

We were very pleased to see so many of our members and visitors at our annual conference in Queanbeyan. Again it was a stimulating and successful conference. The theme was “Pasture Systems: Managing for a variable climate”. It was interesting and informative to have papers on topics that would not have been discussed a decade ago. These “new” topics were “coping with climate change” and “managing the carbon cycle – particularly the inherently slow nature of increasing soil organic carbon.” This year the Society decided to restrict the conference to two days. The bus trips, the annual general meeting and the dinner/barbeque were held on the Wednesday and papers were presented on the Thursday. The society is grateful to Professor Jim Scott for the excellent summary that he has prepared.

It was a delight to be at the conference and to be aware of the feeling of optimism about the drought breaking in so many areas and the hopes of good spring growth and hopefully little supplementary feeding would be required.

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Editorial cont.

The AGM was held in a large shed on the Gold Creek homestead block coinciding with the conference barbeque - served after the AGM! The meeting unanimously elected Mick Duncan to serve another year as our president. Our vice-president is Rob Eccles, our immediate past president John Coughlin, secretary Dianne Smith, treasurer Linda Ayres, editor Haydn Lloyd Davies and sponsorship research David Harbison. The other committee members are Richard Bloomfield, Hugh Dove, John Ive, Mike Keys, Lester McCormick, Frank McRae, Col Langford, Nigel Phillips and Jeffrey House.

The Queanbeyan conference was very well supported by our sponsors. In addition to the considerable financial assistance they provided brochures containing a wealth of information on farm practices including fertiliser advice, suggested pasture seed mixtures and pasture management. As well as good support from commercial companies, producer-financed organisations such as Australian Wool Innovation, Meat and Livestock Australia and the Grains Research and Development Association gave out many well prepared pamphlets with helpful advice to producers on issues from handling salinity to pasture establishment and management.

The next International Grassland Congress will be held in Beijing, China in June/July 2008. There is a probability that the 2012 International Congress will be held in Southern Australia. Details on this topic can be obtained from Professor David Kemp, Faculty of Agriculture, Sydney University, Orange Campus.

It is with sadness that I heard of the death of Dr Alf Anderson, an old colleague of mine, just recently. His discovery of the necessity for Molybdenum and the role of sulphur in pasture plant nutrition made possible dramatic improvement of legume based pastures in very large areas of previously unproductive land. Our sympathy is extended to his family.

***Haydn Lloyd Davies***  
***Editor***

## **Use of low rates of flupropanate for serrated tussock control**

*M. H. Campbell, NSW Department of Primary Industries, (Retired)*

A paper presented at the 2006 Grassland Society of NSW Conference (Nicholls 2006) reported that flupropanate killed serrated tussock on a property near Gunning NSW but it also killed associated useful species.

The flupropanate was applied to serrated tussock growing on infertile soil derived from slate and shale at a recommended rate of 2 L/ha of product (75% a.i.).

It has been known for many years that rates lower than 2 L/ha will kill serrated tussock on infertile soils and cause less damage to associated useful species..

For example, the 2 L/ha rate needed to kill serrated tussock on fertile basalt soils was deemed too high for killing serrated tussock on less fertile soils derived from granite, slate or shale; here 1 to 2 L/ha have proven effective (Campbell 1983, 1995).

The distribution of information on low rates is restricted and that is why producers new to serrated tussock use high rates recommended on the label and elsewhere.

In the supplement to the NSW Department of Primary Industries Agfact of 1995 (Campbell 1995) information on the use of low rates was presented. However, later Agfacts did not have supplements that discussed the rates of herbicide to use on soils of varying fertility. Thus information on low rates is difficult to access.

Low rates of flupropanate can be used under the authority of Permits. For example, rates from 1.0 to 2.0 L/ha were used on the Monaro under the provision of a Permit and rates from 1.5 to 2.0 L/ha can be used under Permit 9198 at present.

The above information is now available in the Third Edition of the Environmental and Noxious Weed Control Handbook from NSW Department of Primary Industries.

In general, applying rates of flupropanate lower than 2 L/ha is permissible without a Permit but they are not covered by the manufacturer's warranty.

The effective low rate to apply on a particular property needs to be determined by trial and error by the producer to ensure a reliable kill.

Flupropanate is more effective at low rates when applied in spring or summer than when applied in winter.

As has been emphasised for many years, the use of herbicides for killing serrated tussock should go hand in hand with pasture improvement/management (Campbell 1962).

This can be done by sowing improved pasture species after spraying or by selectively removing serrated tussock from improved or native pastures.

Serrated tussock can be selectively removed from phalaris, cocksfoot or fescue pastures with flupropanate (Campbell 1979, 1997). It can also be removed from pastures containing sub clover by applying it in late spring, however, it will severely damage the clover if applied in autumn or winter.

Serrated tussock can be selectively removed from red grass (*Bothriochloa macra*), kangaroo grass (*Themeda australis*) or Poa tussock pastures by using flupropanate. For example, a 40 ha hillside on the Abercrombie River aerially sprayed with 1.75 L/ha flupropanate in 1995 reduced the serrated tussock ground cover from 75% to 8% by 2004. Over the same period the ground cover of red grass increased from 10% to 65%.

This hillside was grazed lightly with sheep but no spot spraying was undertaken and no superphosphate or subterranean clover applied. Had the latter been done production would have been increased and control of serrated tussock enhanced.

Some native grasses are killed by flupropanate even at low rates, the most important being Wallaby grass (*Austrodanthonia* spp.) and Weeping grass (*Microlaena stipoides*).

Flupropanate will kill useful species if it is applied at very high rates. The danger is greatest when spot spraying because, given the same mixture of herbicide to water, some sprayers spray tussocks quickly while others spray slowly. Tests on the southern tablelands of NSW revealed that rates of flupropanate varied from 1 to 17 L/ha depending on the spraying speed of the operator.

Naturally, when extremely high rates are applied almost all plants are killed.

In some cases, operators add extra herbicide above the recommended rate to ensure a kill. This is not necessary with flupropanate.

**Conclusion:** More information should be made available to producers on the use of low rates of flupropanate so its selectivity can be maximised.

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## **Tropical grasses produce feed in difficult conditions**

*Sean Murphy, Tamworth*

With the ability to use water efficiently to provide increased feed as well as controlling recharge, tropical grasses are almost certain to play an increased role in grazing systems.

Now, research near Tamworth shows they can also outperform other forage crops, especially in difficult conditions.

NSW Department of Primary Industries (DPI) is comparing water use and forage production for tropical grasses and forage sorghum in a project funded by the Cooperative Research Centre for Plant Based Management of Dry Land Salinity.

Despite an extremely dry start to the 2006-07 summer, good falls occurred in late February and early March lifting the total to 364 mm over the eight month growing period compared to the long term average of 479 mm.

The tropical grasses showed an excellent growth response, with Premier digit grass producing 16.1 t/ha of dry matter, Katambora Rhodes 11.4 t/ha, and Swann forest bluegrass 6.8 t/ha.

Forage sorghum produced 12.89 t/ha.

The tropical grasses had started to grow by late September and by early December growth rates were as high as 140 kg DM/ha per day for the Premier digit.

Forage sorghum achieved just 18 kg DM/ha per day in early December but at that time it was still too young to graze.

Expressed as dry matter, Premier digit produced 50 per cent more forage than sorghum for the season.

With a rooting depth of 1.3 m, Premier digit took 175mm of water out of the soil and had a water use efficiency of 32kg of dry matter per mm of soil moisture and rainfall.

During drier parts of the season, Premier tended to wilt and become dormant rather than continue chasing moisture, while Katambora chased every drop of moisture it could get.

That's reflected in data which shows Katambora extracted 213 mm from the soil with a rooting depth of 1.7 m, but it only produced 22.7kg of dry matter per mm of water.

Katambora took longer to respond to the late season rain because it had completely dried out the soil profile.

Meanwhile, Swann had a root depth of 1.2m, extracted 139mm of water, and produced 13.7kg/mm of water.

Lucerne was also grown in the trial and it produced 11.6t/ha of dry matter with a water efficiency of 23.3kg of dry matter per mm of moisture.

While lucerne produced quality forage, the level of ground cover has only once exceeded 75 per cent, the threshold above which soil erosion is minimized.

The tropical grasses, however, all have maintained groundcover levels above 80 per cent, substantially reducing the risk of soil erosion.

In addition, they can produce large quantities of forage, at very efficient rates, which can be used at the time of growth or later in the season in the form of bulk to fill the autumn feed gap.

Contact: Sean Murphy, Tamworth, 6763 1244  
Lester McCormick, Manilla, 6785 1790

### Summary of the best performers

Rooting depth	1.7m, Katambora Rhodes grass
Soil drying	213 mm, Katambora Rhodes grass
Ground cover	100%, Katambora Rhodes grass
Peak growth rate	140 kg DM/ha/day, Premier digit grass
Herbage produced	16,000 kg DM/ha for season, Premier digit grass
Water use efficiency	32 kg DM/ha/mm Premier digit grass



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## **Biserrula, hard seeded sub clover, drought survivors**

*Bob Freebairn (agricultural consultant, (0428 752 149);  
robert.freebairn@bigpond.com)*

Biserrula (an annual legume), sub clovers and serradella varieties with high levels of hard seed are two clear messages to come from observing the annual component of pastures recovering from the drought. Having a range of maturities within the variety mix, especially for sub clover appears also to be important.

Some areas experienced an autumn break in early March 2007 only to be followed by nine weeks of mainly dry weather before rain fell in mid May. Commonly such an event is referred to as a false autumn break and most of the germinating clover dies.

An example with good comparative data is illustrated in a DPI pasture species trial sown three seasons ago on Michael and Kate Davies property "Box Ridge" Ulamambri (near Binnaway). The soil type is a lighter loam a bit too acidic for long term lucerne but great for tropicals like digit grass combined with annual legumes.

Thirty three varieties of various species were sown in the trial. Regeneration after the drought has varied from failure to some varieties providing dense productive stands.

Biserrula (varieties Casbah and Mauro) has been impressive in the trial and across the Davies property. Biserrula has been documented as rooting down faster than most other annual legumes therefore often equipping it to survive longer when a dry spell follows an early autumn break.

Such was the case this year on "Box Ridge" where biserrula survived the prolonged dry and warmer than normal autumn spell and then quickly responded to the May rain. In contrast most of the other annual clovers suffered high mortality rates and had to regerminate from the soil seed reserve.

Biserrula is an unusual annual legume but generally well adapted to a range of medium and lighter textured soils, as well as tolerant of soil acidity. Seed is not all that expensive, and being small 0.5-1.0 kg/ha is commonly worth adding to a pasture.

It is nutritious. Rarely when biserrula is almost totally dominant of the available feed it has caused photosensitisation in sheep. Hard seed levels are very high (hence long term persistence in suitable environments). It is more tolerant to aphids than sub clover but less tolerant than serradella. A major drawback can be tolerance to only a very few broadleaf herbicides.

High hard seed levels of sub clovers has been a very important feature of varieties recovering after the drought, especially when false breaks have added to the run down of seed reserves. "Box Ridge" is normally regarded as a mid season sub clover area with varieties like Coolamon, York and Riverina doing well. Because of the run of dry springs the early maturing hard seeded variety Dalkeith has been impressive and varieties like it are worth including in a mixture even in a mid season area.

Serradella establishment speed is documented as between that of biserrula and sub clover. While survival of seedlings from the early autumn break on "Box Ridge" was not as good as biserrula its ability to hang on and its high hard seed levels have resulted in varieties like King and Santorini providing good density and well worth including in pasture mixtures for such soils and environments.



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### **White clover breeding for Australia**

*John Ayres & Leah Lane (Glen Innes 'Centre for Perennial Grazing Systems', NSW Department of Primary Industries), Zulfi Jahufer & Derek Woodfield (Grasslands Research Centre, AgResearch Ltd, Palmerston North, New Zealand) & Bob Murison (Department of Mathematics, Statistics and Computing, University of New England)*

New South Wales DPI's Glen Innes 'Centre for Perennial Grazing Systems' is the national base for white clover breeding for dryland environments in Australia.

In 1987, the National White Clover Improvement Program commenced at Glen Innes with the establishment of a White Clover Germplasm Centre comprising a world sourced germplasm collection, seeds laboratory and glasshouse/nursery complex. The original program was funded by the Meat Research Corporation (now MLA), the Australian Wool Corporation (now AWI) and the Dairy Research and Development Corporation.

NSW DPI, AgResearch (NZ), Grasslanz/Agricom and Meat and Livestock Australia (MLA) now have an Alliance directed at the development of white clover varieties for Australia. Currently, the breeders are New South Wales DPI and AgResearch, the co-funders are Grasslanz and MLA, and the commercial partner is Agricom (a NZ company) recently amalgamated into PGG-Wrightsons. Breeding in conjunction with AgResearch and with industry and commerce support commenced from 1994.

The broad aim of the national program has been to develop white clover cultivars that are reliable and provide stable legume-based pastures for improved productivity and sustainability of the pasture resource. Based on a 'blueprint' developed at an Australian Wool Corporation funded national workshop in 1987, the program set out to develop 3 dryland variety types:

- A broad adaptation variety for the heartland white clover zone (850 - 1,000 mm AAR)
- A variety with tolerance of summer-moisture stress to improve year-to-year reliability of herbage yield performance and to improve clover persistence
- A 'dry margins' variety to expand the potential zone of adaptation of white clover into the 700 – 850 mm AAR zone.

The breeding strategy used by the Alliance is based on (i) identifying and selecting superior genotypes, (ii) crossing elite selections and (iii) progeny testing derived breeding lines for the expression of key agronomic and grazing value traits. The primary selection criteria are early vigour, herbage yield and persistence. Parental selection is also applied for seed yield capability, uniformity of leaf size, uniform flowering pattern and freedom from disease and virus symptoms.

The following sequence of activities typically applies in each breeding project:

1. Evaluation in mixed sward culture and under grazing of candidate germplasm accessions in target environments for early vigour, seasonal growth and persistence to select parental material ... (3 years)
2. Crossing of selected genotypes from within best performing germplasm accessions with adapted and productive cultivars to produce breeding lines within leaf size and maturity groups ... (1-2 years)
3. Progeny testing breeding lines across target environments for seasonal growth and persistence, flowering prolificacy, leaf and stolon morphology and HCN concentration to identify elite lines ... (3-4 years)

4. Screening for seed yield capability and pest/disease tolerance to nominate experimental varieties ... (1-2 years)
5. PBR examination, seed increase and commercialisation ... (4 years)
6. Agronomic merit is determined provisionally during progeny testing and is verified through merit testing in target environments in Australia and through national merit list schemes that operate in target markets internationally.

Breeding projects are undertaken as publishable experiments to ensure that NSW DPI pasture breeding work is undertaken with rigour and achieves an enhanced knowledge base as well as new varieties. To date, the white clover improvement program has produced a total of 113 published documents (including 48 scientific papers). This has achieved the following 'value adding' outcomes:

- Breeding decisions are based on sound science and high integrity data
- Robust agronomic results are accumulated through the course of the breeding cycle
- Cultivar description papers and technology packages are developed with timeliness to accompany cultivar release.

Funding for breeding projects has been almost continuous from the early 1990's through the following projects:

1. *DAN 104 White Clover Improvement - National Field Testing of the Australian White Clover Collection (Ayres JF, Norton MR, Jahufer MZZ, FitzGerald RD, 1991/92 - 1994/95, Wool Research & Development Corporation, Agricultural Research & Advisory Station, Glen Innes, NSW)*
2. *DAN 085 National Temperate Perennial Legume Improvement Program - white clover breeding for dryland sheep and cattle pastures (Ayres JF, Caradus JR, 1994/95 - 1996/97, Meat Research Corporation, Glen Innes Agricultural Research & Advisory Station)*
3. *Growth and development of white clover (Trifolium repens) under moisture stress (Jacobs BC, Ayres JF 1995/96 - 1996/97, University of Sydney Research Grants Scheme)*
4. *Reselection within Siral - a white clover cultivar with broad adaptation to NSW dryland environments (Ayres JF, Caradus JR, 1995/96 - 1997/98, Agricom Commercial Funds)*
5. *National Temperate Perennial Legume Improvement Program - white clover breeding for dryland sheep and cattle pastures (JF Ayres & JR Caradus, 1994/95 - 1996/97, Meat Research Corporation)*

6. *Australasian Perennial Legume Improvement Program - white clover breeding for dryland pastures* (JF Ayres & JR Caradus, 1997/98 - 2000/2001, Meat and Livestock Australia)
7. *Drought tolerant white clover cultivar for the dry margins* (JF Ayres, DR Woodfield & MHH Jahufer, 2005-2008, Meat and Livestock Australia & Agricom (New Zealand) Limited).

Three new white clover varieties have been developed by the White Clover Alliance:

- ➔ A broad adaptation variety (Grasslands NuSiral) was released in 1999
- ➔ A variety with tolerance of summer moisture stress (Grasslands Trophy) is proceeding through commercialisation for release from around 2010
- ➔ A new breeding project 'Drought tolerant white clover cultivar for the dry margins' (project 7 above) is presently underway. This current breeding project is expected to be completed by 2009 and will be followed by cultivar development activities including PBR, merit testing and seed production that are essential precursor activities before cultivar release.

Further reading on the breeding work of the White Clover Alliance:

Ayres JF, Caradus JR, Lane LA, Murison RD (1996) White clover breeding for dryland sheep and cattle pastures in Australia. In 'White clover: New Zealand's competitive edge'. (Ed. DR Woodfield) pp 155-158 (Agronomy Society of New Zealand: Christchurch).

Lane LA, Ayres JF, Lovett JV (1997) A review of the introduction and use of white clover (*Trifolium repens* L.) in Australia - significance for breeding objectives. *Australian Journal of Experimental Agriculture* **37** (8), 831 – 839.

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Jahufer MZZ, Cooper M, Ayres JF, Bray RA (2002) Identification of research to improve the efficiency of conventional breeding strategies for white clover in Australia. *Australian Journal of Agricultural Research*, **53**, 239-257.

- Woodfield DR, Caradus JR, Widdup KH, Ayres JF, Bouton I (2002) Global breeding and marketing of white clover. 'Plant Breeding for the 12<sup>th</sup> Millennium' JA McComb (Ed.) Proceedings of the Twelfth Australasian Plant Breeding Conference, 15-20 September 2002 (Australasian Plant Breeding Assoc Inc: Perth Western Australia).
- Ayres JF, Lane LA, Caradus JR (2002) Grasslands NuSiral – a new white clover (*Trifolium repens*. L.) cultivar for drylands pastures. *Australian Journal of Experimental Agriculture* **42**, 1023-1025.
- Murison RD, Ayres JF, Lane LA, Woodfield DR (2006) Statistical methods to address spatial variation in pasture evaluation trials. In 'Advances in Pasture Plant Breeding' - Papers from the Thirteenth Australasian Plant Breeding Conference, 18-21 April 2006, Christchurch, New Zealand (Ed. CF Mercer) pp 49-53. (New Zealand Grassland Association: Dunedin, New Zealand).
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## **An Economic Comparison of Sheep Grazing Systems on the Northern Tablelands of NSW**

*Fiona Scott*

The Cicerone Project group was set-up as a producer-led “research and adoption” group in 1998. The projects undertaken by the group were chosen based on the results of a survey of 350 Northern Tablelands farmers commissioned by the Cicerone Committee in 1997. The three Cicerone Project ‘farmlets’, each 54 hectares in area, were established in 2000 near Uralla, NSW to investigate issues relating to dry seasons, fertiliser use, pasture composition and pasture persistence and to examine the influence of different pasture management techniques at a reasonable scale.

Farmlet A had high inputs of sown pastures and fertilisers and used flexible rotational grazing in an eight paddock system. The soil fertility target for Farmlet A was to reach soil phosphorus and sulfur levels of 60 and 10 ppm respectively. The fertiliser types used and rates applied varied with soil fertility in each paddock and the pasture type being sown. Fertilisers used included single and triple superphosphate, SF25, Granulock 15 and urea.

The fertility targets for both Farmlets B and C were to reach soil phosphorus and sulfur levels of 20 and 6.5 ppm respectively. A range of fertilisers (mainly superphosphate and blends) was used to achieve these targets. Farmlet B (the 'control' treatment - representing typical district practice) therefore received moderate fertiliser inputs but had a similar grazing pattern and number of paddocks to Farmlet A. Farmlet C has also received moderate fertiliser inputs but was managed with an intensive rotational grazing system over its 33 small paddocks.

In this study, a representative farm approach was used to interpret the economic results from the Cicerone farmlets trial from July 2000 to June 2005 at a commercial farm scale. Different budgeting techniques were used to obtain a comprehensive understanding of profitability and the main factors influencing the outcomes. Activity gross margins at both the farmlet and representative commercial scale were produced along with whole farm and cash flow analyses. Sensitivity analysis was used to assess the effect of using average livestock purchase and sale prices on the commercial scale outcomes. Stochastic simulation was also used to assess the range of likely results for Farms A and B over a 20-year period under different scenarios.

At both the farmlet and commercial scales, Farmlet A had the highest gross margin returns, followed by Farmlet B and then Farmlet C. However, at the commercial scale, Farm A had the lowest whole farm returns over the analysis period due to high capital costs of pasture improvement and high supplementary feed costs. The equity level for Farm A did not reach insolvency level, so a commercial scale enterprise could have kept trading in spite of a large peak overdraft. The commercial scale Farm C had lower business return and cash flow position at the end of June 2005 than Farm B due to lower wool production, higher costs for labour and the capital cost of fencing.

Because the 5-year test period experienced drier-than average rainfall years, and hence growth opportunities in response to management were limited, it is not feasible to draw firm conclusions regarding the long-term profitability of any of

the three systems. Thus, at this stage, it is difficult to recommend a particular system of management to graziers based on these limited results. Nevertheless, it is apparent that budgets at the whole-farm level were more useful than gross margins in determining the profitability of different grazing systems because they include all cost and income aspects.

Measurements of resources such as soils and pastures have shown that, over a longer term, the possibility remains that Farmlet B may experience productivity decline and perhaps encounter resource degradation issues due to its declining pastures. Also, Farmlets A and C may be capable of better capturing the advantages of above average rainfall in the future.



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### **Blayney Grasslands Field Day Tuesday May 1<sup>st</sup> 2007**

With all good intentions earlier this year a Grassland Society Field Day was organised for May 1<sup>st</sup> at Bob Stanbridges' property "Trellawarren" via Blayney, by the Central Tablelands Branch.

Good rain on the 3 days preceding the field day had the organiser's quite nervous thinking that many producers would be planting grazing crops. Would they cancel or hope for the best? However the day turned out to an outstanding success.

Having becoming accustomed to drought Bob explained his management strategies for both livestock and pastures. Running both sheep and cattle he had to decide on how to maintain precious pasture resources into the future, make the decision on whether to use the previous springs lucerne for either hay production or finishing lambs, and the use of pellets to supplement pasture, forage brassica and early sown grazing oats. The grazing oats are an essential component of management on "Trellawarren" but prior planning is needed to ensure early sowing and establishment to provide feed before the cold tablelands winter slows pasture growth.

It was clear from the discussions that it is necessary in difficult times for producers to be able to discuss their strategies and ideas with someone from outside the immediate business operation. Bob had sought advice from a number of professionals including the local district agronomist and sheep and wool



officer. Fellow producers interacted freely during discussions on livestock, pasture, fodder crops and weed management.

Bruce Clements, Technical Specialist Pastures for Central NSW was succinct in providing producers with options to consider when assessing pastures after the drought. The decisions on what to do with the good pastures, and those that are beyond saving are the easy ones. The more difficult situations arise with those that are somewhere in between. The options are to assess what productive species and the percentage of the sward they occupy compared to invasive or less desired species and weeds. The best economic decision may be to leave these for another season and reassess in 2008 when hopefully seasonal conditions have improved.

Chris Blore, a 2nd year Bachelor of Farm Management student at Charles Sturt University, Orange found attending the field day a rewarding experience. Chris said that having a range of both private and public agronomists and producers interacting and discussing the advantages and disadvantages of strategies that Bob had undertaken during the drought, and his post drought strategies, depending on rainfall and seasonal conditions, gave him a better understanding of the complexity of management decisions faced by producers.

The day concluded with an informal presentation from Noel Trevaskis from Beyond Blue on suicide and the importance of rural producers to be looking out for their neighbours and friends who may need help. The talk from Noel certainly emphasised the fact that there are often more important things in life than being seen as the successful business operator, the producer of the most dry-matter or regularly topping the local lamb market.



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## **Report on the 2007 NSW Grasslands Society Conference - Queanbeyan**

*By Jim Scott, Chair, Mixed Farming Systems, University of New England,  
Armidale, NSW, 2351*

*Disclaimer: Any errors of interpretation relating to the papers and conference presentations are mine alone. My own thoughts interspersed between comments on the presentations are indicated by italics.*

The overall theme of the Conference was “Pasture Systems: Managing for a Variable Climate” and hence there was a tight focus of the Conference.

### **Theme 1: Climate and environment**

#### **‘Managing for a variable climate: preparing for climate change’ by Peter Hayman, SARDI, Adelaide, SA**

Peter clearly described the differences between climate variability and climate change. Interestingly, the pattern of dry years has been seen before but recently we have been witnessing less wet years to compensate for the dry years.

He outlined a challenging framework including confidence and uncertainty. We are now apparently being challenged by ‘cascading uncertainty’! But we have managed more variable climates than most. We need **tactical** (and I would suggest) **timely** information to help us manage climate risk (and capture the odd opportunity).

The impacts on grazing properties are likely to include pasture species and their persistence, pasture yield and animal performance. There may also be some surprises in terms of pests, weeds and diseases.

*The problem though for us - as our governments influence so much of what advisory services farmers are supplied with - was typified in the recent Great Global Warming Swindle debate on ABC TV with Tony Jones. When the government is run mostly by lawyers (who feel that it is legitimate and indeed necessary to argue equally for the prosecution and defence - a full 180° perspective) and information is filtered and transformed by journalists (who rate below used car salesmen as trustworthy) and the media barons, it is little wonder that we are confused. The planet does care about fundamental trivia like greenhouse gases and energy balances, even if short-term, ‘laissez faire’ (free market) governments do not!*

As he said convincingly - we need to reduce, adapt and innovate - *but one wonders if Australia is really serious about this yet!*

**‘Managing the carbon cycle’ by Jeff Baldock, CSIRO Land & Water**

We were reminded of the ‘challenges of accumulating carbon in our soils in this very clear presentation. *Whilst we humans - especially in Australia, on a per capita basis - gobble up banks of carbon fixed hundreds of millions of years ago, it is not surprising that we are having trouble coming to terms with ‘carbon positive’ or ‘carbon neutral’ land use systems.* Time scales and trends are vitally important.

He pointed out that caution should be taken in our approach to carbon trading - especially of soil carbon.

**‘Balancing profit with climatic and environmental risks’ by Doug Alcock, NSW DPI, Cooma**

Doug’s modelling paper provides us with a glimpse of what a 100 year long experiment might yield. He wisely points out that the downside risk tends to be greater than the upside risk.

*The shape of the supplementary feeding curves provides real cause for concern in the worst 10 percent of years - we have to be prepared to cope with such years - without destroying the natural resources through loss of cover and excessive costs. And we need these analyses to be provided in a timely way.*

We have to integrate profit, production and environment in our decisions. He mentions ‘pushing’ grazing systems closer to the limits whilst maintaining a balance. Indeed we will need fine-tuned tactical and strategic management to achieve this. The risk of over-utilisation of the resource - even at levels of over 50% - is one which must be handled with great care. He suggested that optimum utilisation for Cowra may be 45% whilst at Hamilton, Vic of 56%.

**Invited Poster - ‘Trigger Points’ for stocking decisions in Western NSW by Hacker, Alemseged, Carberry & Smith**

De-stocking and re-stocking - *what a dilemma!*

Yes, we need those Primer decision points prior to a trigger point - *but remember, that no pasture growth is as smooth as Ron, Yohannes, et al. and their colleagues’ paper shows - in any one year, growth is very episodic.*

**Theme 2: Developing and managing pastures for variable climates**

**Paper 1 - ‘Managing and developing plants for variable climates’ by David Kemp, CSU, Orange**

The optimum level of pasture utilisation is an important unknown.

As David correctly points out, better plant genetics is not a ‘magic bullet’. He

points out the real opportunity presented (*but rarely mentioned by others*) of an under-stocked property if and when a wetter season arrives - that it can be a great opportunity for valuable species to be allowed to recover. *That is indeed an opportunity that needs to be better understood - I suggest with cumulative economic calculations over periods of decades - not single year gross margins.*

David presented an interesting figure showing some 12 factors as they change in response to annual herbage growth. *As I will mention later, there are more than 12 factors than graziers need to understand and manage.*

**Paper 2 - 'Achieving production and environmental benefits in a challenging landscape' by John and Robyn Ive, 'Talaheni', Yass, NSW**

John and Robyn Ive have given us a good news story of the benefits of good management over nearly 30 years - based on the most important principle of all - managing the most precious resource - H<sub>2</sub>O. He is using a daily soil water balance model! There has been a BIG impact on tree cover on recharge areas.

Salt: going, going ... (to levels below those of Canberra's drinking water!). The water table has declined at distances of more than 600 m from the plantation.

John pointed out some 20 factors that farmers have to deal with. *Microlaena* appears able to extract more water than phalaris at depth. He has increased his stocking rates in spite of all the tree planting they have carried out. They have been very committed to monitoring across a whole array of factors.

The 12 steps he recommends provide very useful guidance for managing water better across our variable landscapes - using most of the management and monitoring options available to us, including soil, pasture, tree, infrastructure and landscape components.

There is a great challenge in integrating these issues.

**Invited Poster - 'Summer dormancy - a drought resistance strategy in perennial grasses' by Norton, Volaire, Fukai and Lelievre**

Mark Norton et al have reinforced the critical importance of having plants well adapted to surviving in our variable climates - and especially those grasses exhibiting summer dormancy.

**Invited Poster - 'Drought resistance of perennial grasses' by Bolger, Garden and Rivelli**

Terry Bolger and his colleagues have explained how grass physiology can assist in plant survival - *however, two aspects limit the implications of this work.*

*These results need to be explored further under conditions where the depth of*

*rooting can be measured - and the effects of ruminant herbivores can be studied, both for the degree to which selective grazing affects the grasses and also the benefits of the grasses to livestock production.*

**Theme 3: Managing cash flow under adversity**

**Paper 1 - 'July 2007 – Where to from here?' by David Sackett, Holmes, Sackett & Associates, Wagga Wagga**

Those farmers who have not managed drought well have cost us all a great deal in terms of credibility for agriculture - if farmers get assistance, they will have their decisions challenged by non farmers. It is better to use farm management bonds and leave more control in the hands of farmers.

David Sackett has brought us back to a useful 'whole farm' perspective in his talk about drought recovery and how it takes longer to recover than the duration of the drought. The benefits of income diversification are reinforced as is the need to have pastures which last - even if they are not the most productive. The use of Net Present Values of persistent pastures provides a powerful message.

The need to run the overall enterprise well is stressed - hence the critical need for farmers and their advisors to consider multiple factors relating to profitable and sustainable farming.

**Paper 2 - 'Surviving drought: strategies to date and plans for the future' by Ian and Pru Atkinson, 'Gundabooka', Cumnock**

Ian has given us some great insights into the value to him of using tools such as the DPI Feed Cost Calculator, Stockplan and GrazFeed. It is clear that there are no simple answers - a challenge to all of us to come up with better ways of arriving at optimal choices based on multiple factors influencing our decisions.

**Theme 4: Managing on-farm water in a variable climate**

**Paper 1 - 'Managing your farm's water resources' by John Franklin, Murrumbidgee CMA., Yass**

Mention is made of the critical need to secure reliable water supplies for livestock. Whilst this is absolutely essential, *we also need to remember the most crucial need for water for pasture based grazing enterprises - that is, plant available soil water in the root profile.*

**Paper 2 - 'Water reticulation on-farm in a challenging environment' by Bryce Garnock, "South Bukalong", Cooma**

Likewise, Bryce Garnock gives great advice on delivering sufficient water for drinking water for large mobs in his holistic grazing system. *Whilst the need for up to 75 mm of Readily Available Water (RAW) is mentioned, details are not*

*provided on how this system delivers enhanced water levels in the root zone - and yet, this is what is needed.*

**LANDSCAN Farm Plan - a new workshop to assist graziers by Michael Keys, Queanbeyan and Bruce Clements, Bathurst**

Dealing with major land degradation issues such as salinity, acidification and erosion. There is a need for trigger points for production and environmental outcomes. This paper provides great support for learning about the value of soil testing.

**Evaluation of 'Paddock Plants' field days by Lori McWhirter, Helena Warren and Ashley Senn**

Mention is made of farmers needing to know their plants - C3 and C4, fertiliser requirements, water use efficiency, dormancy mechanisms, maintaining ground cover, etc.

**Variability in weather: what are the consequences for grazing enterprises? Libby Salmon and John Donnelly**

The authors use 117 years of climatic data for Yass to compute trends in variability - from 1890 - 2006 using the new version 3 of the GrassGro model.

"Livestock producers in southern Australia have dealt with high levels of variability in the past and should expect to manage similar levels of uncertainty in the future".

*This paper provides a fascinating long-term view beyond the period of relevance for all of the human population! This is the power of models - to get us to look at the long-term. It provides fascinating reading for all those who think we have just had the most severe drought on record! It discusses the options for those wanting to de-stock in drought or re-stock following a break in the drought.*

**Persistence of perennial pastures in variable seasons by Michael Keys**

Persistence of pastures over 7 years at Braidwood - a spectacular demonstration of the potential for excellent persistence - almost to the point of paying for itself! It is clear that persistence is more related to the species rather than the individual cultivars - thus far, persistence over 7 years has been measured for all phalaris cultivars as well as for some cocksfoot and tall fescue cultivars.

**Establishment trials on acid soils with phalaris cultivars varying in aluminium tolerance by Richard Culvenor and Dennis Watson**

The potential for Aluminium Tolerant (AT) selections of phalaris will help that species persist better in challenging soils.

**Grazing behaviour and diet composition of sheep grazing dual-purpose canola by Hugh Dove and Andrew Lieschke**

Some very high digestibilities (88%) providing options for high quality winter feed gaps in mixed farming systems.

**Seed preferences of Pheidole ants for pasture grasses and legumes at 3 sites in southern New South Wales by Walter Kelman**

Negative correlation between seed harvested and seed weight.

**Impact of climate variability on predicted annual pasture intake of sheep grazing native pastures in northern NSW by Greg Lodge and Ian Johnson**

An interesting analysis using the SGS Pasture Model for northern NSW to calculate the risk of meeting the needs of ewes on a range of native and modified pastures. They make interesting comments about the “collective memory” of graziers.

**Developing tools for climate risk management in the subtropical dairy zone by Katrina Sinclair, R.G. Walker and Z. Hochman**

They report the development of a simulation tool (using DairyMod) to help with different categories of SOI indices - as it applies to the north coast region (Kyogle) - helping develop tools which will assist graziers.

**Comments related to the commercial sponsors**

*I enjoyed your displays and your good natured discussion - and your great support of the Conference. May I suggest that it is not only governments that need to focus on long-term solutions. I believe that your agribusinesses really need to focus on long-term solutions. Not only for your clients' businesses but for your businesses.*

**To simplify ...**

*When contemplating the confusing array of factors that farmers have to manage, especially in relation to climate variability, remember what the Sustainable Grazing Systems (SGS) National Experiment (1997-2002) taught us - across the nation:*

*There is a very poor relationship across southern Australia between the total annual rainfall received and the amount of herbage accumulated in grazing enterprises.*

*This experiment found that 84 per cent of the variation in carrying capacity could be explained by variations in just 5 things: soil phosphorus, soil pH, grazing rest*



*periods, the legume percentage and an index of the growing season soil moisture (in a variable climate).*

*That is, the most important strategies in sustainable grazing enterprises are to: soil test and fertilise, manage your grazing for persistence, manage your perennial grass and legume composition and monitor your **variable** but - if you have well nourished, deep-rooted plants, you will have **more** - plant available water.*

## **Thank you**

I thank you for the opportunity to comment on this most stimulating conference.



## **Queanbeyan Conference Bus Trips:**

### **Bus Trip No. 1**

Trip No. 1 went to the CSIRO, Plant Industry research station at Ginninderra. The first site visited was to inspect plots where the response of the winter wheat crop to a range of grazing practises.... Next, the use of canola for grazing and seed production was examined. There was no significant impact of grazing on oil content on any variety of canola. The vegetative component of canola had an organic matter digestibility of >80%. Canola made up to 85% of the material grazed by sheep... Then Rex Culvenor discussed progress in breeding highly productive cultivars of phalaris. Two promising new cultivars were Holdfast G T and Advanced A T. Richard Simpson discussed the important topic of phosphorus nutrition of pastures including its relevance to root health. Finally, Hugh Dove discussed some exciting new animal production responses to sodium and magnesium in hoggets grazing winter wheats. Further details on these interesting studies may be obtained from Dr. Hugh Dove at the Division of plant Industry, CSIRO, Canberra.

### **Bus Trip No. 2**

The other bus tour was to the Bingley family property “Weerona”, 5 km south of Sutton NSW. We started at the Weerona woolshed with Chris Houghton welcoming us and outlining the objectives at the Sutton Pasture Technology site. He was followed by Andrew Harborne who discussed winter growth with a nitrogenous fertiliser “Easy N”. The following speaker was Dean Baker who discussed recent developments in pasture species. The final speaker in the woolshed was Charles McClintock who discussed boosting winter growth with a plant growth regulator (used in horticulture) – ProGibbSG. Going outside we saw an ATV Pasture Meter, certainly easier than cutting quadrats with sheep shears! We then went on a farm walk looking at a variety of pastures and winterfeed. We looked at forage brassica, brome grass, a fescue-based pasture, a phalaris /subterranean clove pasture and finally (with most growth) an area of Crusader Ryegrass.



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### **ATTENTION MEMBERS:**

**Have you had a look at the Grassland Website lately**  
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## **From the President's desk**

At the time of writing this brief note for our newsletter, widespread rain in northern NSW was falling. Unfortunately, rain was quite patchy in southern districts and is needed before the end of August to revive cereal and oil seed crops.

Rain in the north will improve the winter crop prospects as well as laying a foundation for spring pasture growth.

Our 2007 conference at Queanbeyan has come and gone and as usual was of a high standard. It embraced a good balance of climate and natural resource management with excellent up dates on pasture technology from presented and poster papers. Once again, the mix of producer and technologist presentations provided a wealth of information for all those who attended. The conference proceedings will serve as a valuable reference for years to come.

Congratulations to the convenors, Col Langford and Doug Alcock and their committee for putting together a stimulating conference, informative bus tours, and great conference dinner. They even managed to keep the forecast snow showers away for the outdoor segments.

Many thanks again to our valued sponsors from the seed, fertilizer, and ag chemical companies as well as the Land, Australian Farm Journal, AWI , MLA, Land and Water Australia and NSW DPI. The assistance we receive from our sponsors is highly appreciated and we look forward to continuing this association. Next year, the conference will go to Tamworth. Already, there are preliminary plans to feature both tropical and temperate pastures at the conference. Tropical grasses are steadily attracting plenty of attention in the slopes of northern NSW and the central west. Members will remember the very successful 2004 conference held in Gunnedah where tropical pastures created a lot of interest. Next year's conference will enable those who attend to obtain an update on tropical grass developments as well as new and promising legumes for tableland and slopes locations.

Best wishes to all members and with high hopes for an improved spring.

*Mick Duncan*



***THE GRASSLAND SOCIETY OF NSW INC.***  
**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 approx. 500 members and associates, 75% of whom are farmers and graziers. The balance are agricultural scientists, farm advisers, consultants, and 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.

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