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NEWSLETTER

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Among my recent mail I received a publication of general interest to our members. It was "Focus on Perennials" obtainable from "Future Farm Industries C.R.C. The University of W.A, 35 Stirling Highway, Crawley W.A. 6009. In it there are articles by our member Dr John Ayres on Birdsfoot Trefoil and another of our members Carol Harris on "Unlocking the Potential of Perennial Pastures" where she emphasises the potential of Cocksfoot and Tall Fescue. In the same publication there is an interesting article on "Saltland-what is it capable of."

The feedback I have been getting is that many of our members have recently received effective rain and several have ceased supplementary feeding. It is too soon to state that the drought is over but we can be optimistic.

If members are contemplating overseas visits in 2008 there will be a choice of Grassland Conferences. There will be the International Grassland Conference in Hohhot, China from 29 June to 5 July (see Newsletter Issue No. 4, 2007). On 9-12 June the European Grassland Federation will be holding its conference in Uppsala, Sweden. On 14-16 July the British Grassland Society will be holding its summer meeting in Holland – see www.britishgrassland.com .

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Returns for 2008 have started very well with increases in prices for wool (>10$ a kilogram) and good prices for lambs and young cattle. We all hope for a return to a "normal" autumn break so that there will be abundant pasture for winter.

A topic which has had considerable media coverage lately is the growing of crops for biofuels. The 2007 ATSE Crawford Fund conference was on "Biofuels, Energy and Agriculture: powering towards or away from Food Security?" An outstanding summary of this conference is available from – The ATSE Crawford Fund, 1 Leonard Street Parkville, Victoria 3052.

A book that will interest all our members is Dr Ted Henzell's "Australian Agriculture: Its History and Challenges" Published by CSIRO publishing. Dr Henzell is an internationally renowned agricultural research scientist. He argues that Australia's success has been due to the smart use of science and technology.

Haydn Lloyd Davies
Editor

Grasslands Conference returns to Tamworth for 2008

The northwest branch of the grassland society has been pleased to accept the challenge of holding the annual conference in Tamworth in 2008. The conference will be the first the northwest branch has held since the highly successful conference in Gunnedah in 2004.

The conference convenor and District Agronomist, Tamworth, NSW Department of Primary Industries Loretta Serafin, commented that "We have begun to plan for the conference by setting up an enthusiastic organising committee which has a good representative of growers, advisors and researchers supported by key companies and representatives from local government departments."

The committee has set the dates of July 22, 23 and 24, 2008 for the conference with a mixed program of informative talks and field tours expected.

"While the planning is still in the early stages, the committee is keen to have growers provide most of the input into items for the conference agenda. As such the next meeting will include a host of invited local growers to give them the opportunity to say what they would like to hear on the program."

"Tamworth will provide a large regional centre with excellent facilities for a conference of this size and there is a lot of scope for interesting field tours which encompass the tablelands, slopes and plains all within close proximity"

The committee expects interest to be high and will have additional details available early in the new year.

Early maturity, hard seed; best drought pasture annuals

Bob Freebairn, agricultural consultant, (0428752 149);
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For the second consecutive year, and for many areas the third time in four years (even in normally more reliable rainfall areas), an extremely dry spring was experienced.

Whether it is because of climate change, or the normal ups and downs of seasonal variability, the conclusion is the same. To ensure annual legumes are an

effective part of the pasture mix more emphasis is commonly required on varieties that set seed under harsh conditions and as well set good levels of hard seed to ensure viable seed is left over should seed set not occur in a run of tough years.

Fortunately research for many years has sought such varieties. The practical implications more often than not are to include varieties normally considered suited to drier areas than a given farm and to include species not previously considered suitable for that area.

Many areas I work in are typical 600mm per annum average rainfall areas. These include the northern and central NSW slopes and tablelands, often these have moderate to slight summer dominant rainfall patterns. Mid season sub clover varieties like Junee, York, Seaton Park LF, Riverina and Coolamon have traditionally been the mainstream annual legume varieties for the pasture mix (which desirably also include temperate or subtropical grasses or lucerne).

However earlier maturing Dalkeith, commonly more regarded as a lower rainfall sub clover, has been the standout variety over the last few years. Because it flowers earlier it has set a lot more seed in the drier springs than the mid season varieties and extra seed has resulted in far denser winter pastures with consequent superior winter early spring production. Dalkeith also rates very high for hard seed levels.

If a return to better seasons occurs Dalkeith does not have the capacity to capitalise on good spring as do mid season types. The prudent strategy is to include both early and mid season varieties in these areas. Drier areas would go for even earlier maturing lines like Nungarin as part of the mix. Areas normally regarded as high rainfall and dependent on long season varieties would benefit from the inclusion of earlier mid season ones. For permanent pastures consider drilling or broadcasting them in.

Biserrula has been a standout annual legume in many areas during these past few seasons. It has the ability to root down further and faster than sub clover and has commonly been able to last out a long dry period following an early autumn break better than sub clover. It has also commonly lasted well beyond sub clover into the spring growing more feed and setting more seed.

Biserrula (variety Casbah tends to best suit mid season and drier areas and Mauro is a longer season variety) also has high levels of hard seed. While originally tested as a light soil species I have also seen good stands on heavy soils as far a-field as Trangie and Tamworth. Again the suggestion is to include biserrula as part of a pasture mix.

Serradella has also hung on well in many lighter soil paddocks and tends to be able to keep flowering and seeding longer than sub clover. It is an aerial seeder and requires more care with grazing over the flowering seed set period to ensure adequate seeding. Unlike sub clover earlier flowering varieties keep growing if the spring is good.

New Zealand Pasture Industry Study Tour

Mick Duncan, Agronomist for Northern Agriculture, Armidale

Late last year, I undertook a most interesting one week trip to the Christchurch and Canterbury Plains areas of the south island of New Zealand (NZ). The purpose of the trip was to look at developments in pasture and forage plant research and in particular, to assess the relevance of NZ work to the pasture areas of NSW.

As most Grassland Society members will be aware, pasture and forage crop research in NZ has, for many years, provided broadly adapted varieties commonly used in Australia. These are a valuable complement to our "home grown" pasture varieties. Further, the many liaisons and partnerships formed between NZ and Australian workers have been of immense value to our grazing industries.

Perennial and short term ryegrass research continues to produce highly productive varieties, many of which would be expected to perform well in appropriate localities in NSW. Some new perennial ryegrasses with late maturity, including Ceres One50, have the capacity to provide high quality feed, later into the spring than earlier maturing varieties, provided spring rainfall or irrigation is present. Such varieties would be of particular interest to livestock producers in the higher, more reliable rainfall districts. Several new ryegrasses I saw in trials, are at least 4 weeks later to head than most commonly used NSW varieties. These would be well worth trying at suitable locations in NSW.

There is also plenty of activity with temperate and Mediterranean tall fescues. The summer active temperate types, like Demeter and Au Triumph have been sown, traditionally and very successfully in summer dominant rainfall areas such as the Northern Tablelands of NSW. The more recently introduced Mediterranean types, such as Flecha, Fraydo, Resolute and Prosper are expected to extend the more traditional fescue zones to central and southern NSW where summer rainfall is minimal. The summer dormancy of this group, as demonstrated in current trials in the Central Slopes of NSW, is enabling these varieties to survive better than the

summer active, temperate types. NZ research has several Mediterranean and temperate types in the “pipe line”, which will be evaluated in NSW over the next couple of years. Evaluation of these lines will complement NSW tall fescue research undertaken at various locations in northern NSW.

The inclusion of endophyte in perennial ryegrass and tall fescue is also the subject of research and evaluation in NZ. Endophyte is a fungus that lives between the cells of many grasses. Some occur naturally, so called “wild” types. These are known to improve aspects of plant growth but sometimes at the expense of animal health. Others have been selected to improve plant performance, with minimal or nil risk to animal health. These are referred to as “select” or “novel” endophytes. Many of the older cultivars of perennial ryegrass used in NSW contain wild endophyte, which produces a range of alkaloids, some of which can cause animal health disorders such as ryegrass staggers. While this is not a regular or common problem, it has the potential, in ryegrass dominant pastures to cause significant animal health disorders. Other specific alkaloids have an insect deterrent affect, thus improving general plant growth. By contrast, most of the older cultivars of tall fescue, such as Demeter and Au Triumph do not contain wild endophyte, while most turf types do. More recently, tall fescues with the suffix “Max P”, denoting the presence of select (safe) endophyte, have been made available.

Although there has been much research in NZ, the role of endophyte in Australia is yet to be comprehensively understood. Ryegrass benefits in the presence of endophyte have been documented in the south coast of NSW and nearby tablelands, where African black beetle is known to thin out nil endophyte ryegrass within two years of sowing. Elsewhere, trial work using tall fescue with and without endophyte, has been less conclusive, with some conflicting results that need further evaluation.

Forage brassicas such as Winfred and Hunter as well as the herbs, plantain and chicory are also receiving attention from NZ plant breeders and animal nutritionists. These forages are capable of producing high quality material and subsequent animal production. They fit well into most tablelands farm programs from either a spring or autumn sowing and have the added benefit of providing a disease and weed break away from traditional cereals. In NZ, Winfred and chicory have been sown together, with very good results, provided grazing management and sub divisional fencing keep crops in the leafy vegetative stage. Mature, stemmy material loses quality very quickly with a similar decline in animal growth rates. Forage brassicas have performed very well in recent years in the higher, more reliable rainfall areas of the NSW tablelands.

The pasture and forage seed production industry in the Canterbury region is impressive. NZ cleaned nearly 40,000 t. of crop, amenity and pasture seed in 2006, much of which finds its way onto the export market, including Australia. Not surprisingly, an industry of this size needs to be efficient and responsive to market demands. This is good for the NZ economy, but also for Australian pasture producers.

There are risks in making comparisons between the Canterbury area of NZ (that experiences more consistent rainfall and more favourable soil moisture status for much of the year) and NSW locations. However, very useful principles can be taken and adapted for use in our locations. Likewise, new pasture and crop varieties from "across the ditch" are well worth local evaluation. History tells us that this approach will regularly result in better pastures and improved animal production, provided we make use of good quality, local research and of course our own observations under NSW conditions.

Reducing theft of pasture seeds by seed-harvesting ants

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

A poster paper in the Proceedings of the 2007 Grassland Society of NSW Conference (Kelman 2007) described the seed preferences of *Pheidole* ants at three sites near Canberra ACT.

These results agree with those obtained on the central and northern tablelands and north-western slopes of NSW (Campbell 1966, Campbell and Swain 1973, Campbell and Gilmour 1979, Johns and Greenup 1976) where ants took large numbers of seeds of pasture species sown on the soil surface.

It has been calculated that *Pheidole* ants can take a total aerial sowing, 10 kg of seed/ha, in 16 hours foraging.
Seed removal is greatest if a dry period follows sowing since this increases the time between sowing and germination and *Pheidole* ants prefer ungerminated to germinated seeds.

Pheidole ants have an advantage because there are up to 25 million per hectare compared to five million seeds aerially sown per hectare when establishing introduced pastures.

The amount of seed removed by ants from cultivated seedbeds has not been investigated in Australia but loss of lawn, vegetable and other crop seeds sown near the soil surface is common. In Africa Anslow (1958) observed ants taking seeds of *Setaria sphacelata* from cultivated seedbeds which he countered by treating them with insecticide.

Research in NSW has shown that loss of aerially sown seeds can be reduced by coating them with insecticide (Campbell and Gilmour 1979); insecticide coating reduced removal rates from 150 to five seeds/nest/day over a 14-day period.
This reduced rate of removal results in increased establishment of aerially sown pasture species (Table 1).

Table 1. Effect of insecticide coating of seeds on establishment of aerially-sown pasture species from 10 sowings over two years (Campbell 1966)

Species sown	Number of plants to establish/m²		Sowings improved by insecticide (%)
	- insecticide	+ insecticide	
Cocksfoot	7	41	100
Ryegrass	3	16	70
White clover	11	25	70
Phalaris	1	4	50
Red clover	10	22	40
Sub. Clover	8	13	20

The most effective insecticide for reducing ant predation, with no effects on germination and rhizobia added to legume seeds, was permethrin (Campbell and Gilmour 1979).

Pheidole ants forage in the morning and evening in summer and in midday in winter to avoid temperature extremes.

Because *Pheidole* ants are only 3 mm long they prefer small seeds to large. For example a subterranean clover seed weighs 17 times as much as an ant and thus smaller seeds are preferred but if subterranean clover is the only seed sown the ants will take many.

Phalaris is a preferred seed for *Pheidole* ants because the seeds are easy to carry by the point and the glumes enclosing the true seed are readily removed and discarded outside the nest. Ants extract the true seed from most grass seeds and discard the coverings outside the nest, one way of identifying seed-harvesting

ants. They often pile legume seeds outside the nest where weathering cracks the seed coat facilitating consumption of the contents.

Ants will ignore less preferred seeds that are easy to collect and climb plants to access more desirable seeds.

Pheidole ants seem to be able to communicate because when seeds are first broadcast onto the soil activity is slight but about an hour after the first seeds are taken into the nest frantic activity ensues.

In Russia *Pheidole militicida* uses trail pheromones, visual guidelines and persistent chemical cues to forage. Foraging is carried out by experienced foragers and observers. Trail pheromones laid by workers have a recruitment signal and orientation cue and are species specific. In Finland allegiance to routes is based on individual memory of visual cues that are recalled after winter hibernation.

Thus seed-harvesting ants have sophisticated collection processes that can be interrupted by sowing seeds of introduced pasture species treated with permethrin. As nests recover after this treatment it represents only a temporary setback to their ecological enterprises and results in an increased supply of high quality seeds.

Anslow, R.C. (1958). An improved method of establishing *Setaria spacelata*. Emp. J. Exp. Agric. 26, 55-7.

Campbell, M.H. (1966). Theft by harvesting ants of pasture seed broadcast on unploughed land. Aust. J. Exp. Agric. Anim. Husb. 6, 334-8.

Campbell, M.H. and Gilmour, A.R. (1979). Reducing losses of surface-sown seed due to harvesting ants. Aust. J. Exp. Agric. Anim. Husb. 19, 706-11.

Campbell, M.H. and Swain, F.G. (1973). Factors causing losses during establishment of surface-sown pastures. J. Range Manage. 26, 355-9.

Johns, G.G. and Greenup, L.R. (1976). Pasture seed theft by ants in northern NSW. Aust. J. Exp. Agric. Anim. Husb. 16, 249-56.

Kelman, W. (2007). Seed preferences of *Pheidole* ants for pasture grasses and legumes at 3 sites in southern NSW. Proceedings 22nd Conference NSW Grassland Soc. pp. 68-9.

Boosting winter feed by adding fast growing annuals

Bob Freebairn (0428 752 149); robert.freebairn@bigpond.com)

Boosting winter pastures by autumn drilling of fast growing annuals, especially Italian ryegrass and perhaps cereals and/or forage rape, can be highly reliable as well as profitable.

In trials on his central west Cowra property Elders agronomist Peter Watt recorded greatly improved winter growth from some of the Italian annual ryegrasses (a sub species of *Lolium multiflorum* and distinct from annual Wimmera or *Lolium rigidum* ryegrass) compared to typical annual pastures. Growth rates of some varieties in mid winter were up to 50kg drymatter per ha per day when typical pastures were growing at much less than half that rate.

Peter Watt says many pastures lack winter vigour, especially in years with late breaks. These include those thin on useful species (typical after droughts), thinned lucerne, tropical pastures that stop growing in mid winter (companion annuals may be slow to get away), and even temperate perennials that can be slow to get away after a late break. There also is a big role for either annual ryegrass on its own or as part of a mix sown as a fodder crop in its own right.

Several companies market annual ryegrasses distinct from the Wimmera type and with greatly improved establishment speed and faster winter growth. Some are quick maturing and suit lower rainfall areas, others mid season that tend to best suit medium rainfall areas (eg Adrenalin and Winter Star 11 preformed well at Cowra), and some are longer season more suited to higher rainfall areas more likely to have milder/moister late spring and summers.

The Italian annuals are either diploid or tetraploid types, both with pluses and minuses. Both types don't have herbicide resistance issues (and probably not likely to as they will mainly be part of an annually incorporated option), and no known ryegrass toxicity or ergot problems.

Direct drill sowing with minimal soil disturbance and the ability to sow into existing pastures without ploughing out a perennial base adds to the feasibility of adding more winter active species like the annual Italian ryegrasses. Adding competition and more winter feed to perennial pastures is unlikely to impact on the survival of subtropical species and its impact on lucerne and temperate perennials can be minimised by careful grazing management.

Peter Watt says that research supports earlier sowing (autumn), given that temperature is not too high and that moisture is available. A lost early sowing

opportunity can be the difference between 10 – 12 t/ha and 2 - 4 t/ha drymatter of total additional feed.

Ryegrass sometimes is sown with cereals (oats, winter wheat, barley, and triticale). Advantage of added cereal can include less cost, added fibre (often desirable in lush pastures) and more early feed. Ryegrass adds to total feed (including more late feed) and quality. Peter Watt also believes there is a place for ryegrass plus forage rape or canola (another story).

As a general rule the higher the density, and therefore sowing rate (within reason) the more the feed, especially early winter feed. Tetraploid ryegrasses generally have larger seed than diploids. As a general rule ryegrass sowing rate for medium rainfall areas is 15 – 25 kg/ha.

Soil fertility is critical. When sowing into existing pastures available nitrogen can be low (tied up). Weeds impact on management. It may be better to wait for weed germination before sowing if grass weeds are likely. Don't neglect possible pests like blue oat mites.

New stripe rust pathotype will mean management changes for triticale growers

The detection in October of a new pathotype of the wheat stripe rust pathogen, *Puccinia striiformis* f.sp. *tritici*, designated 134 E16 A+ J+ and referred to as the Jackie pathotype, has caused increased stripe rust damage on several triticale varieties, including the popular dual purpose varieties Jackie and Breakwell. The reaction of the variety Crackerjack to the new pathotype is unknown at this stage. Two new dual purpose releases from the University of Sydney, Tobruk (AT574) and Endeavour (AT528), are resistant to the new pathotype. Seed of these two new varieties, available from Waratah Seeds, may be in limited supply in 2008.

Prior to the occurrence of the WA pathotype in eastern Australia in 2003, triticale varieties were generally highly resistant to stripe rust.

The occurrence of the WA pathotype resulted in a noticeable shift in disease reaction with increased rusting noted on most varieties. The basis for this was virulence in the WA pathotype for *Yr9* which is a common resistance gene in triticales.

The occurrence of the Jackie pathotype in 2007 has caused another shift to increased stripe rust damage for most varieties. This suggests that a single

resistance gene in Jackie and other related varieties has been overcome by the Jackie pathotype in a similar manner to the demise of the *Yr9* resistance. Further research is underway to confirm this possibility.

Although the 2007 National Rust Control survey is currently incomplete, the available data indicates that the Jackie pathotype has been detected over most regions of eastern Australia. It has been recovered principally from triticales but also from several wheat fields. It is expected that the Jackie pathotype will survive the summer period following the good rains across most triticale production areas during November and December.

Stripe rust control options for triticale in 2008 will need to consider the following:

1. Select resistant varieties where ever possible, and avoid the more extreme susceptible types such as Jackie and the grain only varieties Kosciuszko, Muir and Speedee.

2. Take great care in managing early sown dual purpose varieties. The possibility for disease build up on vulnerable early sown varieties is a real and constant danger. When disease occurs early, pathogen inoculum will increase and represent a major threat to main season wheat and triticale varieties.

3. Grazing can be an option to reduce canopy density in dual purpose varieties and so minimise the infection opportunities for the pathogen. However, susceptible varieties such as Jackie can be expected to remain vulnerable, even in situations where the canopy has been significantly reduced.

4. Consider fungicide strategies during planning for the 2008 season. Early sown triticales can be protected with seed and fertilizer applied fungicide. Foliar sprays may also be required and these can in certain circumstances be tank mixed with broad leaf herbicide applications after stock are removed from grazed fields.

However, there are two important issues:
(i) be careful to observe product registration labels. Currently there are no fungicides registered for control of stripe rust in triticale. However, a permit is in force (PERMIT NUMBER – PER8359) for NSW growers to control stripe rust in triticale. Eventually label extensions are expected to be made for the 2008 and subsequent seasons. Consult local advice before application.

(ii) when applying fungicide to fields where grazing is intended, take careful note of withholding periods.

Further information on variety disease reaction, seed and foliar treatments will be available in the NSW DPI Winter Crop Variety Sowing Guide 2008.

For access to Cereal Rust Reports use the following option:

• http://www.agric.usyd.edu.au:8888/pbi/cereal_rust_reports_crr.htm

Acknowledgement: **Plant Breeding Institute Cereal Rust Report Volume 5 Issue 5 December 2007.**

Drought affected canola & wheat – feed quantity and quality decline in standing crops

Nigel Phillips, Technical Specialist Pastures (South), Wagga and Guy McMullen, Research Agronomist, Northern Farming Systems, Tamworth.

Key points

- Baling drought affected crops for hay or silage at flowering will capture the highest quality feed, optimize the cost per MJ and deliver the best animal performance when fed.

- Leaf and head/pod material is significantly higher in feed value than the stem. Grazing a standing crop will allow animals to select a diet higher than the whole crop average and this will be reflected as higher animal performance.

- Leaf and pod loss in canola is more rapid than with wheat. Grazing canola crops first to capture this material may be one strategy to maximize utilization.

- Allow growing livestock to graze crops first while high quality feed is available.

Background

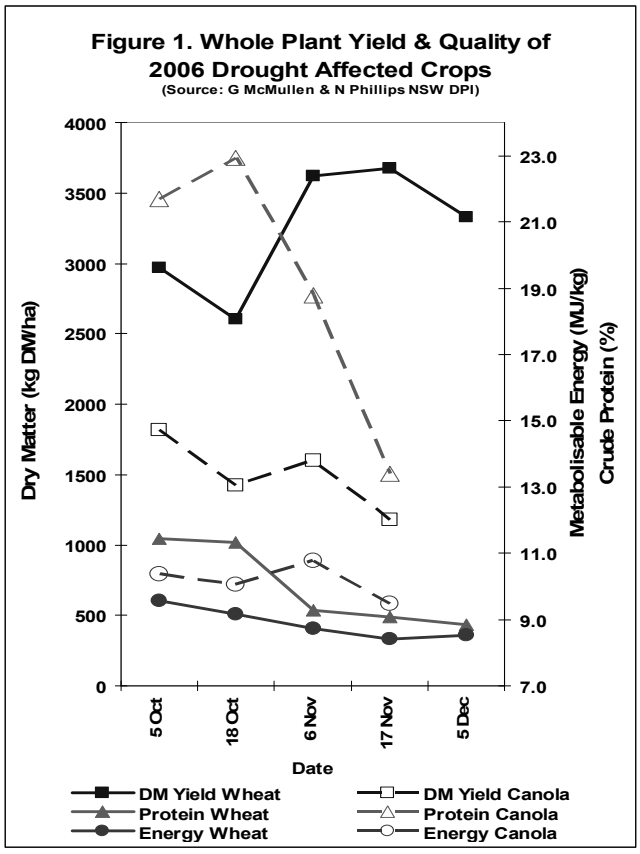
In recent years baling of drought affected canola and wheat crops for silage or hay has often provided the greatest economic return. However, it is not always possible or desirable to bale these crops and in many instances crops are left standing as a feed source for livestock. Standing crops are subjected to environmental conditions which will not affect stored fodder resulting in greater change in both quantity and quality over time. But unlike hay or silage, standing crops may be selectively grazed by animals to deliver a diet higher than the average nutrient value of the crop. Understanding the changes in quantity and quality can assist producers to better manage grazing from these crops.

Trial plots of canola and wheat were left standing at Ganmain and Eurongilly to measure changes in feed quantity and quality from early October to December 2006. Plots were cut to ground level and divided into leaf, stem and head/pod. Each component was tested for feed quality. Rainfall during this period was quite low (Ganmain 38.2mm, Eurongilly 40.6mm) and it can be expected that with

greater rainfall after crop death losses in both quantity and quality would be higher. The results presented here have been averaged over both sites.

Whole crop quantity & quality

Figure 1 shows Dry Matter yield, Metabolisable Energy (ME) and Crude Protein (CP) for canola and wheat. For both crops there is a general decline in ME and CP after flowering with canola showing a small increase in ME during pod fill. At all stages canola exhibits better feed quality than wheat.



Dry matter yields for wheat are greater than canola at all stages. The wheat also produced a substantial increase in yield after flowering as grain formed in the head. This reflects the greater ability of cereals to handle drought conditions compared to canola.

Energy and protein levels are initially quite high, particularly with canola, and experience shows that animal performance on silage or hay made from this material is good. The relative animal performance can be modeled using Grazfeed®. Hay or silage made from cutting the crop on the 5th October are predicted to produce weight gains in a 33 kg lamb of 124grams per day for canola and 82grams per day for wheat. By cutting hay or silage on the 17th November weight gains when fed out would only be 79g/day for canola and 26g/day for the wheat. The take home message is that to maximize animal performance and minimize cost per unit of energy from baled drought affected crops they should be cut early, ideally around flowering.

Plant part quantity & quality

Table 1 shows the changes in plant part quantity and quality for canola. Notably, stem makes up 60% to 80% of available feed. The high nutrient value leaf material retains it energy and protein well over the period compared to wheat (Table 2) but quantity declines rapidly and while the pod quantity and energy values increase during seed fill it represents less than 14% of the available feed.

Table 1.	**Canola**		
Date	**Dry Matter (kg/ha)**		
	Leaf	**Stem**	**Pods**
5 Oct 06	505	1178	135
18 Oct 06	376	861	189
6 Nov 06	292	1100	209
17 Nov 06	126	934	121
	Crude Protein (%)		
	Leaf	**Stem**	**Pod**
5 Oct 06	31.4	17.4	22.8
18 Oct 06	32.2	17.5	28.6
6 Nov 06	32.2	15.2	17.3
17 Nov 06	33.4	11.9	12.6
	Metabolisable Energy (MJ/kg DM)		
	Leaf	**Stem**	**Pod**
5 Oct 06	11.1	9.2	10.8
18 Oct 06	11.1	8.5	10.6
6 Nov 06	10.7	8.1	13.6
17 Nov 06	11.5	7.2	11.7

In 2006 it was observed that livestock would readily eat canola stem. This was not a universal experience with stock rejecting older tougher stems in some instances.

The best value from canola will likely come from grazing the leaf and pod while they are still available, and grazing stem when relatively soft and palatable.

Table 2.	**Wheat**		
Date	**Dry Matter (kg/ha)**		
	Leaf	**Stem**	**Head**
5 Oct 06	883	1282	805
18 Oct 06	517	920	1170
6 Nov 06	720	1051	1848
17 Nov 06	657	1188	1831
5 Dec 06	626	1074	1629
	Crude Protein (%)		
	Leaf	**Stem**	**Head**
5 Oct 06	16.9	7.0	12.2
18 Oct 06	12.4	6.3	14.7
6 Nov 06	8.6	3.6	12.8
17 Nov 06	6.7	4.1	13.0
5 Dec 06	7.1	3.6	13.1
	Metabolisable Energy (MJ/kg DM)		
	Leaf	**Stem**	**Head**
5 Oct 06	9.3	9.6	9.8
18 Oct 06	8.6	8.7	10.2
6 Nov 06	8.0	6.7	11.3
17 Nov 06	7.5	7.0	11.2
5 Dec 06	7.5	6.9	11.2

The leaf component of wheat was greater than canola in both total amount (up to 500kg/ha more) and percentage of available fodder (19% to 30%). Retention of the leaf was much higher than canola with over 70% remaining by early December. However, the feed quality was consistently lower and declined more rapidly than canola. Head material accounted for around 50% of dry matter and over 60% of the available MJ/ha after flowering.

The best grazing response from failed canola or wheat crops will come from early grazing where animals can select a high quality diet before the leaf content or quality declines. Growing or lactating livestock should get priority.

Selecting the best variety of perennial grass for your local environment and paddock microclimate to enhance persistence

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Part 1

Background

Many farmers and advisors have reported problems with establishing perennial grass-based pastures and the persistence of these pastures. Establishing perennial pastures is expensive and can be high risk due to variable climatic conditions in many areas where perennial pastures are sown. The risks associated with establishing new perennial pastures can be reduced and the probability of these pastures persisting in the long term can be greatly influenced by choosing varieties that are:

1. Well suited to the local environment – that is, choosing varieties that are compatible with the rainfall (both total and seasonal) and temperature conditions
2. Well suited to the paddock microclimate – temperature and moisture conditions vary greatly across paddocks particularly those with variable topography Imposing appropriate management strategies to aid long-term persistence – for example grazing management that allows for spelling at key periods in the pasture growth cycle, weed control and topdressing paddocks with fertiliser
3. Imposing management strategies that promote long-term persistence – for example grazing management that allows for spelling during key periods in the pasture growth cycle, weed control and topdressing paddocks with fertiliser.

The remainder of this article will address points 1 and 2.

It is critical that farmers and their advisors have a sound knowledge of the characteristics of different perennial grass varieties so that they can select those best suited to their specific requirements and climatic conditions. A key trait to consider in choosing a variety of perennial grass to sow is the level of "summer dormancy" that the variety exhibits.

The level of summer dormancy differs greatly between varieties of cocksfoot, phalaris and tall fescue and can have a significant impact on persistence especially in areas where long periods of summer moisture stress and/or high summer

temperatures occur. Large differences in climatic conditions are experienced between different areas within a state, but conditions can also vary greatly within a paddock, particularly if that paddock has variable topography.

Summer dormancy in grasses – what is it and what role does it play in persistence?

Summer dormancy is a survival mechanism some plants have which enable them to shut down when temperatures rise and/or moisture becomes limiting. For cocksfoot and phalaris the degree of summer dormancy can be described in three ways:

1. Obligate dormancy – with this type of dormancy, plants shut down due to rising temperatures and declining soil moisture towards the end of spring. These plants do not respond to rainfall events in summer and only become active again when temperatures decrease at the end of summer or in early autumn. Such plants are very well adapted to surviving in areas with very long periods of summer moisture stress with little or unpredictable summer rainfall. These plants are often simply referred to as "highly summer dormant" or "Mediterranean" varieties. Examples of perennial grass varieties exhibiting very high levels of summer dormancy are Kasbah cocksfoot and Atlas PG phalaris.
2. Facultative/Intermediate dormancy – with this type of dormancy plants will shut down when soil moisture becomes limiting, however they will commence active growth in summer if significant rainfall events occur. Examples of perennial grasses in this group include most phalaris varieties and varieties of cocksfoot such as Currie, Uplands and Porto. Summer active – these plants exhibit no summer dormancy and will attempt to grow regardless of moisture, temperature conditions. They are often called "Temperate" varieties. These plants may fail to persist if exposed to an extended period of low soil moisture over summer.

It should be noted that the scale for summer dormancy/summer activity is continuous, so while a variety may be described as summer dormant, the degree of dormancy it shows may be more or less than another variety also described as summer dormant, for example although both Currie and Porto cocksfoot are described as having intermediate dormancy but the level of dormancy is lower in Porto than in Currie.

Within tall fescues, varieties are usually described as being ;

1. Summer active – these varieties produce a significant quantity of their total annual production over the summer months. They are often also referred to as 'temperate' tall fescues

2. Semi-summer dormant – these varieties produce a greater proportion of their total annual production in cooler months and are often also called "Mediterranean" or "winter-active" tall fescues.

Until recently only summer active varieties of tall fescue were available in Australia, these were derived from parent material from cooler, higher rainfall areas of Europe. Recently new varieties of tall fescue have been developed and released from germplasm originating in harsher, drier environments of the Mediterranean and North Africa. Several of these new varieties contain an endophyte which is a naturally occurring fungus that can be beneficial in protecting plants from attack by insects and may also assist the plant in tolerating drought. Varieties containing this endophyte can be identified as the suffix "Max P" is included in the variety name e.g. Resolute Max P.

The relative activity of the cocksfoot, phalaris and tall fescue varieties described in this paper are shown in Figure 1.

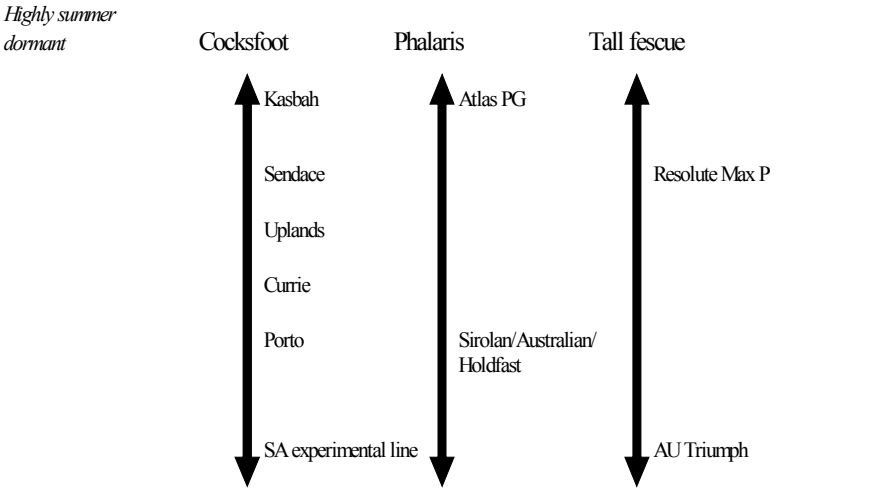

Figure 1 The relative summer dormancy/summer activity of cocksfoot, phalaris and tall fescue lines featured in this article

How much summer dormancy do you need?

The level of summer dormancy required for your specific environment and paddock situation will depend on:

1. Rainfall (total and seasonal), frequency of drought, intensity of drought – where summer rainfall is very low or the quantity received is highly variable, plants with higher levels of summer dormancy are better suited. Varieties from the obligate dormancy group will only commence growing when temperature and moisture conditions are favourable for plant growth. They also tend to be varieties that persist best in areas with lower overall annual rainfall and where frequent and intense droughts occur.

Varieties from the intermediate group will be able to use rain that falls in summer, but will become dormant when moisture is limiting and so in less extreme situations they may be well suited. Remember however, that if significant several significant rainfall events occur over summer and are interspersed with periods of moisture stress, then varieties from the intermediate dormancy group may be continually switching growth on and off. Each time this occurs plant carbohydrate reserves are depleted and if such a scenario happens frequently enough the plant will die. Varieties from the intermediate dormancy groups generally are best suited to medium rainfall environments with moderate to short periods of summer moisture stress.

Summer active varieties require reliable rainfall in summer and higher annual rainfall to persist. These varieties do not cope well with summer moisture stress and are the least drought tolerant.

2. Temperature – high summer temperatures increase evaporation rates and reduce the effectiveness of rainfall in summer. Where summer temperatures are high for long periods, varieties with higher levels of summer dormancy are likely to be more persistent. Higher levels of summer dormancy are particularly important for survival where high summer temperatures and low or unreliable rainfall is encountered. Also if certain areas of paddocks are subject to higher temperatures (for example northern and western facing slopes), choosing varieties with higher levels of summer dormancy for these areas is likely to enhance persistence.

In summary, varieties with higher levels of summer dormancy are best suited to areas with high summer temperatures, low or unreliable summer rainfall, low annual rainfall and those areas experiencing frequent and intense drought. Varieties exhibiting intermediate levels of summer dormancy need more reliable climatic conditions for persistence, that is areas with less intense summer moisture stress and lower incidence and intensity of drought. Summer active varieties require higher overall annual rainfall, require a large proportion of rainfall in summer and are not tolerant of drought.

In the past 5 years a number of experiments to evaluate the suitability of a range of perennial grasses have been sown in various regions of southern and central

NSW as part of the CRC for Plant-Based Management of Dryland Salinity program (now Future Farm Industries CRC) (Figure 2). The results of some of these experiments are shown in the remainder of this article.

Figure 2. Approximate location of perennial grass evaluation sites in NSW.

To be continued ……..

(Part 2 to be in the next Newsletter (No. 2, 2008))

The NSW Grassland Society is very grateful to its sponsors for their generosity. Without the support of our sponsors we would have very restricted activity. Premier sponsors have donated $3,000 (sometimes also 'in kind'). Major sponsors have donated $1,500 and Corporate sponsors have donated $750, Local sponsors $250.

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From the President's desk

From all accounts much of NSW is currently enjoying a better than average season with some areas in the north experiencing one of the best for many years. Some pockets are yet to receive as much rain as the more fortunate areas, so let's hope for rain in these localities.

Interest in pasture and forage crop sowings is high, but price increases for scarce herbicide and fertilisers are causing a lot of concern. I understand companies have experienced difficulty switching from drought mode to improved seasons, complicated by global factors well out of their control. Living in a global village produces advantages, but not without a few negatives.

Planning for the Tamworth conference is accelerating. This promises to be a most stimulating gathering of first class speakers who will deliver addresses detailing the latest information on subjects including temperate and tropical pastures, economics of pasture improvement at the farm level and soil health management. More information will appear from Loretta Serafin, the conference convenor as the date, July 21-23 approaches.

This newsletter is full of topical information. I draw your attention to the excellent article from Belinda Hackney, Brian Dear and Richard Groves who have written about pasture variety selection to enhance persistence. This is a very timely story against the background of rising costs of pasture establishment and the obvious need to get as much life from a permanent pasture to bring down the overall cost.

While on the subject of the newsletter that Haydn Lloyd Davies puts so much effort into; all members are invited to contribute by way of a technical article or a letter to the editor on a current topic. I know Haydn would welcome your contributions.

Best wishes to all members.

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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