more information on boron; speak to a Vickery Bros Agronomist to discuss this element that should be more often talked about.

References

Take the Test – For Legumes Sake, Nutrient Advantage, viewed 3/12/19, https://www.nutrientadvantage.com.au/latest-publications/agronomic-insights/pasture/take-the-test---for-legumes-sake

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GROUNDSPREADING AGRONOMIC CONSULTANCY TRANSPORT & LOGISTICS STORAGE & DISTRIBUTION

GROWING MORE FEED WHEN IT COUNTS

JOSH BROWN

There have been a lot of trials completed by various entities on the benefits that can be gained by lifting annual/Italian ryegrass sowing rates, which lifts/improves winter productions and paddock profitability. These trials have consistently concluded that lifting sowing rates above 20kg/ha will increase winter yield but not necessarily spring yield. This makes perfect sense with our limiting factors in winter always being sunlight and, in the spring, it is moisture. The more seedlings we establish the quicker we can achieve ground cover and the more efficient we capture the sunlight and turn it into feed. In the spring fully tillered plants can easily achieve ground cover and moisture is the major constraint governing yield.

Trials have consistently shown that for every 5kg/ha of annual ryegrass the sowing rate is lifted above 15kg/ha, winter feed is lifted around 250kg/DM/ha. With the cost of the drill covering the paddock still the same, that extra seed would only raise input costs by $22/ha. The cost of the extra feed grown is then only $88/ton, which when available in the middle of winter makes it a very sound investment. Proper soil nutrition is paramount in maximizing yield potential with any deficiencies soon decreasing the percentage of gains. Other methods to lift production further are early sowing which Harry covers in his article early sowing annual rye grass and use of urea to push the huge genetic potential of new varieties of annual ryegrass and further enhance winter yields and profitability.

This year with a late break, high feed prices and the above already completed trials in mind, we decided to run our own winter forage trial comparing winter yields of different species, mixes and sowing rates to see if we could emulate the same concepts. Although all the data from the trial is not in yet we did see in Marleigh Oats that lifting sowing rate from 100kg/ha to 150kg/ha increased winter feed (August 1st cut) available dry matter by 18%. The gain did however start to taper off when we upped sowing rates to 200kg/ha with a 26% DM/kg/ha gain over the 100kg/ha rate plots.

Purely based on extra winter feed grown alone and even with the high price of seed oats this year all oat sowing rate increases were economical up to our highest rate of 200kg. We will continue to conduct trials to identify how we can manipulate mixes and sowing rates in order to grow more winter feed when needed, and so we can be more confident with the economics when making input decisions in the autumn.

SEASONAL REMINDER

DON'T BE TARDY ON CRICKET CONTROL

GEOFF VICKERY

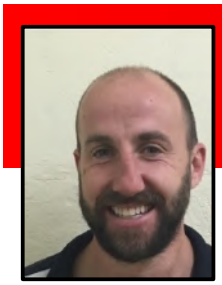
Do you have enough surplus grass to feed your crickets this year? They are still going to need their share; and you can't just shove them all in a sacrifice paddock!!! With crickets consuming up to 2000kg DM/ha in a year I would think that no one can afford to keep crickets this season! Controlling these little blighters needs to start NOW!

Although you may think that there are no crickets about; go put a moist hessian bag in an area which is susceptible and you will soon see whether they are active. Cricket populations need to be monitored and decisions about controlling them need to be thought about now.

"If you are not monitoring crickets NOW, you may as well start buying another 2tonnes of hay/per hectare for your suspect areas. Hay definitely won't get any cheaper in February!!!"

Controlling populations can be done either using an insecticide or baited grain. The use of a non-residual synthetic pyrethrin insecticide should be used in areas which have a green pick available for the crickets to eat. If there is no green pick available, grain baited with Maldison 500 (or equivalent) should be spread out on farm. You must ensure that you have the correct control for your situation to ensure the best response. Grain can be treated at the Vickery Bros. depot and spread on the affected pastures. Rates of grain are 15kg/ha and to have your paddock treated; it will cost $24/ha supplied, treated and spread.

Speak to your local Vickery Bros. agronomist about controlling crickets in the season coming and be ready to move to protect your pasture before it's too late!



ARGENTINA STUDY TOUR

JOSH BROWN

Earlier this spring I was offered the opportunity to attend a study tour to Argentina and Uruguay with Seed Force. It was an amazing opportunity to travel into the heartland of South American agriculture and visit some of Seed Force's breeding partners and research farms.

After many hours in planes and a quick look around the capital Buenos Aries, we head north west to Marcos Juarez to visit seed supply partner Forage Genetics research farm. Argentina is the second biggest grower of lucerne, with 13% of the worlds planted area, and Forage Genetic are one of the country's leading breeders and exporters of lucerne.

Forage Genetics ran us through one of their breeding and evaluation stations showing us the importance of pest resistance with the high numbers of aphids present across Argentina. Their Roundup ready lucerne lines were very impressive and showed great potential with ease of establishment and management of hard to kill weeds. Of all the breeding lines we saw it was their genetically engineered HarvXtra lucerne lines which were most exciting. Not only does HarvXtra contain the Roundup ready trait but it also contains less acid detergent lignin (ADL) and higher neutral detergent fiber digestibility, improving forage quality by 14-18% compared to other varieties cut at the same stage. It was encouraging to see just how many different avenues and markets they were looking at with their lucerne breeding. One example includes breeding lucerne with tannins to reduce bloat.

Next stop was at the government run Argentinian research farm INTA, where their head farm manager ran us through the production system trials. Trials included pasture mixes, species and the best grazing management systems to maximize beef production. Their new pasture mixes of fescue, brome and lucerne being rotationally grazed were producing 8 -14 ton DM/ha/year compared to native grass lands only growing 1.5 – 4ton DM/ha/year.

Gentos were our next hosts and their hospitality, passion for breeding and work culture was second to none! They had a huge portfolio with more than 60 cultivars and 15 programs pushing new products and species to market. Their perennial brome grass program and lotus lines were exciting and could have huge potential for our area in the future.

The perennial brome grass program was only in its infancy and is still many years away from market, but they had already been able to get new lines to persist in tough environments down to 400mm annual rainfall. Perennial brome could have a strong fit in our pasture systems alongside or as an alternative to phalaris and cocksfoot.

Lotus is a high protein, palatable, non-bloating perennial legume that is very tolerant of water logging and acidity. There have been lotus seed trialled and used in our area in the past however have struggled to find a niche in our pasture systems. Gentos' breeding program contains a 3rd family of lotus as well as the 2 more common families and they have new cultivars coming through with improved persistence under grazing, palatability and production. We walked through a selection trial that had old variety plots that had completely disappeared under hard grazing selection, while the new lines plots were thriving.

It was an incredible experience to see the challenges agriculture is facing overseas and what great leaps are been taken outside of Australia to lift productivity in different environments. It was incredibly exciting and motivating to see some of the advancements and technologies that are on cusp of coming to Australia, some sooner than others.

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SEASONAL REMINDERS

- Take advantage of our lime deal, get your soil pH right! (& assist your cash flow)
- Soil test to check nutrient levels
- Make sure your dumpsite has been graded and check for powerlines
- Make the most of early bird incentives
- Get your farm nutrient plan organised
- Follow us on Facebook, Instagram and Twitter!!
- Control those crickets!

If undeliverable return to:
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