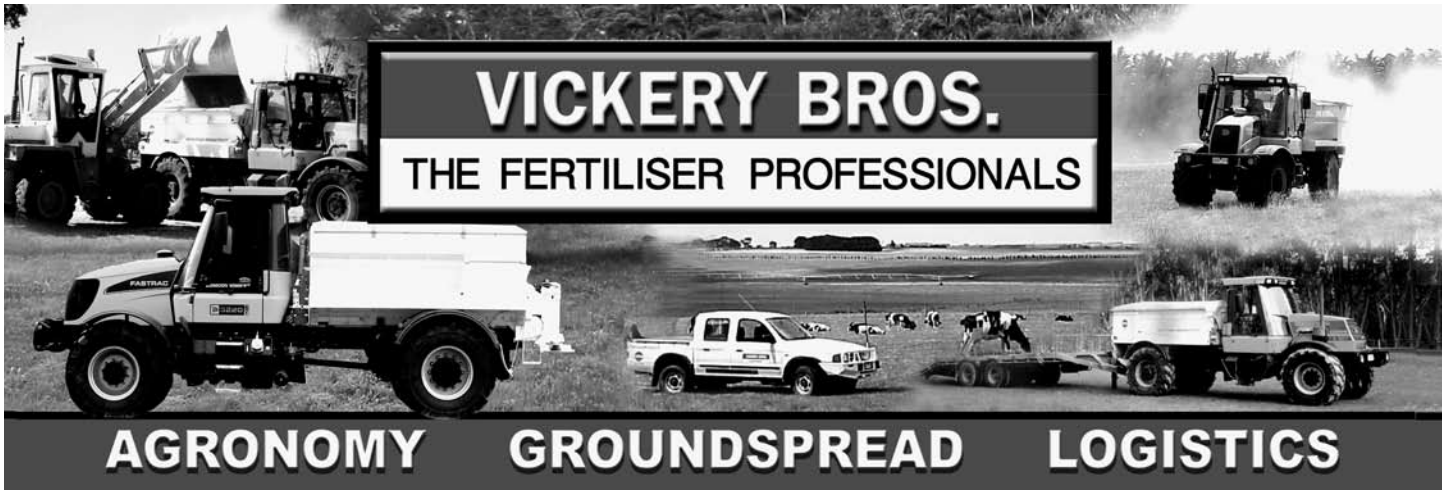

September 2005

SPRING NEWSLETTER

SPRING HAY AND SILAGE PRODUCTION

By Jane Wilkinson

After tough autumn and winter seasonal conditions, it's encouraging to see some good spring growth. However, with low subsoil moisture we need to capitalise on this pasture growth while growing conditions are suitable. Your decision needs to be made NOW to maximise economic spring pasture, hay and silage production. Applying a boosta to increase growth and nutritional value is insurance against a tough finish, as the last few experienced.

NITROGEN RESPONSE TO DATE.

Those of our clients who made the decision over the winter to apply urea or a blend have really benefited from the extra winter feed. Producers found the addition of urea to increase pasture growth provided cheaper feed per mega joule of energy than buying in grain and reduced labor costs associated with grain feeding.

Pastures this year have proven to be very responsive to the application of extra nitrogen in blends as the soil nitrogen stored was utilized during the false break early this year. Those paddocks with a poor fertiliser history have needed extra phosphorous and potassium blended with the nitrogen to ensure adequate levels of nutrients are available for plants.

Contents:

NUTRIENTS REQUIRED.

Our local knowledge of different soils and pasture composition allow us to tailor a blend to your individual paddock's needs through our specialist blending facilities. For example, a pasture with a high grass composition will respond better to nitrogen whereas a clover dominant pasture is more potassium (K) responsive, depending on existing nutrient levels in the soil.

Soil and tissue tests can be used to determine current levels of various nutrients and identify those that are deficient, which can then be supplied in a tailor made blend for your property.

NUTRIENT REMOVAL IN HAY.

To maintain plant production in hay paddocks, nutrients must be replaced at a rate at least equal to that which is removed with the hay.

The table below provides a guide to the total kg/ha of nutrient removed by a 4 ton/ha hay crop.

Nutrient	kg/ha removed
Phosphorus (P)	12
Potassium (K)	60
Sulphur (S)	8

To replace these amounts of P, K and S requires the application of approximately 250kg/ha of Super Potash 1:1.
250kg of 1:1 is equivalent to 10.75kg/ha of P, 62.5kg of K and 13.75kg/ha of S.

TIMING.

We need to work backwards from when you intend to cut. In general this is 6 weeks for silage and 8 weeks for hay. Pastures will respond better if a short lock up prior to spreading is possible. 1000kg/DM/ha provides an ideal leaf area index to enable rapid uptake of nitrogen. If boosta is applied later than optimum, good yields can still occur, with much improved regrowth potential post harvest. To ensure quality of hay or silage, adequate weed and insect control is essential.

By Jane

Nitrogen responsive pasture

Typical view of Potash responsive spring pasture

MAINTAINING HEALTHY SOILS ON YOUR FARM

By Bruce Lewis
Agronomist Vickery Bros

The soil is one of the most important and fundamental assets in any broad acre farm and the health and productivity of soil is vital to the long term sustainability. Farms with high quality healthy soil offer farmers greater scope to maintain productivity in tough times and to manage risk through the ability to produce commodities for a wider range of markets.

Soils health can be measured using physical, chemical and/or biological data:

- Physical measurements may include density, soil texture which takes into account sand, silt, clay and organic matter composition, soil dispersion or slaking, soil toughness or hard pans (penetration measurements) and water infiltration rates.
- Chemical measurements are now performed routinely to measure soil nutrient status of elements like phosphorus, sulphur, potassium. Organic matter is routinely measured in cropping soils. Available nitrogen is also measured in soils to predict crop nitrogen requirements but needs to be sampled over a depth of 0 to 60cm to be reliable. Soil pH, soil aluminium and soil cation balance are measured to predict lime and gypsum needs. Soil salt levels are easily measured and can be critical in determining soil health. Plant tissue testing is more commonly used to measure trace element status of soils because soil tests for trace elements are not well calibrated for Australian soils.
- Soil biology is a critical component of a healthy soil as soil biota are essential in many of the soil processes necessary for plant growth. Soil biota can produce immense benefits such as nitrogen fixation by rhizobium bacteria with legume crops and pastures. Soil biota can also present challenges such as the root diseases crown rot, rhizoctonia, take-all and pythium. There is general consensus that soil biology is critical for productivity and sustainability. Measuring and managing soil biota in the soil is difficult due to the immense population in a single gram of soil. The rapid changes of soil biota to rainfall events, seasonal temperature variation, type of crop or pasture or farming practices makes measurement and management even more difficult. Research organisations such as the Grain Research and Development Corperation are now funding research programs to better understand and manage soil biota. Soil biology is of keen interest to many farmers and there are a plethora of products on the market claiming to better manage the underground life of soil and improve soil health. Good soil health and good soil biota seem to go hand in hand. Soil biota respond, like pastures and crops we grow, to food and water. The main food for soil organisms, whether large ones such as earthworms or small ones such as bacteria, is organic matter. Soil scientists believe the chance of improving plant growth with broadcast microbial inoculants is low.
- This season Vickery Bros have put in pasture trials to test soil additive products that have been inoculated with biological organisms. The reason for setting up the trials is so that the benefits of these new products can be measured and compared to other traditional products. This will enable Vickery Bros recommendations to our clients to be based on sound knowledge from measured outcomes from these trials. The trials are being conducted using accepted scientific protocols such as sufficient replication, statistical analysis of measured results etc. As well as plant growth rates a range of soil and plant measurements are being taken to assess the potential soil health benefits.

HIGH PERFORMANCE PASTURES

By Bill Feely

The aim of all producers is to get the most out of their pastures in a sustainable way in order to maximise farm profitability. Unfortunately often the quality and quantity of pasture produced does not meet our animal's production requirements. These feed gaps can be filled with summer crops and supplementary feeding, however at times both can be expensive and variable in there efficiency. An alternative to these two options is the use of High Performance Pastures (HPP). These special purpose pastures can occupy between 10 to 20% of the total farm grazing area and provide producers with grazing flexibility, increased production and improved sustainability whilst complementing the existing perennial pastures. The composition of these pastures is determined by the timing of your feed requirements.

WINTER PRODUCTION:

The composition of a HPP to achieve improved winter production is based on the use of Short Rotational and Italian ryegrasses complemented with annual clovers. The biggest issue is to decide whether to use tetraploids or diploids as the grass cultivars. The tetraploids are more palatable due to their larger cell size and water content, it is due to this palatability that intake and consequently animal performance is increased. However this does make the tetraploids susceptible to overgrazing and the potential to be grazed out quickly if not managed properly.

Tetraploids should be grazed down to no less than 5 cm in height and not grazed again until the 2.5 to 3 leaf stage. Leaf emergence is dependant on the time of year and seasonal conditions however it would be expected the grazing interval would average 25 days.

The tetraploids have a higher fertility requirement and thrive under moist or irrigated conditions.

Diploids on the other hand are more lignified and have less water content. Due to this they can be grazed harder, generally down to 2-4 cm and will persist longer than the tetraploids. They are usually suited to drier conditions and lower fertility. Interval period between grazing with diploids is generally 14-25 days however this is again dependent on time of leaf emergence. Grazing is targeted at the 2.5 to 3 leaf stage.

NITROGEN USE:

The strategic use of nitrogen (N) is a valuable tool that enables these types of HPP pastures to increase production and help fill feed gaps during tough times. These types of pastures can be expected to respond well to N, although it is imperative that all other nutrients are not lacking. As always it is recommended that a soil test is carried out prior to the establishment of the HPP to ensure soil conditions and plant nutrients are not limiting. Responses to N vary but one would expect 1 kg of N /ha would equate to 10 kg/ha of DM in winter this would increase to between 15 –20 kg/ha of DM in spring. The other bonus with using these types of pastures is that surplus high quality spring growth can be conserved as silage or hay. Silage quality can be improved, in particular with tetraploids, due to their high water soluble carbohydrates, which helps fermentation.

Winter HPP species:

HPP Grasses that would be suitable in winter mixes to achieve more than 2 years production.

	Ploidy	**Sowing Rate**	**Companion Species**
CRUSADER	Diploid	15-20 kg/ha	Leura 6 kg/ha Irrigation White 1 kg/ha Waverly White 1 kg/ha
MAVERICK GOLD	Diploid	15-20 kg/ha	
FEAST 2	Tetraploid	20-25 kg/ha	
GALAXY	Tetraploid	20-25 kg /ha	

The suggested winter HPP mix would contain one or two of the grass cultivars with the companion species.

SUMMER PRODUCTION:

The use of clovers and herbs in a HPP is a way in which producers can increase productivity and help finish stock during the summer months in lieu of a typical summer crop. With a legume and herb pasture animal intake is higher and consequently so is the resultant animal growth rates. Of the two herbs, chicory is predominately summer active although there are winter active cultivars and plantain offers year round production. In addition to there improved quality the use of plantain and chicory has increased due to their resistance to attack from Diamond Back Moth which has plagued the growing of summer crops the last few years. It has also been well documented that the herbs have some anthelmentic qualities i.e. it is basically a biological drench. An added bonus with the herb and legume based pastures is that when staggers are an issue these pastures can be grazed without the fear of stock becoming affected.

ESTABLISHMENT:

Many producers mix chicory and plantain with rape and turnips to produce summer feed that they then oversow with grasses in the autumn. Alternatively producers can sow the herbs and legumes as a HPP in mid to late spring.
Lucerne is often included as a component of the HPP mix so it is necessary to carry out a deep soil test (0-60cm) in addition to the 0-10cm test to ensure adequate plant nutrient is available also to determine if there is a need to apply lime or dolomite to correct the soil pH.
The use of tap rooted species such as chicory, plantain, lucerne and Arrowleaf clover are also beneficial in that they help aerate the soil, encourage clover root systems to expand and extract sub soil water. The herbs are not legumes so they do have a nitrogen requirement partly supplied by the legumes that are sown with them.

Summer Active HPP.
Well drained loam with a soil ph less than 6 ($CaCl_2$).

Puna (Summer Active)	Chicory	2 kg/ha	tap root
Tonic	Plantain	2 kg/ha	tap root
Haifa	White Clover	2 kg/ha	stoloniferous large leaf size
Irrigation	White Clover	2 kg/ha	stoloniferous medium leaf size
Astred	Red Clover	4 kg/ha	stoloniferous medium leaf size
Nitroplus	Persian Clover	1 kg/ha	hard seeded
Arrotas	Arrowleaf Clover	4 kg/ha	tap rooted hard seeded large leaf size

Alternatively the addition of a continental type (summer active) Tall Fescue at 4 kg/ha could also be included.

Clay loam with a soil pH > 6 ($CaCl_2$)

Puna 2 (summer active)	Chicory	2 kg/ha	tap root
Haifa	White Clover	2 kg/ha	stoloniferous large leaf size
Prime (winter dormant)	Lucerne	8-10 kg/ha	tap root
Resolute Tall Fescue		5 kg/ha.	

MANAGEMENT:

The life expectancy of these types of pastures is generally no more than 4 years, this is of course dependent on how well the pasture is established and managed. Irrespective of which species are sown it is paramount that nutrient applications reflect the longer growing periods and higher production of these pastures over the traditional perennial pastures.
The biggest drawback when trying to establish these pastures, particularly the herb and clover HPP, is the weed issue. The obvious solution is to eradicate the problem weeds beforehand, through a winter cleaning or spray topping program the year prior to establishment. Alternatively a combination of a pre-emergent chemical and a higher sowing rate would help. The practice of cross sowing the pasture, while time consuming, also aids in achieving good ground cover, quickly reducing weed invasion. The addition of 8-10 kg/ha of stoloniferous clovers plus the herbs also prevents the weeds from gaining a foot hold. Once established the herbs can be treated in a similar way to lucerne with regard to their tolerance to certain chemicals.
The main criteria for managing these types of pastures, to ensure their productivity and persistence are that they be rotationally grazed.

There is no doubt that HPP are a high input system. However with a 20 % increase in carrying capacity, through an increase in pasture production, and the benefits of improved quality at critical times of the year these pastures can undoubtedly justify their existence.

Typical crop of plantain and chicory with some brassica still evident.

SOIL AND TISSUE TESTING:

By Harry Armstrong

Soil and tissue analyses are valuable tools for producers to establish fertility levels and help determine the best approach for optimizing nutritional requirements of crops and pastures. Regular test results provide a powerful decision making tool for producers to use when deciding which type of fertiliser to use and the appropriate application rate to achieve the most profitable outcome. Soil tests also provide an accurate assessment of both soil pH and aluminium levels, which are important factors in determining whether a liming program would be profitable.

SOIL OR TISSUE?

Soil testing is a reliable and accurate method of determining the macro nutrient status (phosphorus, potassium, sulphur and calcium), while tissue testing is by far the most accurate technique for identifying and monitoring levels of trace elements in our pastures and crops. In our region the most common trace elements deficiencies are molybdenum and copper. While deficiencies such as iron and manganese in pastures do occur in high pH soils, they are extremely rare in this district, so please be very wary of people promoting "wonder formulations" containing a wide range of trace elements. Nutrient recommendations should be based on solid information.

Vickery Bros are able to custom blend fertilizers containing trace elements for both animal health and pasture requirements at our depots.

PHOSPHORUS BUFFER INDEX (PBI):

Most recent soil tests from (IPL) will include a PBI value. This enables us to predict how much phosphorus needs to be applied to raise the Olson P of a paddock by 1mg/kg. Basically heavier soils have a higher **buffering capacity** than lighter sandy soils. Organic matter and clay type can also effect PBI. Therefore heavier soils will require higher rates of applied P to raise the Olson P compared to lighter sandy soils. We have always known this to be the case, but the PBI gives us a value for each soil type which enables us to more accurately predict what the likely response would be of applying higher rates of phosphorus.

TIMING

Soil tests can be taken at almost any time of year. However if you have been regularly sampling for example during autumn then it would be wise to continue sampling at or around that time. Tissue sampling is generally done at the height of the spring flush (earlier for copper), which in most areas is October. This is also a convenient time to do soil sampling on most properties as it allows plenty of time for test results to come back and to assess the nutrient requirements for the next season. Soil testing should not be carried out sooner than 3 months after fertilizer applications. Applications of urea have less effect on soil test results.

The experienced agronomy team at Vickery Bros is available for soil and tissue testing at any time. If you are considering testing this spring please call the team at Vickery Bros for further information and/or an appointment.

Your samples are sent to the Nutrient Advantage Laboratory at Werribee, a fully accredited and independently audited facility. Turn around time for both soil and tissue tests is around 2 weeks. Please be wary of soil testing laboratories that are not accredited with the Australian Soil and Plant Analysis Council (ASPAC) and the National Association of Testing Authorities (NATA)

COST

At approximately $100 per test, soil and tissue testing represents excellent value for money given they provide such valuable tools to formulate a fertilizer strategy which is often one of the largest expenditure items in many farm budgets. When you consider the potential cost savings or extra profit that can be generated from regular soil and tissue test data, it's a wonder much more testing is not undertaken.

DESIRABLE NUTRIENT LEVELS IN SOIL AND TISSUE TESTS:

PASTURE SOIL TESTS

Beef / Sheep pastures.
P (phosphorus) > 15mg/kg (Olson P)
K (potassium) > Adequate levels range from 80 to 300 depending in soil type.
(Lighter soils have a lower requirement than heavy clay soils.)
S (sulphur) > 10

Dairy Pastures.
In general dairy farmers should aim at > 20mg/kg (Olson P) and similar or slightly higher levels of K and S as those mentioned above.

Grass Tetany.
To determine if Grass Tetany is likely to occur in a paddock you need to refer to the Total Cation Exchange Capacity section of the soil test report.
You need to divide the total of the calcium + magnesium by the potash.
If the ratio is higher than 0.08 then Grass Tetany is a possibility.

PASTURE TISSUE TESTS:

N% (Nitrogen)	3.0 - 3.2
P% (Phosphorus)	0.28 - .32
K% (Potassium)	1.0 - 2.0
S% (Sulphur)	0.19 - 0.25
Ca% (Calcium)	0.8 - 1.0
Mg% (Magnesium)	12 - 0.15
Cu mg/kg (Copper)	3.5 - 4.5
Zn mg/kg (Zinc)	10 - 15
Mn mg/kg (Manganese)	15 - 20
Fe mg/kg (Iron)	50 - 75
B mg/kg (Boron)	15 - 20
Mo mg/kg (Molybdenum)	0.10 - 0.20

SUMMER CROPS

By Harry Armstrong

In many cases pasture renovation is the prime objective of a fodder crop program, hence the paddock selected is often of lower fertility than the rest of the farm.
Soil testing prior to a summer crop is advisable to identify nutrient (including lime) requirements. Summer crops require a minimum of 20 kg of P and will often respond to nitrogen applied 3 weeks after emergence.
Vickery Bros have the capability to formulate and accurately apply appropriate fertiliser and seed blends to your summer crop. Mixing seed with fertiliser and spreading using one of the 4WD, GPS equipped, AFSA accredited spreaders saves considerable time and effort compared to using bags and conventional seeding equipment. Spring is a busy time and anything that saves time and improves the timeliness of sowing is worthy of consideration.

Insect Damage:
Diamond back moth larvae have taken their toll on Brassica crops in recent years. Spraying has proved to be expensive and often not all that effective. Our agronomy team have identified a few points that can help crops cope with this challenging pest.

- Keep sowing rates on the low side. High plant densities create moisture stress.
- Avoid sowing out headlands.
- Be prepared to graze crops early if under attack from larvae.
- Crops under stress seem to attract pests.
- Apply correct rates of fertiliser at sowing.

Autumn:
An assessment of weed control needs to be done in autumn before deciding on whether to go straight into a permanent pasture or go for an annual hay/silage type pasture. (See High Performance Pastures article) The latter option allows scope for further applications of herbicide prior to the permanent pasture phase. Difficult to control perennial weeds such as Bent Grass and Fog Grass may need this extra year under annuals to allow for further applications of herbicide to gain adequate control.
If pasture renovation is the prime objective, spray out crops and resow pasture at first autumn rain. Don't delay pasture sowing (annual or perennial) for the sake of a few weeks extra feed from fodder crops.

TAKE HOME MESSAGE

- Maximize use of spring rain with intelligent nitrogen use.
- Maintain adequate soil nutrient levels for sustainable hay and pasture production.
- Soil and tissue test now to plan 2006 fertiliser program.
- Consider your options regarding special purpose pastures and crops.

For the best advice on strategic and profitable nitrogen application use this spring contact the professional team at Vickery Bros

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