GRASSLAND SOCIETY OF NSW INC.

Newsletter

Welcome to the last newsletter for 2018 - I know I say this every year, but how can it be December already? I saw two posts on social media recently that really sum up my relationship with time " I still think 1990 was 10 years ago" and "When you realise people born in 2000 were 18 this year". I am sure many of you can relate.

For most 2018 has been a tough year, but some recent rain across many areas of the state have hopefully given everyone a boost as we slide in 2019.

Being a non-conference year the main focus of the Grassland Society this year has been the successful Pasture Update series which finished on a high with three great events at Berry, Cudal and Holbrook in September and October. Reports from each event can be found on pages 2 and 3.

Canola is increasingly being used as a source of early fodder, with minimal penalty to yield and quality or to the benefits it provides as a break crop in southern NSW. An article by Jeff McCormick and colleagues on page 4 outlines their study looking at the gradual adaption of cattle to canola and if there is an impact on cattle growth rates over the grazing period.

We also continue with a series of articles modified from the temperate perennial pasture establishment guide - steps to ensure success published by the NSW Department of Primary Industries on pages 5 and 9. The full temperate perennial pasture establishment guide is available at www.dpi.nsw.gov.au/tppeg

I hope everyone has a happy, safe and relaxing festive season and we will see you all in 2019 for a conference (details TBC), another round of Pasture Updates and of course the newsletter.

Carol Harris, Editor

GIVE THE GIFT OF MEMBERSHIP

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Don't forget to renew your Grassland Society of NSW membership subscription.

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Don't forget to add your name to the comments box so we know you have paid.

In this newsletter

Cudal and Holbrook

In two terrific days, attendees at Pasture Updates at Cudal and Holbrook heard and saw the 'nuts and bolts' of grazing crops.

Held in conjunction with NSW DPI, "Managing dual purpose grazing cereals" got the full 'work over'. Attendees topped 100 at Cudal and 75 at Holbrook, with some people travelling 300 km to hear and see what all the fuss about 'grazing crops' is. Much of this fuss is the making of very significant 'grazing dollars' in the early part of the crops' vegetative growth period and the risk management that this offers to a business. Not to mention the opportunistic grain yield should the season go your way. Both MLA and GRDC have huge investments in the respective 'ends' of the grazing crops, and it was terrific to see both those 'ends' presented at these updates.

Frank McRae from AusWest talking over ryegrass options at Manildra

Dr Felicity Harris (NSW DPI) set the scene with how plants develop. Understanding when is a safe period to graze, and up to when, enables growers to get the best from both the grazing opportunity and grain recovery. She covered at length the importance of 'vernalisation' and 'photoperiod' as key triggers in the long season grazing wheats, and how they can impact a grower's decision making process, and potential early sowing time.

Peter Matthews (NSW DPI) took the planting opportunity further with the basics of good crop agronomy. Being ready to sow on time, and what that early planting potentially meant in terms of dry matter production in cereals and grazing days.

Dr John Kirkegaard (CSIRO) did similar for canola at Holbrook, highlighting what crop diversity can offer in terms of rotation, without forgoing the grazing opportunities.

David Harbison (D R Agriculture Pty Ltd) covered soil nutrition. A particular focus for getting the most dry matter in the early months from grazing crops is sound pH, adequate 'up front' nitrogen (N) and phosphorus (P), and then managing additional N for grain recovery. Much of the 'grazed nutrient' is recycled back onto the paddock via the animal, but growers need to be aware of where their individual paddock pH and fertility is in order to get the best from it.

Helen Burns (NSW DPI), talking on soil acidity, gave attendees a real insight into "pH management" in the minimum tillage environment of today. Rated the most relevant topic over both days, soil acidity is worrying many producers and impacting on people's production levels. Helen emphasised the need to look more thoroughly at pH, even in 5 cm depths instead of 10, and further down the profile. Identifying where that 'acid throttle' really is may mean 0-5, 5-10, 10-15, and 15-20cm samples are necessary, but the results can significantly help in directing any remediation action that is required.

Brett Littler (NSW LLS) spoke of grazing management, animal health issues that may arise, and adding certain supplements to balance the animal's nutrient needs to get best animal performance.

Stuart Tait (Producer at Mandurama and Nuffield Scholar, sponsored by MLA) shared what he saw and learned from his international travels. Technology is everywhere, harnessing the best of it and getting value in a grazing business is still challenging. Stuart also added animal performance data from grazing crops and how that works in his business, particularly the strongly positive grazing returns achievable even

Helen Burns (NSW DPI) explains acid soils, their impacts and where it is occurring at Holbrook

before the crop is destocked and set for grain.

Frank McRae (AusWest Seeds) covered many of the alternative forage options available to producers should they not wish to take on the grazing cereals. Getting plenty of attention were the short term ryegrass options, particularly with their ability to be run in conjunction with the grazing crops and give producers high performing fodder to move stock onto once the crops are 'locked up'.

Post lunch, Peter Matthews and the trial co-operators walked attendees through the extensive trial sites at Manildra and Holbrook. Given the season, credit must go to the co-operators on their management to allow such crops to perform as well as they have, and we thank them greatly for allowing us all to see what can be achieved.

All in all, two fantastic days. Key messages were there for the taking, much of it about understanding the variety, or species, you are growing, doing the basics well (moisture conservation, on time sowing, sound soil fertility and 'top up' N) and practicing good grazing management.

Report prepared by David Harbison

Berry

With the drought continuing on the South Coast of NSW this year's Pasture Update held in Berry had a change in focus with presentations on managing drought conditions. The day wrapped up on a positive note looking at managing kikuyu when it rains again.

A keen group of 50 producers and advisors heard from a variety of speakers on weather conditions, livestock requirements, the importance of quality fodder conservation and managing pastures through dry periods.

Helen Smith, Agricultural Advisor with South East Local Land Services discussed the current seasonal outlook, explaining that the coast is a highly variable area and weather predictions are not as accurate as land managers would like them to be. Ms Smith concluded that even though these predictions often sit between 50-60% chance of a drier than average, underpinned with past accuracy levels being low, on farm decisions and planning are important to ensure your business is protected.

Ms Smith's concluding statements were strongly re-iterated by the following two speakers John Piltz, Research Officer and Neil Griffiths, Technical Specialist, Pasture Production both from NSW Department of Primary Industries.

Mr Piltz discussed the importance of metabolisable energy (ME) and that this is often the first limiting factor in most ruminant diets. ME is used to calculate whether stock are receiving enough energy for maintenance or production and if limiting livestock condition can quickly decline. Mr Piltz highlighted that the stage of growth/ maturity of the plant has a strong positive correlation to ME, such that the higher the ME the better the liveweight gain. Therefore testing the feed products for nutritive quality can help inform your decisions and provide a level of resilience against the impact of drought.

In drought there comes a time when pasture growth almost comes to a halt and livestock intake outweighs pasture production. Mr Griffiths discussed these triggers points and why it's important to protect the plants by not overgrazing and protecting the soil from erosion. Weed management often starts to come into play with the onset of moisture, even though it's not enough to call it rain.

Along the coastal strip of NSW a number of invasive grass (e.g. giant Parramatta grass, serrated tussock), broadleaf (e.g. fireweed, fleabane) and environmental (e.g. Crofton weed, blackberry) weeds will require ongoing monitoring and management.

After a hearty lunch, the focus of the day changed into the positive, that it will rain again and when it does how producers can manage kikuyu for maximum production. Mr Basil Doonan, Principle Consultant at Macquarie Franklin discussed optimising quality, quantity and persistency for animal production. Mr Doonan started the discussion by identifying key profit drivers and highlighted that pasture utilisation is a key driver. In kikuyu pastures it is the quality that can be limiting not the quantity and by focusing on the three important aspects of grazing management, interval, intensity and duration producers can have high quality kikuyu pastures. Rotational grazing will maximise the quality of a kikuyu pasture as long as it's based on the leaf stage, assuming there are no other limiting factors such a low soil nutrient levels.

To support the information presented by Mr Doonan, Amanda Britton, Senior Agricultural Advisor, South East Local Land Services shared her results of a two year trial that investigated the growth rates, season and productivity of kikuyu dominant pastures under seven different rates of nitrogen applied every four or eight weeks. Ms Britton, discussed that the seasons locally are changing and that producers need to consider different options when managing pastures. Measuring the growth rates of kikuyu, producers can fodder budget with more accurate figures and through the strategic applications of nitrogen, kikuyu growth and quality can be extended into late autumn/ early winter.

Overall, the pasture update was a successful and informative day, with producers eagerly awaiting solid rainfall to put their new knowledge into practice. These updates would not be possibly without the support of the Grasslands Society of NSW and funding from MLA, both of which are thanked for making these updates possible.

Berry Pasture Update attendees enjoying the presentations in the morning session.

Report prepared by Amanda Britton

Cattle adaptation to dual-purpose canola.

Dr Jeff McCormick, Dr Shawn McGrath and John Paulet.

Charles Sturt University, Wagga Wagga NSW.

Dual purpose canola has potential to fill the winter feed gap in southern Australia, provided it is well managed.

Canola forage has high metabolisable energy (ME) and crude protein (CP) and therefore should lead to high live weight gains. There has been several reports of animal health issues of cattle grazing canola crops including nitrate toxicity, polioencephomalacia (PEM) due to high sulphur levels, goitre due to glucosinolates and bloat. Glucosinolates are unlikely to cause a problem as canola has been specifically bred to have low glucosinolates in the seed which also results in low glucosinolates in the leaf. Previously some animal health problems have been exacerbated when cattle have grazed droughted canola as opposed to dual-purpose canola in winter which is grown under adequate moisture. Extension literature indicates that cattle should be adapted onto canola by taking them on and off over a period of 10-14 days to allow rumen microflora to adjust but there are no scientific studies that demonstrate what period of adaptation is required. Farmers on mixed farms are unlikely to undertake an adaptation period due to labour constraints.

We investigated whether a gradual adaption to canola would result in higher cattle growth rates over the canola grazing period by limiting health issues. Angus heifers (n=48) were grazed on dual-purpose canola from July 2 to August 6, with four different adaptation treatments: immediate introduction at the beginning and end of the first week and four- and seven-day gradual adjustment.

At the start of grazing there was 2.92 T/ha of dry matter available with more than half of that being the leaf. Metabolisable energy and CP in the leaf was high (13.8 MJ/kg and 28%, respectively). Nitrate levels in the leaf were very low (<1000 ppm) whereas in the petiole it accumulated to greater than the critical level (>5000 ppm). Nitrate has to be converted to amino acids before moving into the leaf lamina. Therefore grazing in which only removes the leaf will result in very low risk of nitrate toxicity. This can be done by ensuring that that there are high forage levels available allowing animals to select the leaf lamina.

Sulphur level was 0.46% which was greater than recommended levels (0.4%) despite no sulphur fertiliser being applied. There were no visible animal health issues related to PEM observed. It is therefore unknown what may occur if high levels of S are used before sowing such as gypsum and ammonium sulphate. This is an area of further research.

Very limited evidence of bloat was seen in this experiment with only animals observed to have slight distension during early periods of grazing.

Heifers achieved mean daily weight gains of 1.75 kg/day for the period of the experiment with minimal animal health issues across all treatments. Growth of cattle introduced to canola with no adaption did not differ significantly to animals introduced over a four-day period (63.2 kg v. 66.5 kg; P>0.05), however, the growth of animals adapted over 7 days was significantly lower (55.0 kg; P< 0.05). There is however a lag phase of growth in the first week of being introduced to the crop where cattle achieved low growth rates. Following adaptation daily growth rate commonly exceeded 2 kg/day. For this reason canola needs to be grazed for a period of a month at least to achieve maximum benefits.

The different adjustment treatments seemed to have little effect, aside from reduced time on the crop potentially reducing growth rates. The only observed livestock health concern was loss of hair and runny faeces, but the growth performance (mean 1.75 kg/day) indicated these issues were unlikely to have affected production.

Grazing canola with cattle does have risks similar to the introduction of any new forage for cattle. Following these management tips will reduce animal health risks.

Management tips on introducing cattle to canola;

1. Reduce pre-sowing sulphur fertilisers for grazing crops. This effect has not been demonstrated but the occurrence of PEM appears to be

Cattle grazing canola as part of the study investigating if gradual adaption to canola would result in higher cattle growth rates over the canola grazing period.

one of the most important potential health risks. Applying ammonium sulphate after grazing would supply S to the crop.

2. Ensure cattle are well fed. Hungry cattle are more prone to health issues. Commonly pastures provide low levels of biomass during the autumn/winter period and therefore must ensure that cattle are fed high quality hay. Introducing cattle mid-late morning during the adjustment period will reduce risks. Cattle eat a large proportion of their daily requirement early morning and therefore will not gorge when entering the crop.

3. Move cattle on and off the paddock for a period of a week. Although in this instance we did not see any negative health problems adjusting the animals over a period of time will reduce any negative outcomes. Start for two hours and increase by two hours every day carefully observing if the cattle are eating the canola and if there are any health problems.

4. Provide hay in the paddock to allow cattle to select different forage. This will enable cattle to substitute hay for canola in the diet and increase dietary fibre levels.

5. Watch to ensure cattle eat the crop. During the adjustment period the cattle need to eat the crop. If they are grazing fence lines or any other non-crop areas it is unlikely the animals have been adjusted.

Weed control prior to sowing pasture

Editors Note: This article "Weed control prior to sowing" is a continuation of a series of articles modified from the Temperate perennial pasture establishment guide - steps to ensure success published by the NSW Department of Primary Industries.

The Temperate perennial pasture establishment guide is available at www.dpi.nsw.gov.au/tppeg

A weed-free seedbed is essential to ensure the success of a new pasture. A variety of strategies can be used to control weed populations. For best results,planning should begin two years prior to sowing.

Weed identification the first step

Identify the weeds present and understand their life cycle in order to choose the best management options. This should begin at least two years prior to establishing new pasture.

Annual grasses such as barley grass (*Hordeum leporinum*), vulpia (*Vulpia* spp.), ryegrass (*Lolium rigidum*) and brome grasses (*Bromus* spp.) are particularly difficult to manage due to their prolific seeding and staggered germinations. There are no herbicides available to control these weeds in seedling grass pastures so they must be targeted to prevent seed set and avoid a build-up of the weed seed bank.

A control program commencing two years prior to the new pasture being established is also recommended for heavy infestations of hardy perennial grass weeds such as couch grass (*Cynodon dactylon*), bent grass (*Agrostis capillaris*) and serrated tussock (*Nassella trichotoma*).

Weed species that produce hard seeds, such as thistles and sorrel (*Acetosella vulgaris*) may need a longer term strategy as the seeds can remain viable in the soil for more than five years. Even the hard seed of desirable species such as clover can be an issue if seed numbers are high and they compete with less vigorous grass or lucerne seedlings.

Caution - If herbicides are to be included in your weed management program:

Boom sprays should be calibrated regularly to ensure accuracy of pesticide applications.

Check herbicide labels for plant back periods for pasture species if residual herbicides are used.

Check herbicide labels for stock withholding periods.

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Weed control prior to sowing

Two years prior to sowing: A weed control program starting two years prior to sowing will run down weed seed banks and reduce weed populations in the establishing pasture. There are a number of chemical and non-chemical techniques that can be used.

1. Spray topping or pasture topping

Spray topping or pasture topping is an effective, lowcost technique that involves the application of a low rate of a non-selective herbicide (either paraquat or glyphosate) after head emergence to sterilise the seed.

It is used to reduce the seed set of a number of annual grass weeds (barley grass, vulpia species, annual ryegrass and brome grass) and some broadleaf weeds, such as capeweed (*Arctotheca calendula*), saffron thistle (*Carthamus lanatus*). There will be limited effect on the quality and quantity of available feed.

The success of the technique relies on correct timing of the herbicide application (see below for details). Evenness of head emergence is essential for effective topping.
This can be achieved through heavy grazing or slashing during winter and spring. Stock should be removed 2 to 3 weeks prior to the targeted growth stage of the dominant weed species.

Herbicides used for spray topping

The herbicide is applied at a low (sub-lethal) rate, so in order to prevent development of viable seeds, it is critical that the time of application to coincides with the vulnerable stage of the weed. There should be a 2 to 3 week spray window. MAKE SURE YOU READ THE LABEL.

Glyphosate (e.g. Roundup®) must be applied at flowering for capeweed and annual ryegrass and from early head emergence (50% heads emerged) to milky dough stage of seed development for other grasses, in order to sterilise seed. Spraying too early may result in regrowth, and too late will reduce the effectiveness of control as many viable seeds will still be formed.

2. Paraquat (e.g. Gramoxone®) is a more appropriate choice of herbicide if the target weed has developed beyond the flowering stage. However, timing is critical – it must be applied when all heads have emerged and there are initial signs of haying-off. This narrow spray window means that paraquat is not ideal in situations where several weed species are being targeted or in paddocks where landscape variability results in uneven maturity.

Annual grass weeds

Barley grass and brome grass
Glyphosate is a good option for barley grass as the species often produces seed heads over an extended period of time. It should be applied after the seed heads have emerged, but prior to dough stage in the grain. Paraquat should be applied after flowering.

Vulpia species
Timing is particularly critical for paddocks with vulpia infestations as plants progress very quickly from flowering to seeding once they are moisture stressed. Apply glyphosate at the early head emergence stage. Paraquat should be applied just prior to haying-off.

Annual ryegrass
Glyphosate needs to be applied during flowering and when all tillers are in head. Paraquat should be applied when seed in most heads is in the dough stage.

2. The "spraygraze" technique for broadleaf weeds

Spraygraze is an option for management of a range of broadleaf weeds in established pastures. It can be very effective against weeds such as: thistles, shepherd's purse (*Capsella bursa-pastoris*), Paterson's curse (*Echium plantagineum*), charlock (*Sinapis arvensis*), mustards (*Sisymbrium* spp.), wild radish (*Raphanus raphanistrum*), dock (*Rumex* spp.), sorrel (*Acetosella vulgaris*) and capeweed (*Arctotheca calendula*).

The technique involves the use of sub-lethal rates of herbicide such as MCPA or 2,4-D amine, in combination with tactical grazing. The target weeds should be sprayed no more than 6 to 8 weeks after germination, when they are still in the rosette stage and actively growing. Any clovers present need to have at least 4 trifoliate leaves to tolerate the herbicide. Spraying smaller, less developed clovers will severely affect their capacity to recover.

Once the stock withholding period (7 to 10 days) of the herbicide has passed, the paddock should be stocked with at least 5 times the normal stocking rate for a short period, using older or non-breeding stock. Sheep are more effective than cattle with this technique.

The herbicides cause the broadleaf weeds to wilt. Plant sugars levels rise and the target weeds become more palatable and attractive to stock. The herbicide also promotes more erect growth, making the weeds' growing points more accessible to grazing and damage by stock.

This technique relies on the combination of sub-lethal application of herbicide, high grazing pressure and subsequent pasture competition to kill the target weeds. Weeds are likely to recover if the paddock is not heavily stocked. The technique works best on smaller paddocks, i.e. less than 20 ha.

Caution:

Check herbicide labels and seek advice from an agronomist before using the spraygraze technique on lucerne and medic based pastures. MCPA herbicides may damage lucerne and medics plants.

Improved palatability and greater intake of some broadleaf weeds may cause livestock health issues when animals graze potentially poisonous plants such as Paterson's curse, variegated thistle (*Silybum marianum*) and caltrop (*Tribulus terrestris*).

3. Winter cleaning for vulpia control

Winter cleaning can be used to selectively remove *Vulpia* spp. (silver grass) in the winter two years prior to sowing. Best results are achieved when pastures are grazed short and are free of dry residue from the previous spring. Simazine is the main herbicide used for vulpia control, with application rates varying depending on weed density, soil type and plant development. Application should occur when the clover has at least 3 trifoliate leaves, 6 to 10 weeks after germination. Simazine can be mixed with other grass or broadleaf herbicides to control a wide range of weeds.

This technique is not recommended if winter feed is likely to be limited as there may be a short-term effect on the growth of some legumes and desirable grasses.

4. Slashing

Slashing paddocks in the spring up to two years prior to sowing begins the process of reducing dry matter and reducing weed seed set. This technique can be used in paddocks that contain weeds that are of low feed value and not worth conserving for fodder. Slashing can reduce the amount of weed seed set, but regrowth must be managed in order to significantly reduce the number of seeds that will add to the soil seed bank. Heavy grazing, a follow-up herbicide or additional slashing may be required in this situation.

5. Fodder conservation

Strategic cutting of paddocks for silage or hay production can very effectively reduce weed seed set, particularly when used in combination with grazing
or a follow-up herbicide treatment to manage weed regrowth and late seed set.

6. Forage and fodder crops

Growing forage and fodder crops such as forage brassica, forage sorghum or winter cereals in paddocks before sowing pasture can very successfully reduce weed competition in newly sown pastures. Vigorous, dense crops compete with annual weeds and help to reduce the weed seed bank. Refer to the appropriate NSW Department of Primary Industries publications for management guidelines for the desired crop.

Weed control in the year before sowing

Aim for complete weed control in the year before sowing to stop seed set and to accumulate soil moisture. There are a number of options to manage weeds in the months prior to sowing.

1**. Chemical spray fallowing**

A chemical spray fallow is the preferred option in the spring prior to sowing, as it gives absolute weed control, but leaves organic matter to protect the soil surface over summer. A knockdown herbicide (e.g. glyphosate) will give effective control of most annual
weeds, if it is applied before they flower and set seed.

2. Cultivated fallow

Cultivation should only be used if there is a reason to cultivate, e.g. to reduce excessive levels of plant material. It is not the preferred option for spring fallow weed control as it leaves the paddock exposed to wind and water erosion. If the soil is moist, cultivation may not kill all weeds, as a proportion may be transplanted and will require further cultivations for effective
control.

Caution:

Check herbicide labels for plant back periods or pasture species if residual herbicides are likely to be used in conjunction with the knockdown herbicide.

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Research Update

Keeping you up-to-date with pasture and grassland research in Australia. Abstracts of recently published research papers will be reprinted as well as the citation and author details in you wish to follow up the full paper.

Mineral status of reproducing ewes grazing vegetative cereal crops

David G. Masters [A F] , Serina Hancock [B] , Gordon Refshauge [C] , Susan Robertson [D E] , Marie Bhanugopan [D E] , Michael Friend [D E] and Andrew N. Thompson [B]

[A] School of Agriculture and Environment M085, University of Western Australia, 35 Stirling Highway, Crawley, WA 6009, Australia.

[B] School of Veterinary and Life Sciences, Murdoch University, 90 South Street, Murdoch, WA 6150, Australia.

[C] New South Wales Department of Primary Industries, Cowra Agricultural Research and Advisory Station, Binni Creek Road, Cowra, NSW 2795, Australia.

[D] School of Animal and Veterinary Sciences, Charles Sturt University, Boorooma Street, Wagga Wagga, NSW 2678, Australia.

[E] Graham Centre for Agricultural Innovation (Charles Sturt University and NSW Department of Primary Industries), Albert Pugsley Place, Wagga Wagga, NSW 2678, Australia.

[F] Corresponding author. Email: david.masters@uwa.edu.au

Abstract: Grazing vegetative wheat, barley and oats (both dual-purpose and traditional spring varieties) is becoming an important strategic and tactical grazing option on farms where crops and livestock co-exist. The high winter growth rates of the crops offer an opportunity to fill the winter feed gap and the high nutritive value (metabolisable energy and crude protein) makes them well suited to meet the requirements of reproducing ewes. However, metabolic disorders have been reported and many producers avoid grazing these crops with reproducing ewes because of the risk. The present study aimed to establish the mineral status of both forage and of reproducing ewes grazing wheat, oats or barley. On each of 18 farms, a group of 50 pregnant ewes was monitored. The farms were located in Western Australia (6 farms) southern New South Wales (7 farms) and central New South Wales (5 farms). The average start of grazing was 118 days (range 97–133 days) after the start of mating. Crops grazed were wheat (8 farms), barley (4 farms) or oats (6 farms) and the average period of grazing was 20 days (range 14–24 days). Samples of blood and urine were collected pre- and post-grazing from 11 to 17 ewes and samples of crop and soils were also collected for mineral analysis. A high proportion of farms had forage calcium (Ca, 70%), sodium (Na, 70%) and magnesium (Mg, 18%) below published requirements and potassium (K, 70%) above the published maximum tolerable level. Strong negative correlations were found between soil Colwell K and forage Ca, Mg and Na. Analysis of samples collected from the ewes at the end of the grazing period indicated that ewes on 94% of farms had alkaline urine and on 88% of farms Ca concentrations in the urine were in the marginal range. None of the flock-average Ca concentrations in plasma was in the deficient range, but 59% of the flocks contained some individual ewes with plasma Ca in the deficient range. A small proportion of flock-average concentrations of Mg (6%) and Na (18%) in plasma were in the deficient range. In conclusion, the forages had a complex mineral composition meaning that grazing ewes may have an increased risk of direct or induced Ca (hypocalcaemia) or Mg (hypomagnesaemia) deficiency. The low Na and high K concentrations of these crops may also pose a direct risk to livestock production. Preliminary analysis indicated higher risks from grazing wheat and from grazing crops grown on high-K soils.

Animal Production Science, 2018, 58, 2049–2060

http://dx.doi.org/10.1071/AN16530

Australian Society of Agronomy

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25–29 August 2019

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www.agronomyaustralia.org/2019-conference-wagga-wagga-nsw

The 2018 Regional Wellbeing Survey is now open

The Regional Wellbeing Survey conducted by the University of Canberra is an annual survey of residents living in Australia's rural and regional areas. It examines the wellbeing of people in rural and regional communities, and how this wellbeing is influenced by the many social, economic and environmental changes occurring in these communities.

The results of the survey enable the provision of insights that support the development of strategies to build wellbeing, resilience and adaptive capacity in rural and regional Australia.

All survey participants aged 18 or over can enter the draw with a chance to win one of 18 prizes to the total value of $7,000. You can choose to do a short or regular version of the survey. The survey is voluntary, confidential and anonymous, and closes 14 December 2018, at midnight.

Do the survey online at www.regionalwellbeing.org.au

Call 1800 981 499 if you'd like a paper survey, or for help with the survey.

Fertiliser at sowing

Editors Note: This article "Fertiliser at sowing" is a continuation of a series of articles modified from the Temperate perennial pasture establishment guide - steps to ensure success published by the NSW Department of Primary Industries.

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Most Australian soils are naturally deficient in phosphorus, sulfur and nitrogen. Fertiliser applied at sowing will ensure rapid, healthy and vigorous seedling growth.

Nutrient requirements at sowing

Knowing the nutrient status of your soil is essential prior to sowing. A soil test before sowing will help to identify potential soil and nutrient constraints and indicate fertiliser requirements.

Caution: High fertiliser rates drilled with the seed can reduce seedling germination and cause 'fertiliser burn'. The potential for damage from high fertiliser rates will be greatest in lighter soil types or when sowing into cool conditions and marginal soil moisture.

Phosphorus (P)

A soil test is the only way to confirm the amount of P required at sowing. Typically 10–20 kg P/ha should be used, depending on your soil P status. Some sowing equipment may limit the rate fertiliser an be applied, in which case additional P may need to be applied, either before or after the sowing operation.

Sulfur (S)

Sulfur is particularly important for legumes. Sulfur in the sulfate form is readily available to plants. Therefore, in situations where S is deficient or low, products containing S in the sulfate form are recommended. They will provide S to the establishing pastures more quickly than products containing the elemental S form. That form of S is insoluble and slow to become available to plants.

Nitrogen (N)

Nitrogen is often supplied in the form of a 'starter' type fertiliser at sowing. Excessive amounts of N applied with the seed can affect germination. As a general rule, do not apply more than 20 kg N/ha with the seed when sowing on 15 cm row spacing.

Note: Nodulation of legumes is suppressed by presence of soil mineral N. In most situations there is no reason to use 'starter' N when sowing legumes.

Molybdenum (Mo)

Molybdenum is a trace element that is essential for legume nodulation and N fixation. As soils acidify, Mo becomes less available to plants. It should be applied to soils with a pHCa of less than 5, every 3 to 5 years. Molybdenum can be applied using one of the following methods:

1. Mixed with herbicide applications: mix sodium molybdate in the spray tank with the herbicide used for e.g. the pre-sowing weed control operation. Use a rate of 139 g/ha sodium molybdate. Application of Mo via a boom spray will ensure even distribution across the paddock.

Caution: Check the compatibility of the herbicide with Mo.

2. As a seed dressing: molybdenum can be mixed either with the inoculant solution or dry with the liming coating material. Use either molybdenum trioxide (66% Mo) or ammonium molybdate (54% Mo). For soils deficient in Mo use a minimum of 50 g Mo/ha – i.e. 76 g/ha of molybdenum trioxide or 92 g/ha of ammonium molybdate.

Caution: Sodium molybdate is toxic to rhizobia and must not be used as a seed dressing.

3. Applied in single superphosphate fertiliser at sowing: use 0.05% Super Mo product (or equivalent) when applying superphosphate at a rate of 125 kg/ha or the 0.025% Super Mo product when applying superphosphate at a rate of 250 kg/ha.

Potassium (K)

Sandy loam soils and those with a history of hay or silage production are most likely to be low in K. It can be applied in the form of potash prior to sowing, post sowing or during the first spring. Do not drill potash with the seed as it can affect seed germination.

Fertiliser and establishment method

The most suitable type of fertiliser to use and the rate at which it is applied will depend on the method of pasture establishment. There are many compound fertilisers available that provide a balanced ratio of N, P and S (see Table 1).

Note: fertiliser drilled into the soil at sowing is 40% more efficient than fertiliser broadcast onto the soil surface.

1. Conventional cultivation

Cultivation stimulates mineralisation of organic matter. This process converts organic forms of nutrients, such as N and S, to mineral forms that are readily available to plants. Therefore, less of these nutrients is required if the seedbed is cultivated before sowing. However, mineralisation does not affect the availability of phosphorus. Fertilisers recommended for use in conventional cultivation systems include:

• Single superphosphate: contains moderate levels of P and S

• 'Starter fertilisers': contain high P levels, some N to boost seedling growth of non-legumes, but are usually low in S

• Compound fertilisers: contain a combination of N, P and S. A range of products are available.

2. Direct drilling

Pastures sown in direct drill systems do not have the advantage of the early nutrient boost from mineralisation. In the absence of

Table 1. Suggested rates of fertiliser kg/ha when establishing pasture in conventional cultivation or direct drill (nil cultivation) systems.

Sowing Method	Conventional cultivation		Direct Drill
Fertiliser	Single Super	Granulock®	Pasture Starter
N	-	11.0%	6.7%
P	8.8%	21.0%	13.5%
S	11.0%	4.0%	7.9%
Soil P Status			
Low	175 –350	75 –145	>240
Medium	125 –250	50–100	120–240
Adequate	125	50	120

cultivation, only low levels of N and S are likely to be available to the seedlings, and therefore pastures established by direct drilling require more added nutrients for early growth The risk of seedling death as a result of seed being placed in contact with fertiliser is increased in direct drill systems, particularly when high fertiliser rates are drilled with minimum soil disturbance (e.g. disc drill seeding machinery). Some seeders have the capacity to separate the fertiliser and seed. Ideally fertiliser is placed 1–2 cm below the seed.

Fertiliser and inoculated seed

Some fertilisers are toxic to rhizobia, because of their acidity. The survival of rhizobia can be improved by lime pelleting legume seed after inoculation to minimise contact with fertiliser.

Alternative fertiliser sources

Organic materials contain a range of nutrients and can be a cost-effective alternative to the more commonly used inorganic fertilisers. However, they are often bulky, and can be difficult to handle and spread. When assessing the value of these fertilisers:

• consider the nutrient requirement of the product; and

• check the nutrient analysis of each batch as nutrient levels of organic materials can be highly variable due to differences in inputs, processing, waste treatment, moisture content and storage time.

Follow-up fertiliser applications

Follow-up fertiliser requirements will depend on soil fertility and production targets. Soil tests will indicate the impact of fertiliser applied at sowing on soil fertility and should be used as a guide to further nutrient requirements. Allow about six months between the last fertiliser application and soil sampling.

Comparing fertiliser costs

When buying fertiliser compare the cost of each product based on the nutrients identified as most limiting to the pasture. Compare prices on a cost per kilogram basis for the limiting nutrients to determine the most cost-effective product, as shown in the following example:

1. Calculate the number of kilograms of nutrient e.g. P in each tonne of product.

2. To calculate the cost per kilogram of nutrient divide the price per tonne by the number of kilograms of nutrient in each tonne of product.

Example: Single superphosphate is 8.6% P 1. 1 tonne contains 86 kg of P (1,000 kg × 0.086). Assuming the cost is $450/tonne, the cost of each kg of P is $5.23 ($450 ÷ 86 kg)

A true comparison should be the cost per kilogram of nutrient delivered and spread.

NSW GOVERNMENT | Local Land Services Central Tablelands

From the President

Hello 'From the President'. I attended a field day at the "Pastures and Climate Extremes" (PACE) facility at the old Hawkesbury Ag College site (now University of Western Sydney) last week. I was particularly interested to see how the researchers were modelling the hotter and drier scenarios. I was informed, from the climate change models, that the predicted impact in the Hawkesbury district was to be a 3 degree rise, and a 60% reduction in Winter/Spring rainfall, by 2070. That is what the research is looking at, and the establishment of such looked good. Very early days yet, keep an eye out for the PACE newsletter if you wish for more. That outlook looks daunting, but then I thought, if only our rainfall reduction was for 6 months a year! I would nearly settle for that in the current times, and it made me look over the past couple of years here at home (Molong). Of the 22 months in 2017 and 2018 (year to date), only in 3 of those months have we had more than the 100 year monthly average. Thank goodness for March 2017 and September 2018 as we continue to hang on by a thread. That said, I am fully aware of the many farming folk who are yet to reach 25% of their yearly average for 2018, and we know things are extremely tough; collectively our thoughts are with you. On the back of the above rainfall deficits (and obvious pasture deficits), sadly there have been some 'very ordinary' pregnancy testing results. I have heard on many occasions of autumn calving enterprises preg testing in the last 1-2 months, to receive news of below 50% results. Some western families have not bothered joining ewes, so even when the dry does give us a break, the young stock in 2019 are not going to be there. Cash flows will be further 'hit', and rebuilding will become an even harder task.

On the upside, the MLA funded 'Grassland Society of NSW Pasture Updates' have been a great success. Following one at Berry in September attended by 51 participants, the most recent updates were at Cudal and Holbrook. In conjunction with NSW DPI, "Managing dual purpose grazing cereals" got the complete work over for the 100 and 75 participants respectively. Plant phenology, vernalisation, photoperiod, time of sowing/flowering, soil acidity and plant nutrition, grazing management, animal health issues, practical farmer experiences, and other fodder options were all discussed at length. The paddock walks gave all the opportunity to see these wonderful grazing cereal options in practice in a tough year, and what potential grain recovery can occur when the right grazing strategies are put in place. It was terrific to see both "ends" of the grazing crops covered, and a huge thank you goes to Peter Matthews and the NSW DPI team, along with the very generous support of MLA, GRDC, Local Land Services and Auswest Seeds.

Collectively, for all the Pasture Updates conducted this year, the society extends thanks and congratulations to the organisers on providing such great content, that attendees saw great value in. On behalf of the Grassland Society of NSW Inc. I would like to thank MLA for their ongoing support of this initiative.

Along with more pasture updates, 2019 sees the society's Biennial Conference being held at Gunnedah in July. Dates are yet to be confirmed, so watch for more on the society's web site for these and other activities that are coming up.

On behalf of the Grassland Society of NSW, I wish all our members, their families and friends a very safe and merry Christmas, and I hope to hear of a prosperous start in all regions of NSW in 2019. For those who have lost loved ones of recent times, this may be a difficult time for you. Take comfort as we will all be thinking of you. Stay well, think of others, and as always, don't be afraid to ask "How are you going?"

All the best,
David Harbison,
President.

The Grassland Society of NSW Inc is a unique blend of people with a common interest in developing our most important resource - our Grasslands

The Grassland Society of NSW was formed in March 1985. The Society now has approximately 500 members and associates, 75% of whom are farmers and graziers. The balance of membership is made up of agricultural scientists, farm advisers, consultants, and or executives or representatives of organisations concerned with fertilisers, seeds, chemicals and machinery.

The aims of the Society are to advance the investigation of problems affecting grassland husbandry and to encourage the adoption into practice of results of research and practical experience. The Society holds an annual conference, publishes a quarterly newsletter, holds field days and is establishing regional branches throughout the state.

Membership is open to any person or company interested in grassland management and the aims of the Society. For membership details go to www.grasslandnsw.com.au
or contact the Secretary at secretary@grasslandnsw.com.au or at PO Box 471 Orange 2800

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If you are interested in reactivating an old branch or forming a new branch please contact the Secretary at secretary@grasslandnsw.com.au or by mail at PO Box 471 Orange NSW 2800

Grassland Society of NSW Snippets

Next Newsletter: The next edition of the newsletter will be circulated in March 2019. If you wish to submit an article, short item, a letter to the Editor or a photo please send your contribution to the Editor - Carol Harris at carol.harris@dpi.nsw.gov.au or DPI NSW 444 Strathbogie Road Glen Innes 2370. The deadline for submissions for the next newsletter is February 15 2019.

Electronic newsletter: Don't forget you can receive the Grassland Society of NSW newsletter electronically. Just email your details to Janelle (secretary@grasslandnsw.com.au) and you will be added to the list. Next newsletter you will receive an email notification with a link to the newsletter on the website.

Fan of Facebook - make sure you check out the Grassland Society of NSW Facebook page. You can either search for GrasslandNSW or access the Facebook page through our web site. Pasture Update details will be posted on the Facebook page as well as the website. Please feel free to Like Us, as well as post photos of pasture and/or related topics in your area.

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This publication is prepared by the Grassland Society of NSW Inc and printed by GK Craig Printers, Orange on recycled paper