Lucerne boasts better recovery

LEFT: Dr Brian Dear assesses perennial pasture species in trial plots at Barmedman. (Photo: Richard Hayes, NSW DPI)

By Annabel Bowcher
AnDi Communications

The survival of pastures in the cropping zone of southern Australia has been sorely tested during the current drought. However, lucerne pastures seem to be a success story during these dry times.

The ability of lucerne to recover from drought has been a welcome and green relief to those producers who have successfully managed their lucerne stands.

Recent research in southern New South Wales has shown that lucerne is still the best adapted perennial pasture species to drought conditions.

At a perennial pasture experiment established at Wagga Wagga, NSW, during spring 2004 by FFI CRC researchers Dr Brian Dear, Richard Hayes and Guangdi Li compared the persistence and productivity of a range of perennial pasture over three years.

The basal frequency (a relative measure of plant density) of the perennials has been assessed each year to determine how the various species persisted. Results showed that lucerne demonstrated superior drought tolerance in comparison to other perennials such as chicory, phalaris and cocksfoot (see Figure 1).

key points

- Lucerne continues to outshine other pasture species in terms of drought recovery and resilience
- Drought is wreaking havoc with annual species such as subclover
- Small seeded annual legumes such as gland and balanse clover could improve the drought resistance of mixed pasture swards.

Again, results from this research showed that lucerne was superior to perennial grasses such as the cocksfoot varieties Kasbah and Fraydo, known for their drought tolerance.

"Our research has shown that with proper management, lucerne is the best adapted species to drought conditions," Richard said.

"Lucerne consistently maintained the highest plant density after four drier than average years."

Rotational grazing is essential to the survival of lucerne plants as it enables the carbohydrate root reserves to be maintained. The pastures in the trial were 'crash grazed' by sheep in an eight-week rotation.

Annuals prove no match for lucerne

"The inclusion of a lucerne pasture in a mixed farming enterprise increases the reliability of the pasture feed base," Dr Dear said.

"It is also seen as a more resilient pasture legume option than annuals during drought conditions."

Evidence of this is clear with the annual pasture base of both annual and mixed annual/perennial pastures now extremely low in the southern cropping zone due to the long running drought.

The usually slow decline in the subclover component of a mixed lucerne/subclover pasture has been exacerbated and early or very late autumn breaks followed by limited rainfall in spring has not provided suitable conditions for annuals to establish or set seed.

"Annual pastures such as subclover are failing due to the dry autumns," Dr Dear said.

"When established under these conditions, annual pastures have poor dry matter production and their seed regeneration declines."

This decline in seed production substantially reduces plant densities in following seasons.

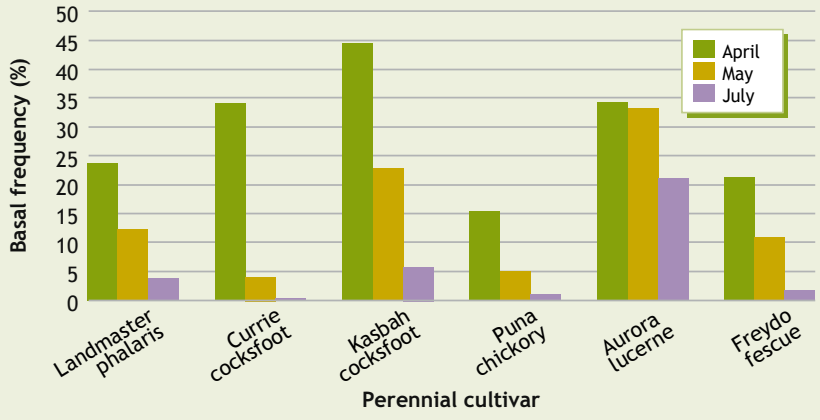
Earlier research in southern NSW by Richard indicated there are benefits of including small-seeded annual legumes in pasture mixtures. The research found that small seeded legumes such as gland and balansa clover had the capacity to set large quantities of seed under moisture stress compared with the more traditionally sown subclover.

"The addition of small seeded annual legumes in a pasture could complement a subclover/perennial pasture mix," Richard said.

"Further research is required to better understand the agronomy of these more diverse pasture swards.

"However, with appropriate management, the inclusion of small-seeded species such as gland and balansa clover could improve the resilience of mixed pasture swards to stresses such as drought."

FIGURE 1. Basal frequency* of six perennial pasture cultivars grown at Wagga Wagga during the current drought

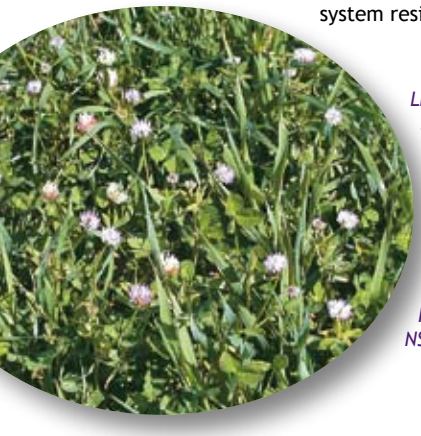


** Basal frequency is a relative measure of plant density*

Forward focus

Pasture resilience and the ever present issue of climate variability and change and its pressure on pasture persistence and production has become a focus for the FFI CRC. Dr Dear and his researchers are currently investigating ways to make pastures even more climate change resilient.

High on their priority list of research initiatives is how to include perennial grasses and other perennials, such as chicory, in the pasture phase so they complement the lucerne component. There also is the opportunity to look at how perennials contribute to whole-farm system resilience.



LEFT: Small seeded annual legumes in a pasture mix can increase resilience to climate variability. (Photo: Richard Hayes, NSW DPI)

"Well-managed perennial pastures have been shown to provide a range of benefits well beyond those associated with increased animal production," Dr Dear said.

"We need to understand and place a value on perennial pastures that does not purely relate to dry matter production."

Demonstrating the economic benefits of new perennial species, identifying the land type on a farm best suited to perennial pasture and the optimum area that should be sown to gain the benefits is part of the research the FFI CRC will undertake.

Dr Alison Bowman, who leads the Future Cropping Program in the FFI CRC, said new research within the CRC is aiming to better demonstrate the economic benefits of new perennial pasture species to producers in the mixed farming zones of Australia. Researchers are balancing these benefits against any potential environmental weed risk associated with perennial species.

"In many cases, producers hesitate to try new perennial species because of the higher upfront costs and more difficult management requirements. But the benefits of these plants in terms of pasture persistence and production need to be quantified across a whole farm and a range of seasons," said Dr Bowman.

The FFI CRC is developing tools to help producers determine the optimum area of their farm to be under perennial systems to gain these benefits. These tools will also help producers pinpoint the land type on the farm that may be better suited to a perennial pasture rather than an annual crop.

Dr Dear believes the economic benefits of perennial pastures should also take into account their contribution to the farm business from a sustainability and importantly, a social perspective.

It is essential to place an economic value on, for example, the sustainability benefits of perennial grasses (including increased groundcover and improved soil structure and fertility) and the potential savings in labour costs that can be attributed to including perennial species in annual-based farming systems.

There is no doubt that research outcomes that assist producers to better manage their farming enterprises during times of climatic variability will be well received and adopted on-farm.

More information

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Proof is in the paddock

It is not just researchers who are witnessing the decline in pasture species during the prolonged drought conditions.

Private agronomist Greg Condon is seeing first-hand the state of pastures in the region.

"Even with decreased stocking rates, there is still a large amount of bare ground visible in the pastures," Greg said.

"The dry autumn and cold winter have seen a marked decline in pasture growth this season.

"Most pastures are producing less than 10 kg/DM/ha per day due to the lack of groundcover and leaf area. As a result, producers are forced to continue hand feeding stock."

Regardless of the extended drought, Greg has seen lucerne paddocks that currently have 1500 to 2000 kg DM. This further demonstrates the valuable on-farm benefits of this resilient perennial.

"Lucerne is certainly the pick of the perennial pastures in the south-west slopes, but to the detriment of the annual subclover component," Greg said.

Even under rotational grazing, chicory and perennial grasses such as phalaris are declining and both subclover and annual grasses are making limited contributions to pasture biomass this season.

With limited cash flow, the high cost of pasture seed for species such as phalaris is seeing little re-sowing of pastures.

Rather than completely renovating pastures, some producers are direct drilling oats and subclover into lucerne. Producers in high rainfall areas are oversowing with short-term ryegrass and clovers such as balansa or arrowleaf.

"Mixed farmers are still undersowing crops with lucerne and shorter season subclover mixes," said Greg.

"In some instances small seeded annual clovers such as arrowleaf clover have also been added to subclover mixes."

In the mixed farming areas of southern NSW, some producers have reduced stocking rates in recent years and increased their area of crop. According to Greg, any remaining lucerne pastures are used for backgrounding and agistment before fallowing. This still makes a contribution to the farm system with nitrogen input, weed management and valuable cash flow. And it has relieved the cost of both feed and labour associated with feeding livestock during the current drought.

Producers have also benefited this season from sowing grazing crops such as wheat, triticale and oats. These crops have improved the livestock weight gains and provided an opportunity to rest pasture paddocks.

Farm planning and strategic management decisions have played a key role in the pasture production available during winter and early spring.

Greg says the more positive pasture stories have been particularly seen in sheep enterprises where tight lambing intervals of five to six weeks during late winter/spring and well developed feed plans by producers are paying dividends.

"Producers who have put in drought lots to feed their livestock are seeing the benefits of this management practice to their remaining pasture paddocks.

"The drought lots are providing the remaining pasture paddocks a much needed autumn spell. Winter and spring lambing ewes, which always require additional feeding, can be then turned onto the recently spelled lucerne paddocks."

Greg has also observed that in the higher rainfall areas, existing lucerne pastures are complemented by the use of native perennial grasses such as red grass and wallaby grass. Producers have recognised the value of these grasses and strategically fenced these areas to enable better pasture utilisation using rotational grazing.

More information

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