

# AFRICAN LOVEGRASS

*Eragrostis curvula*

## Options for Improved Management



Published and Distributed by Granite Borders Landcare Committee



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African lovegrass (*Eragrostis curvula*) has been in Australia for more than 100 years. Many different types were introduced from Africa, where it was considered to be a useful pasture species with good soil conservation characteristics. Its impact as a major weed has increased dramatically in the past 3-4 decades. It is a highly aggressive and resilient invasive species which can readily form monocultures in grassland/ woodland systems.

Regional eradication is not possible, and it is most likely that infestations will continue to occur in new areas, and to become more serious locally. Management systems need to be considered for maintaining livestock productivity and a level of environmental integrity.

Lovegrass dramatically reduces livestock carrying capacity and individual animal production. In a typical lovegrass infested paddock without intensive management, grazing stock concentrate almost solely on patches of other species, and derive little nutrition from the lovegrass itself. As a result, the lovegrass is able to invade the areas of more palatable species.



Tall, vigorous green type on left. Shorter, less vigorous, more palatable blue type on right. Fence line protected from fires by application of glyphosate.

The current and potential impact on native flora and fauna is very significant. The competitive ability of lovegrass, especially with occasional burning, drastically reduces or eliminates other plant species; populations of wildlife are threatened through hot fires and habitat loss; birds can not access the seed from seed heads, and few bird species utilise the litter for nesting.

Lovegrass fires are extremely hot, destructive, and difficult to control.

The many types of lovegrass that have been introduced can, for practical purposes, be considered as two distinct types: the tall, extremely aggressive green type, and the shorter, more palatable and less aggressive “blue” type.



Mix of green and blue types, after fire. Note absence of other more useful species.

## ADAPTATION

Understanding the growth and adaptation of lovegrass is important in determining appropriate management and suppression/control.

Seedling growth is slow and therefore maintaining a vigorous, dense pasture offers the best chance of controlling its spread. Lovegrass matures extremely quickly, and is palatable only in its early growth stages. Leaves and stems are very slow to break down after trampling or slashing, in dense swards this can have a major impact in terms of smothering seedlings and mature plants of more desirable species. It flowers primarily from early summer in the Northern Tablelands, with most seed produced in January-March; it can seed year-round in warmer environments. It seeds prolifically, and spreads rapidly, particularly into lower fertility and disturbed sites, through the movement of livestock and machinery/vehicles.

## Soils

Lovegrass is best adapted to acid soils of a sandy to loam texture. It can grow on very infertile soils and therefore improving the overall fertility of soils, presents an option for its control. Through extensive trials it was noted that liming did not significantly suppress lovegrass in the Tenterfield area. It will invade on various soil types, but is generally less invasive and persistent on heavy clay soils. It tolerates moderate levels of salinity.

Lovegrass root systems can penetrate to 5 metres, but it also grows on very shallow soils. Horizontal roots can spread to 1 metre, accessing soil moisture and nutrients between clumps and competing strongly with other species trying to invade those gaps. It is very tolerant of moisture stress, and responds rapidly to small rainfall events.

## Temperature

Lovegrass has extreme cold tolerance. It is generally winter-dormant, but spring regrowth is very rapid.

## Shade

Lovegrass has moderate shade tolerance, and can readily invade open woodlands. In Tenterfield Shire, lovegrass typically does not invade sites dominated by scrub apple. It does not tolerate heavy shade.

## Burning

Lovegrass, at least in the Northern Tableland's environment, increases with regular burning. It supports extremely hot fires which kill most companion vegetation.



Regular burning can lead to lovegrass monocultures

## Grazing

Lovegrass tolerates continuous grazing, but is more vulnerable to occasional very heavy "crash grazing", particularly during the growing season. Extending the palatable phase and maintaining heavy grazing for as long as possible can reduce its energy reserves and weaken its competitive ability.



Paddock with almost continuous grass, with invading lovegrass. The lovegrass will rarely be grazed, and will continue to expand, under such management.

Continuous lenient grazing allows stock to avoid the lovegrass, and to concentrate grazing on more palatable species. This leads to more lovegrass dominance, a very patchy grazing pattern, and poor levels of overall utilisation.

## Nutritive value and palatability

Digestibility may range from 65% in very young fresh grass to 40% in standover roughage, with crude protein dropping from 18% to 4%. In hay cut from fresh grass about 10 days after seed head emergence, crude protein may exceed 10%, but the difficulty is always in maintaining the "freshness" of the grass for a long period.



Palatability declines very quickly with age of regrowth. It is important to keep the sward in a palatable phase for as long as possible e.g. by slashing/ mulching. Application of nitrogen fertiliser increases palatability. Provision of high protein licks encourages higher levels of utilisation of more mature swards. This will also occur if stock have adequate access to high quality forage legumes.

## Productivity

Lovegrass can be very productive in terms of biomass. Typical yields may be 3-10 tonnes of dry matter (DM) ha/annum, but will greatly exceed that under favourable conditions. Productivity more or less doubles by increasing the grazing/cutting interval from 4-8 weeks, which has major implications for control.

## Animal production

Typically, with lovegrass systems that are not very intensively managed, both carrying capacity and liveweight gains are very low. The nutritive value of the lovegrass is very low, and stock tend to avoid grazing in areas of dense infestation. In formerly highly productive grazing land in the Tenterfield area, livestock production has commonly decreased to less than 50% of its earlier levels.

## Grazing

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## OPTIONS for MANAGEMENT, SUPPRESSION, CONTROL

For most producers, a combination of approaches are necessary for control/suppression or improved management. Clearly, different options are needed where infestations are inaccessible, or on less intensively managed land (such as more remote roadsides, stock routes etc.) The challenge to control the grass, or maintain livestock productivity from heavily infested areas, is massive. It typically demands a combination of approaches, and thorough follow-up over a long period.

The management options facing producers are:

- Grazing management
- Slashing / mulching
- Fostering a shift towards healthier soils
- Planting of “cleaning” crops
- Herbicide application
- Fire management
- Establishment of alternative competitive pasture species

### Grazing management

Grazing management depends largely on the level of infestation. The general objective of grazing management is to keep the lovegrass in a palatable state for as long as possible, and to enable palatable companion species to strengthen. Slashing or mulching can greatly increase the period and intensity of utilisation.



The slashed strip is still palatable and also has some potential for recovery of companion grasses and legumes.

Grazing utilisation has been dramatically improved following herbicide knock-down, primarily through improved access to companion pasture species.

Crash grazing (with large numbers of stock on a confined area for a relatively short period) will force the stock to consume more lovegrass, without giving them the opportunity to focus on the more palatable species. The positive impact will be enhanced if taller more mature clumps are slashed or sprayed prior to grazing. Crash grazing as a sole strategy will not enable control of the lovegrass, but extends the active growing phase of the lovegrass, and enables a more productive mixed pasture.

Heavy grazing through spring and summer has a much greater impact on suppression than heavy grazing in winter (lovegrass is more vulnerable to damage during an active growth period, than when it is dormant.)

Providing high protein feed supplements, or ensuring access to productive forage legumes, enables higher utilisation of the lovegrass.

### Seed transfer

Moving stock from infested to clean areas can result in new infestations. If this is a concern, grazing in a small “quarantine” paddock for at least 10 days can be effective.

### Slashing/mulching

Slashing/mulching of the lovegrass, during the active growth months and in early autumn can, significantly extend the period for which the lovegrass is palatable and can enable better utilisation through winter. Repeated slashing reduces seeding and lateral spread.

Slashing supports stronger growth of the companion pasture species, provided the volume of slashed material is not extreme (i.e. provided it does not smother the desirable pasture species).

Slashing benefits are enhanced by regular crash grazing.

### Fostering a shift towards healthier soils

There are typically major problems with the physical, chemical, and biological fertility of soils under strong stands of lovegrass.

Many producers have found that they can reduce the dominance of lovegrass, and increase the amount of improved pasture, by the development of “healthy” soils.

Superphosphate alone has generally not been very effective with lovegrass, except in enabling higher stocking rates. Correction of macro- and micro-element deficiencies (ascertained by soil testing) has resulted in a gradual reversion to productive

sown species on some sites, especially when combined with crash grazing (and occasionally even in the absence of grazing). This shift is more feasible before the development of a very dense lovegrass sward, and certainly more feasible with the short blue type than with the tall green type, for which spot spraying is likely to be necessary in most cases.

Much of the “soil health” could be retrieved with a productive and persistent companion legume, and with more effective recycling of nutrients through grazing; for this, the shift away from lovegrass dominance is crucial.



Shift to productive mixed pasture, through crash grazing combined with correction of soil nutrient deficiencies; zero herbicide use.

### Planting of “cleaning” crops

Cropping on heavily infested sites for one to two years provides an opportunity to reduce the lovegrass load; decisions to crop will be based entirely on economics and practicalities.

In dense lovegrass stands, burning may be necessary to enable cultivation; this could be avoided with forward planning to either killing the love grass with herbicide or crash grazing for long periods in the previous season.

Lovegrass has seed reserves which will persist for years, and which will germinate following the cropping cycle, albeit at greatly reduced rates. Following the cropping cycles is crucial to:

- Establish a very productive, dense perennial pasture;
- Grazing management to maintain 90 – 100% ground cover all year
- Maintain a meticulous program to continually rogue out lovegrass plants.

### Herbicide application

Effective suppression/control is feasible, but depends on a long-term commitment and rigorous follow-up monitoring. Some reports on appropriate herbicide use are contradictory, and it is best to use methods which have been proven within your

own environment. There are many differing opinions on chemicals, chemical mixtures, and application method and timing.

These herbicide recommendations are made subject to the product being registered for that purpose under relevant legislation. It is the user’s responsibility to check that registration or an off-label permit covers the proposed use. Always read the herbicide label. If in doubt, visit the Australian Pesticides and Veterinary Medicines Authority (APVMA) website at [www.apvma.gov.au](http://www.apvma.gov.au).



Reversion to productive mixed pasture after repeated herbicide application.

Lovegrass dominance; very low livestock production potential; high risk of hot fires.

Flupropanate (e.g. Taskforce®) and glyphosate (e.g. Roundup®) are both widely used herbicide or chemicals and there is now a wealth of experience on results in different environments.

### Notes:

*Lovegrass is typically more susceptible to herbicides when it is in an active growth stage. Treatment just prior to seed formation can have a longer term impact on reducing re-infestation.*

*Generally, the tall green lovegrass presents a more serious control challenge. Many producers who have developed alternative management/control mechanisms for the short blue type accept the need for herbicide control of the more vigorous type.*

*In all cases, it is important to have a vigorous pasture mix which will colonise after the lovegrass is killed or suppressed, to prevent re-invasion. Where productive mixed pasture exists within the lovegrass, application rates and procedures should be adjusted to minimise the impact on the superior species.*

*Specific competitive species are discussed in a following section. In some cases, because of differential susceptibility to the herbicides, these may achieve a competitive advantage following low herbicide application rates.*

- *Both glyphosate and flupropanate are idely used for control. Both can be effective in specific situations. Glyphosate kills the plants, but not seed. Flupropanate will kill germinating seed for a few years after spraying.*

- *Flupropanate has a withholding period for grazing stock, and broadacre areas must not be grazed by lactating animals. It is selective at registered rates. It is very slow acting, and the kill may not be apparent for at least several months. With correct application procedures and rates, companion pasture species can have good recovery within one season. With flupropanate spot-spraying of scattered tall green lovegrass, thorough wetting of the plant is crucial, and the drip zone around the clumps should also be sprayed to prevent seed germinating. Best results will occur if sprayed when soil moisture is good. Spot spraying with Flupropanate will leave a bare patch much longer than Glyphosate.*
- *Glyphosate offers a quicker kill and has the advantages of low cost and no withholding period, but the resultant bare ground encourages other weed invasion; reinfestation with love grass will also occur.*
- *Routine follow-up treatment is crucial.*

*Wick-wiping can be very effective following heavy grazing. Where the more palatable pasture species are grazed low and thus avoid most of the herbicide application.*



### Fire management

Fire management is a key factor in lovegrass ecology. Burning results in a short period of more palatable lovegrass, but every burn reinforces the dominance of the species, the loss of more useful companion vegetation, and the loss of soil fertility.

#### Note:

*Burning may sometimes be necessary prior to cultivation or at least 6 months prior to herbicide treatment, especially with heavy infestation of tall green love grass. In such cases, the immediate establishment of a highly productive sward is crucial, with follow-up herbicide treatment of regenerating lovegrass.*

There is a strong preference for other options for increasing palatability:

- keeping the grass in an actively growing phase for as long as possible (e.g. by slashing or strategic heavy grazing);
- improving the livestock intake of lovegrass by providing high protein licks;
- managing the sward to maintain a proportion of species with higher nutritive value.

Always try to avoid fire in any lovegrass areas. Do not burn paddocks with scattered lovegrass, as this will encourage a rapid shift towards total dominance.

If infrastructure needs to be protected through controlled burns, strictly limit the burned area (e.g. with cultivated fire-breaks.)

As with other options, it is important to include other more useful species with tolerance of burning.



### Establishment of alternative competitive pasture species

The selection of species for retrieving lovegrass dominant sites depends entirely on the location. Removal of the lovegrass without providing for replacement by other desirable species will result in gradual re-invasion of lovegrass and often an invasion of additional weeds.

In typical Northern Tableland areas where lovegrass has been at least partially controlled, there has been good regeneration of pasture species, including white clover, sub-clover, ryegrasses, tall fescue, and cocksfoot.

There will be many Northern Tableland sites where producers will not re-establish such pastures (for reasons of cost, poor access, the daunting scale of the infestation, or a lack of commitment.) There may then be a role for alternative pasture species with some capacity to persist and spread in lovegrass areas, without other inputs. The most promising species are those warm-season grasses which

have a similar competitive capacity and growth rhythm to that of lovegrass.

In lower altitude warmer sites there is a much greater array of competitive species with the potential for persisting within lovegrass swards and even providing direct competition. The inclusion of species with high nutritive value can assist in:

- maintaining the livestock production potential of the area;
- providing direct competition to the lovegrass;
- encouraging more utilisation of lovegrass, attracting stock into lovegrass areas to foster some grazing/ trampling.

Potentially useful species for competition with lovegrass on warmer sites include:

- *Pennisetum clandestinum* (Kikuyu)
- *Paspalum nicorae* (Brunswick grass) (being widely trialled in Granite Borders area with positive results in blady grass and promising signs in love grass. Not yet commercially available)
- *Paspalum notatum* (Bahia grass) (concerns over weedy characteristics)
- *Digitaria eriantha* (Digit grass)
- *Chloris gayana* (Rhodes grass)
- *Arachis glabrata* (Rhizoma peanut)
- *Leucaena leucocephala* (Leucaena)

## Management of improved pasture

When the improved species are established, it is essential to maintain very dense ground cover to avoid reinfestation with lovegrass. It is important to avoid overgrazing and the development of exposed ground.

## Combining different approaches

Effective control or suppression will demand a mix of interventions, with the balance determined by site characteristics and landowner interests. In areas of serious infestation, it will be a lifelong challenge.

Continual sharing of information on the results of all approaches is the key to a satisfactory long-term outcome.

*This publication was produced by Granite Borders Landcare Committee Incorporated with the assistance of Alan Robertson. Other contributions were made by Robert Hines (Contractor); Neil Rossington (TSC Weeds Officer); Jim Koch (Land Manager); Rod Dowe (Land Manager); Peter Grant (Principal Stanthorpe State High School); Warren Franklin (Head – Agriculture Dept, Stanthorpe State High School); Peter Rohan (Land Manager); Dr Bruce Cook (Pasture Genetic Resources Specialist); Geoff Robertson (Land Manager) and Barry Brooks (Land Manager).*

*The information contained in this publication is based on knowledge and understanding at the time of writing (January 2013). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information.*

*For further information consult your local agronomist or weeds specialist for individual advice.*

