Managing African Lovegrass in native pastures in the Bega Valley

Information Sheet 3
Lowland Grassy Woodlands

Invasion by perennial grass weeds, such as African lovegrass, is one of the major threatening processes in endangered Lowland Grassy Woodlands

Large African lovegrass tussock growing in sand on the Towamba River

Lowland Grassy Woodlands were once widespread in South-Eastern Australia. They included a great diversity of species, particularly grasses and herbs in their ground layer. They are now listed as an endangered ecological community (EEC) under both the NSW Threatened Species Conservation Act and the Federal Government Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.

Today, in the Bega Valley, they are mostly represented as scattered old paddock trees over a predominantly exotic pasture or as extensive and low diversity native pastures. Most remnants of this ecosystem are highly modified but some higher quality examples still persist on private farmland and in town reserves, cemeteries, road reserves and travelling stock reserves.

All remaining grassy woodlands are potentially threatened by weed invasion, and in particular by African lovegrass (*Eragrostis curvula*). This perennial, vigorous, drought tolerant, pasture grass, along with others such as serrated tussock (*Nassella trichotoma*), parramatta grasses (*Sporobolus species*) and coolatai

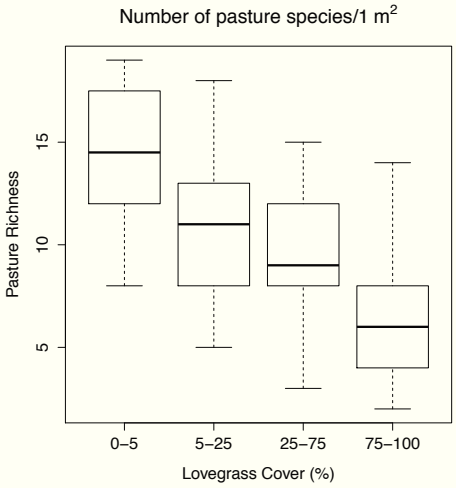
Dark coloured flower spikelets

grass (*Hyparrhenia hirta*) is a major threat to biological diversity in native ecosystems, particularly in grasslands and grassy woodlands.

Recent, ongoing research in the Bega Valley is beginning to shed light on the effects of African lovegrass on grassy woodlands and is improving our understanding of when and where African lovegrass is most likely to occur.

To get a better understanding of the longer-term dynamics of African lovegrass in the Bega Valley, interviews with land managers were combined with field research. Starting in 2013, research has been undertaken on fifteen properties whose managers had experience managing African lovegrass in native pastures. A number of major themes arose from this research.

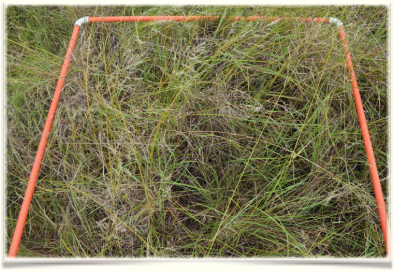
African lovegrass reduces plant diversity



Right, graph (boxplot) showing the effects of African lovegrass on pasture diversity in the Bega Valley. On average dense swards can reduce diversity by more than 50%.

African lovegrass is a highly competitive species with rapid growth in warm months and repeated seed production throughout the growing season. Grazing animals tend to avoid African lovegrass, due to the low quality of the forage, giving it a competitive advantage over other pasture species.

Dense swards of African lovegrass have very low plant diversity. As African lovegrass swards age, litter accumulates and light levels decline. Only a small number of shade-tolerant native species such as weeping grass (*Microleana stipoides*) and twining native species like *Glycine tabacina* are able to persist in mature swards.



Dense swards of African lovegrass can form a monoculture

The effects of African lovegrass also extend below ground. Seed bank diversity is lowest under dense swards of African lovegrass. Light infestations or areas only recently invaded however, can still retain diverse seedbanks. Therefore, acting early and preventing African lovegrass invasion is important for retaining the diversity of grassy woodlands both above and below ground.

Maintaining ground cover, especially during drought, is the most important strategy for managing lovegrass invasion

Slashed lovegrass with dense windrows of mulch - slashing is an important strategy for reducing fuel loads but also spreads lovegrass and is not an effective control measure

Ungrazed roadside dominated by Kangaroo grass resisting invasion from African lovegrass which dominates the adjacent paddock

... areas dominated by kangaroo grass tended to be more likely to resist invasion...

Manage grazing pressure during drought

African lovegrass invasion is episodic, with highest rates of invasion occurring during or just after drought. The underlying factor is likely to be the lack of competitive species and presence of bare ground for seedling establishment. Managing wildlife and livestock grazing pressure during drought is essential for maintaining pasture cover.

Avoid overgrazing, soil disturbance, slashing and burning

These have all been observed to increase the rate of African lovegrass invasion.

Lowest plant diversities and highest lovegrass densities have been found in areas managed by slashing. Slashing will spread seed into new areas and should be limited to those situations where it is necessary for biomass control and fire prevention. Roller wiping would be a cheaper and more effective strategy in the long-term.

Fires, usually considered a useful and important management tool in grassy woodlands, are much more intense in African lovegrass dominated pastures owing to the exceptionally large fuel loads that accumulate (in excess of 10 tonnes/ha). Anecdotally, burning in grassy woodlands invaded by African lovegrass favours the invader not the native species. In some circumstances burning may be useful as part of a broader strategy but it relies on careful follow up management.

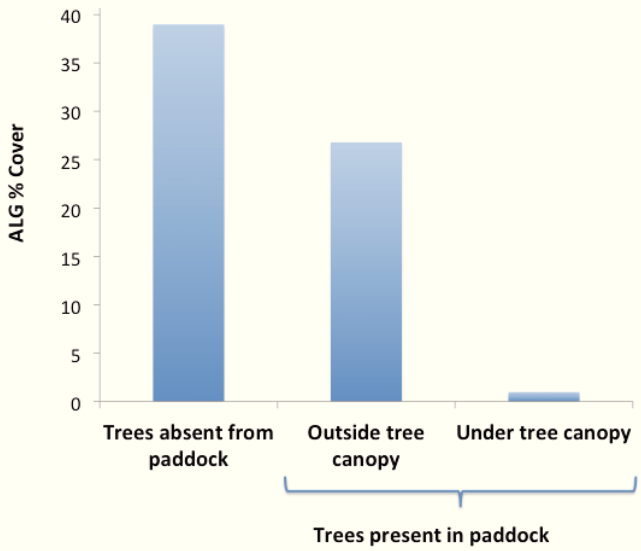
Benefits of competitive pasture

The interviewed landholders were asked to nominate those circumstances where lovegrass invasion tended to be slower. The importance of competitive pasture was highlighted. In fertilised pastures kikuyu was identified as a species that effectively competes with African lovegrass. In native grassy woodlands producers identified that areas dominated by kangaroo grass (*Themeda australis*) tended to be more likely to resist invasion. Field research confirmed that the presence of these pasture species was associated with a lower abundance of African lovegrass. Increased soil moisture and soil fertility, both which increase the growth rate of existing pasture, were also identified as associated with lower rates of lovegrass invasion.

Remnant woodland with only sparse lovegrass invasion in between the tree canopy

The protective effect of trees

A common observation was that rates of lovegrass invasion were lower where there was a tree canopy. Field research has supported these observations. Light availability could be a key factor. The field surveys found that, on average, lovegrass abundance tended to be lower in pastures with woodland trees and there was a higher abundance of African lovegrass further away from the shade provided by the tree canopy.



Above, the average percentage cover of lovegrass in 1m^2 quadrants in open pastures and in woodlands. Lovegrass density in woodlands was much lower under the canopy.

Areas that still retained a tree canopy also supported a higher diversity of grasses and flowering plants in the ground layer (see graph below). This is a common observation in grassy woodlands and in some cases almost twice as many plant species were found to occur in areas with woodland trees than in open native pastures.

Results have shown that well-managed grassy woodlands with good tree cover and Kangaroo grass dominance in the open areas can be relatively resistant to invasion by lovegrass.

Right, graph (boxplot) showing the differences in the number of different plant species in a 20m x 20m plot with and without woodland trees. The data are from surveys of Bega Valley native pastures. Dark lines are the median values.

Even remnant woodlands can eventually be dominated by African lovegrass if early action is not taken

Early detection and control of a small infestation will always be more successful than trying to remove a large infestation

For further information on the management of ALG see:

Managing African lovegrass in native pastures in the Bega Valley - Information Sheet 1 & Information Sheet 2 Roller Wiping

Available from the Far South Coast Farmers Network.

http://www.fscla.org.au

Controlling African lovegrass in Grassy Woodlands

In all cases, early detection and control of a small infestation is better than trying to control a larger infestation. Many methods of removing African lovegrass can be more detrimental to native grassy ecosystems than the initial effects of the invader. Several options are however available for controlling African lovegrass, depending on the scale of the invasion.

Manual removal and spot spraying

In the early stages of invasion manual removal and spot spraying can both be effective. If using manual removal, it is essential that all of the plant tillers are removed. Covering the disturbed area with mulch, or preferably a seed (native or sterile cereal) and mulch mix, can decrease the probability of African lovegrass germinating from the soil.

Herbicide is an important part of African lovegrass control. However, a number of producers found that invasion was more rapid in areas that had been sprayed with herbicides. Correct rates and equipment calibration are essential to prevent ongoing and increasing dominance.

Flupropanate - Successful use of spot sprayed flupropanate herbicides is dependent on use of appropriate rates, calibration and understanding the different tolerances of the grass species present. Flupropanate is a partially selective grass herbicide with a residual effect (up to 3 years) and is absorbed through the plants roots after rain (surfactant should not be used). Some perennial grass weeds are very sensitive (e.g. serrated tussock) while some native species are relatively tolerant (eg. kangaroo grass). This makes selective control achievable, depending on the dominant species in the pasture. However, while African lovegrass tends to be more sensitive than kangaroo grass, it is more tolerant than many other native grass species (e.g. weeping grass). It is best to seek advice on appropriate rates for particular pastures. Over application of flupropanate will lead to poor outcomes and can result in a worsening weed problem.

Glyphosate - Spot spraying with glyphosate should be restricted to open and sparse infestations where direct application to only the target plant can be assured. Glyphosate is not selective and

will kill competitive native grasses and native forbs. Inappropriate use of glyphosate can lead to a much worse infestation.

Boomspraying should be a last resort in native grassy ecosystems.

Boomspraying

In more extensive infestations manual removal and spot spraying are less effective. In these cases, boom spraying with flupropanate has been a traditional control method. Where the co-occurring pasture species are relatively more tolerant of flupropanate, this can be an effective strategy. However, many landholders have had disastrous outcomes following boom spraying. It is essential that appropriate rates are used and equipment is calibrated. Boom spraying should be a last resort in native grassy ecosystems.

Roller wiping in native pasture

Roller wiping

In larger infestations a lower risk strategy is the use of roller or carpet wiping (with glyphosate). This has been found to be a profitable control strategy in most livestock production situations. On small properties use of contractors will usually be more cost-effective than purchasing equipment. This approach relies on the differential palatability of African lovegrass and the other plant species to ensure only African lovegrass is targeted. For more details on the factors influencing the success of roller wiping see the FSCLA information sheet (*Managing native pastures and African lovegrass in the Bega Valley* Information Sheet 2 - Roller Wiping at www.fscla.org.au)

African lovegrass spreading along a farm track

Monitoring and Follow up

African lovegrass produces many small seeds that are readily transported by wildlife, livestock, people and vehicles. Pathways used by animals and vehicle tracks are prime places to regularly inspect for early stages of invasion.

In all cases where African lovegrass control has taken place, on-going follow-up is required. Identify and, ideally, map where African lovegrass occurs and aim to check for plants in those locations several times every year.

Far South Coast Landcare

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