Far South Coast Landcare

Farmers NETWORK

Managing African Lovegrass in native pastures in the Bega Valley

Information Sheet 1

"if we increase diversity (of native pasture) we are increasing the resilience of the landscape and also the health of my stock."
Bega Valley landholder

Lowland grassy woodland dominated by *Angophora floribunda* with a native pasture ground layer. Bega Valley, NSW.

Native pastures and lowland grassy woodlands

Invasion by African lovegrass (ALG, *Eragrostis curvula*) is a major threat to production based livelihoods and conservation in the Bega valley. ALG is an invasive, summer active (C4), perennial grass and a serious threat for both livestock production and for the functioning and composition of the native pastures and grassy woodlands.

Low input native pastures and woodlands are an important part of the Bega Valley landscape. They contribute to production and landscape values through drought resilience, pasture production, soil protection and shelter for livestock.

Recent research in the Bega Valley found that native pasture paddocks, with a mix of scattered trees and open areas support from 80 to 145 different plant species. This includes plants with widely different growth forms and life cycles. The diversity of both species and growth strategies can increase the potential of these pastures to provide production and landscape resilience in response to climate variation.

"Our native country used to be the cheapest to run and now, because of lovegrass, it costs us more than anything....."
Bega Valley landholder

Notes to Table 1

1. The effect of ALG on the farm business as a whole will vary depending on what proportion of the farm it has infested. If it has affected 80 % of the farm, as on some beef/sheep properties, then 25 % reduction in income below potential may be a reasonable estimate.

2. These results do not account for costs of ALG control or possible changes in some whole farm variable costs as a result of reduced numbers of livestock e.g. animal health, fodder and selling expenses. Nor do they account for possible changes in variable costs directly arising from ALG such as increased managerial input and increased repair and maintenance on machinery.

"...not doing maintenance, fiddly jobs, now spend time slashing... waste time in paddocks, can't bring cattle in in one hit... can't see wombat holes - it's dangerous!"
Bega Valley landholder

ALG reduces profitability

ALG has low palatability and, once dominant (>2/3 of pasture cover), can reduce pasture carrying capacity by >50%. This, in turn, reduces the profitability of farm operations (Table 1). If income declines by 25% and nothing else changes, then net profit and return on capital more than halve.

ALG dominance can also increase the costs of production, risk and threats of fire and the labour required to do everyday farm work (eg. mustering, fence repairs). Swards of ALG can obscure hazards within the paddock, presenting serious health and safety risks. These changes could substantially increase whole farm variable costs.

Table 1. Hypothetical example of the impact of ALG on whole farm profit and return to capital once ALG has reduced income by 25%.

	Farm 'clean'	Farm with ALG
Assets	$900,000	$900,000
Income	$130,000	$97,500
Overheads	$45,000	$45,000
Whole farm variable costs	$24,000	$24,000
Net profit	$61,000	$28,500
Return on capital	6.78%	3.17%

ALG reduces pasture and seedbank diversity

ALG invasion can reduce pasture species diversity by 50% or more. Reductions in pasture diversity will have indirect impacts on ecological processes such as pollination and nutrient cycling. Declines in plant diversity will also reduce the year-round availability of palatable green feed. Studies have shown that diverse pastures provide livestock health benefits - in pastures with heavy ALG infestations livestock will find it difficult to select diverse forage.

Pastures with low plant species diversity can also have fewer species with viable seeds in the soil (the soil seed bank).

Avoiding ALG dominance will be more profitable than any strategy for reducing or utilising a dense sward.

"...drought decimated everything...lovegrass took off after rains because there was no competition... everything we'd done up 'till then was a waste of time..."
Bega Valley landholder

Lovegrass now dominates this paddock that was mostly clean prior to the 2002-2010 drought.

Research in the Bega Valley found that the soil seed bank was less diverse under dense ALG swards. The soil seed bank plays an important role in pasture recovery after ALG control: Pasture soils containing fewer seeds and of a smaller number of species will have less capacity to naturally recover and may require costly re-sowing.

Drought, bare ground and grazing management

The costs of managing ALG, once it has taken over, are substantial, regardless of the approach (elimination, reduction, utilisation) (also see Information Sheet 2 Roller Wiping). Avoiding ALG dominance through careful grazing management, vigilance and consistent control efforts, can seem costly, but will almost always be more profitable than later dealing with a dense infestation.

Maintaining competitive pastures at all times is essential to preventing ALG invasion. Livestock, wildlife, vehicles, water and wind are important vectors for long-distance dispersal of ALG and putting in place farm based procedures to ensure early detection is essential. While vigilance is important, landholders in the Bega Valley have identified that bare ground, particularly during drought, is the primary precursor to ALG invasion and dominance (Table 2).

Table 2. Factors identified by Bega Valley livestock producers that contribute to increases in the spread or abundance of ALG (from interviews with 15 landholders).

Factor	Number of Producers
Drought/Break of drought	12
Bare ground	8
Spot or boom spraying herbicides	7
Livestock (via dung)	6
Soil disturbance/cultivation	5
Slashing	5
Overgrazing	4
Lack of pasture competition	4
Wind	3
Low soil fertility	3
Burning	3
Machinery (direct vector)	2

Plan for drought and aim to maintain ground cover by acting early.

Livestock decision making should be early and decisive to avoid bare ground and loss of perennial pastures and to maximise the resistance of the pasture to ALG invasion.

Bega Valley landholders have observed that where either kangaroo grass or kikuyu are present, the average abundance of ALG is lower (see Table 3 on page 5). This finding has been supported by pasture research. Management focused on maintaining the competitive ability of either kangaroo grass or kikuyu may be effective at slowing the rate of ALG invasion.

Dense old stands of ALG can carry >15 tonnes dry matter /ha, creating a substantial fire and management risk.

Other management strategies

Chipping, spot spraying with fluproponate and roller/wick wiping can also be important management tools. Spot spraying with fluproponate can be highly effective during the early stages of invasion. However, spot and boom spraying are often reported as major causes of increased ALG invasion and pasture degradation (see Table 2 on page 3). Getting application rates correct and avoiding over application are crucial.

Roller wiping can be a useful lower risk strategy (see Information Sheet 2 Managing ALG with Roller Wiping) applicable at both early and late stages of invasion. Preliminary investigations suggest that in many situations it can be a profitable component of strategies aimed at reducing lovegrass dominance.

Slashing and burning are often used to reduce the amount of standing dead ALG litter, increase light availability and increase palatability of ALG. In dense swards these strategies can be useful to improve livestock utilisation and reduce wildfire risk.

During research on ALG in the Bega Valley, 6 of 15 producers noted that slashing and burning can increase the density of ALG within a paddock (see Table 2 above). Initial pasture surveys confirmed this for slashing.

"Lovegrass burns so much hotter, kangaroo grass will burn as a mosaic....(now) avoid burning, as it takes out natives"

Bega Valley landholder

Slashed African lovegrass pasture, Bega Valley.

Slashing is expensive (estimated costs range from $90/ha to $190/ha) and only in certain cases likely to be profitable. The profitability of slashing will primarily depend on how often slashing is required and the increase in stock numbers that result from the improved utilisation. If slashing is used as part of a ALG management strategy, managers will need to carefully assess how to incorporate it into their livestock production system.

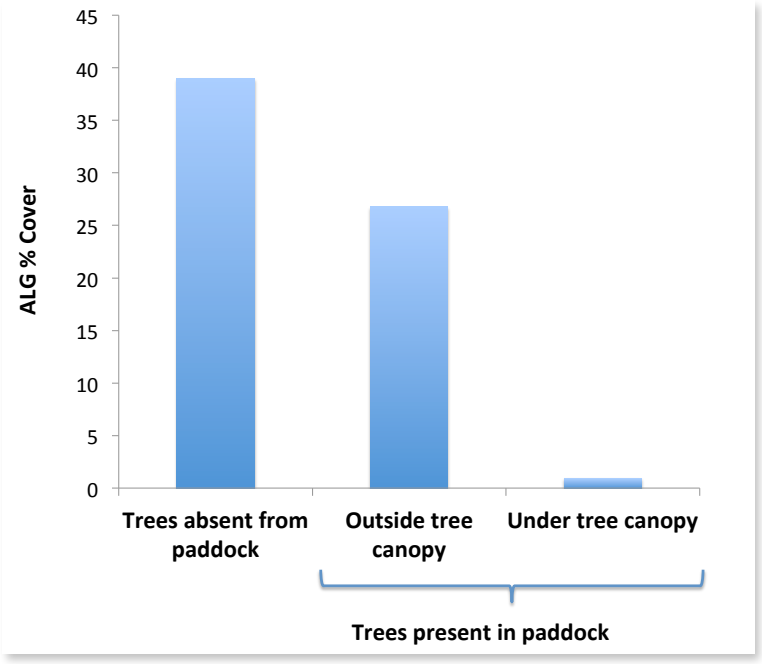
Trees and ALG

ALG is thought to be less likely to invade pastures with scattered mature trees (Table 3). Pasture research in 57 pastures in the Bega Valley supported this observation (Graph 1) and also found that paddocks with trees had more diverse pastures and soil seed banks.

Wooded pastures are often dominated by the palatable native perennial weeping grass (*Microlaena stipoides*). This species is better adapted to the lower light levels under tree canopies.

Table 3. Factors Bega Valley cattle/sheep producers have identified to be associated with lower ALG densities or slower rates of ALG invasion. From interviews with 15 landholders in the Bega Valley.

Factor	Number of Producers
Kikuyu pasture	10
Trees in paddocks	6
Drainage lines/ swamps	5
Kangaroo grass pasture	4
Heavily fertilised pasture	3
Cattle camps	3
Irrigated pasture	2



Graph 1. African lovegrass is less abundant when trees are present, particularly under a tree canopy. Data from 57 pastures in the Bega Valley, NSW.

ALG tolerates a broad range of soil fertility and fertilisation alone should not be relied upon as a control strategy.

For further information on managing ALG see:

Crosthwaite, J. and J. Dorrough (2014) Economics of controlling African Lovegrass (*Eragrostis curvula*) in native pasture in the Far South Coast of NSW.

&

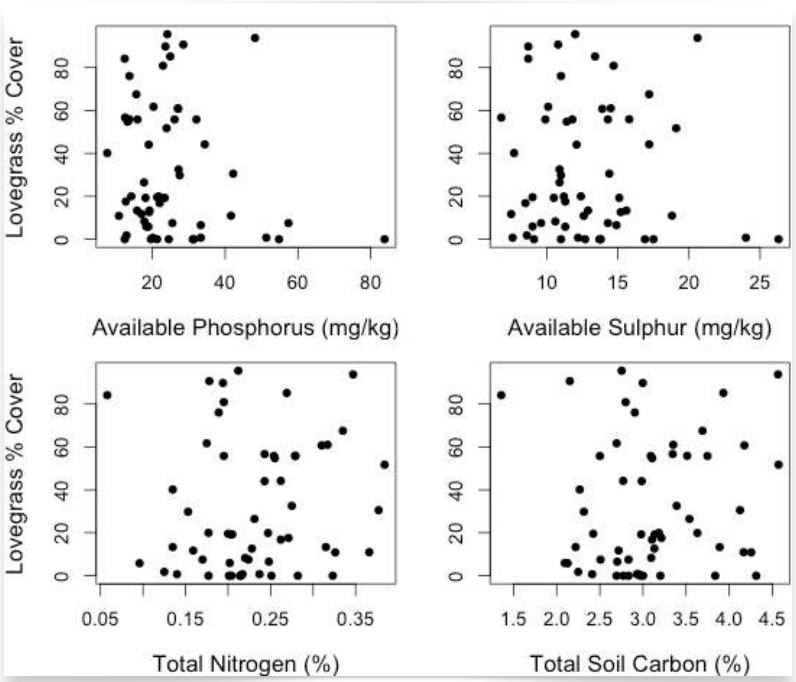
Managing native pastures and African Lovegrass in the Bega Valley. Information Sheet 2: Roller Wiping

Available from the Far South Coast Farmers Network & FSCLA

http://www.fscla.org.au

Are heavily fertilised pastures more resilient to invasion?

ALG has been observed to be less abundant in more fertile pastures, such as where cattle camp, irrigated pastures and heavily fertilised pastures (see Table 3 on page 5). However, surveys of 57 different pastures in the Bega Valley indicate that ALG occurs across a wide range of soil fertilities (see Graph 2 below). Grazing management decisions aimed at maintaining competitive pastures are likely to be more important in reducing the rate at which ALG invades than soil fertility.



Graph 2. Lovegrass occurs in pastures with both low and high soil fertility. Data from 57 pastures in the Bega Valley.

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