



Tom's Creek
Landcare

African Lovegrass

East Gippsland
Best Practice Manual

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To effectively combat the African Lovegrass threat a diligent, integrated, coordinated and sustained effort over many years is required if we are to seize any opportunity to reduce the impact of African Lovegrass on Gippsland's unique natural environment and productive agricultural farmland.

This interim, Best Practice Manual for the identification, management and control of African Lovegrass in the Gippsland Region has been compiled to assist with this task.

Whilst consideration has been given to a range of previously published information, the experiences of many individuals and organisations from across the Gippsland region have been used to form the basis of this document.

The use of this interim, Best Practice Manual is recommended as a primary tool for supporting sound decision making in the battle against African Lovegrass in Gippsland.

We encourage its use by landowners, rural contractors, utility companies, government agencies and local authorities and all others with a responsibility for land management affected by, or at risk of invasion from African Lovegrass.

In compiling this document, it has also become evident that many variable and external factors have influenced previous African Lovegrass management and control efforts within Gippsland. In considering this fact, it is recommended that further field trials, observational research and evidence gathering of various African Lovegrass management and control methods be supported.

It is therefore recommended this document be viewed as an 'interim' Best Practice Manual, and its content be updated and adapted as further knowledge and evidence of successful African Lovegrass management and control methods suited to the Gippsland region are trialled, refined and confirmed.

PREPARED BY
Errinundra

PREPARED FOR
Tom's Creek Landcare

Overview

African Lovegrass (*Eragrostis curvula*) is a warm season perennial grass native to southern Africa. It has a high tolerance for low and erratic rainfall, and is capable of persisting through dry seasonal and drought conditions.

African Lovegrass is suggested to have been introduced into Australia by accident prior to 1900 with deliberate importation occurring after this time to trial the plant as a pasture and erosion control species. There are many beliefs on how African Lovegrass first arrived in Gippsland. Some indicate its arrival as a contaminant on droving stock brought down from the Monaro region of southern New South Wales, others suggest it was used for roadside batter stabilisation, and some indicate its arrival in contaminated fodder brought into the area during the dry years of the late 1960's, early 1970's.

Regardless of initial source and location of establishment, African Lovegrass since this time has become recognised as a serious threat to the Gippsland region and there has been an ongoing effort to reduce the impact of this invasive weed on the Gippsland landscape.

The challenge of African Lovegrass identification, the plant's adaptability and capacity to readily set seed, along with successive dry seasons has made this task particularly challenging. Within Gippsland, African Lovegrass has demonstrated a persistent capability to survive harsh dry seasons and to respond rapidly to any favourable weather conditions. In particular, African Lovegrass has demonstrated an incredible ability to thrive during wet, humid summers.

These characteristics, along with the ease of seed spread, have enabled African Lovegrass to cope better than many of our introduced and native grasses and we now find that African Lovegrass has established a foothold in many parts of Gippsland.

One of the significant challenges is the ease with which African Lovegrass is spread. The main vector being roadside management activities, where seed and plant contaminant can be transported large distances on machinery, equipment and vehicles. Improvements in hygiene practices to prevent the continued spread of African Lovegrass are fundamental if we are to realistically prevent the continued spread of African Lovegrass to other parts of Gippsland.

In addition, the need to continually inform and educate new landowners of the African Lovegrass issue is paramount, as is the need for the Gippsland community to take both individual and collective action to identify, manage and control African Lovegrass when sighted.

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About African Lovegrass

The plant and the problem

A native plant of southern Africa, African Lovegrass (*Eragrostis curvula*) is a spring/summer/autumn active growing perennial (C4) grass. As plants mature they form into large clumped tussocks.

African Lovegrass displays a high tolerance for low and erratic rainfall, being highly capable of persisting through dry seasonal and drought conditions. With these highly invasive characteristics, initial infestations of African Lovegrass typically occur in areas of disturbed soil, land of lower fertility, acidic sands and sandy loam soils.

Once established within an area, African Lovegrass poses a significant potential of further spread to all land types. If left untreated, African Lovegrass will form into a dense monoculture smothering out all other plant species.

African Lovegrass is a serious threat to areas of public land and areas of conservation significance. In particular African Lovegrass is considered a significant threat of native grasslands including the 'critically endangered - in imminent risk of extinction' Gippsland Red Gum Grassy Woodlands and associated Native Grassland vegetation communities.

With poor livestock palatability, African Lovegrass is also a serious threat to the invasion of productive agricultural farmland. Livestock utilisation of African Lovegrass is typically limited to springtime and early summer when young plants are in their green and active leaf growing stage.

The forage quality of African Lovegrass rapidly declines with plant maturity and carrying capacity of properties infested with African Lovegrass can be dramatically reduced if African Lovegrass is left untreated.

There is also evidence indicating that properties infested with African Lovegrass are being downgraded in property value.

Legal responsibilities for ALG management and control

African Lovegrass (*Eragrostis curvula*) is a declared noxious weed under the Catchment and Land Protection Act (CALP Act) 1994. Within the East and West Gippsland Catchment Management Authority Regions of Victoria, African Lovegrass was originally classified as a Regionally Prohibited weed.

As part of the noxious weed review process, African Lovegrass was reclassified to a Regionally Controlled weed in March of 2008 for both East Gippsland and West Gippsland.

Weeds classified as Regionally Controlled are weed species considered to be established within a region and to prevent their further growth and spread, continuing control measures are required.

Landowners both private and public have a legal responsibility to take all reasonable steps to control the growth and spread of Regionally Controlled weeds on their land and roadsides that adjoin their land. (Except where Vic Roads has responsibility for Declared Roads under the Transport Act 1983).

Description and identification

African Lovegrass (*Eragrostis curvula*) is a perennial grass plant that forms tussocks with maturity.

Description/appearance: Young plants are bright green / blue-green in colour with the distinguishing feature of African Lovegrass being its purplish-blue flower head (Inflorescence).

Height: can range from 20 - 120 cm dependant on plant maturity and growing environment.

Stems: are slender or robust, sometimes bent at the lower nodes, and develop in length up to 120 cm. Plants continually mown or slashed may also adopt stem growth of a horizontal habit.

Leaves: are dark green to blue-green in colour, with narrow blades to 3 mm wide and 25-35 cm long and narrowly tapering and often curled near the tips. Leaf margins are often folded or rolled inwards.

The basal sheath around the stem is yellowish or purplish, keeled and marked with striations. A conspicuous ring or beard of hairs occurs between the leaf blade and the sheath.

Flowers: are grey or leaden green, in groups of 4 to 13, 4 to 10 mm long and 1 to 1.5 mm wide. Flower heads vary from compact to loose, and form spreading panicles 6 to 30 cm long and up to 20 cm wide. Flower heads typically go through four stages of development, initial emergence, early opening, ripening and maturation.

Seeds: are creamy to dark orange or almost brown, 0.3 to 0.7mm long.

Roots: are typically fibrous and mainly occupy the upper 50cm of the soil profile.



Loose branched seed head

Seed heads branch out into a loose pyramid shape 6-30cm tall, with tiny seeds at the tips.



Weeping tussock growth

Plants grow as a densely tufted tussock with long, fine leaves which curl or 'weep' at the ends.



Finely serrated leaves

The leaves feel rough or 'sandpapery' if you run your finger along the edge, due to tiny serrations.



Hairs at leaf base

Where the leaf blade meets the stem there is a distinct ring of very fine white hairs, called a ligule.



Dense fibrous root system

Fine, tough roots form a dense fibrous root system down to 50cm which binds tightly to soil.

Identification in the field

The most prominent identifier of African Lovegrass in the paddock is the tall, open seed head which often stands above the native or introduced pastures of East Gippsland. Due to its unpalatability to stock, especially once mature, selective grazing can make plants and seed heads more prominent.

Relying solely on seed heads for identification means plants have already reached a reproductive stage. Developing the skill to recognise young plants earlier in the season helps ensure infestations are treated or removed before they can contribute new seeds to the soil bank. This means looking at the plants colour, and recognising the small, soft leaves of juvenile plants.

The colour of the plant is highly variable depending on its growth stage and the time of year. Recognising these colour transitions, from the striking green or blue-green of new growth to the leaden-grey of the seed heads, is essential for accurate year-round identification.

During summer when many common pasture grasses have yellowed off, ALG may retain its colour. It also responds to moisture faster than many desirable temperate pasture species, and exhibits a post-rain green-up making infestations highly visible against a dormant background.



YOUNG ALG PLANT



ACTIVE GROWING PLANT



STEM, LEAVES, FLOWER HEAD



ALG SEED HEADS AT DIFFERENT STAGES OF MATURITY



FIBROUS ROOT SYSTEM

Photo's by Darren Williams.

Characteristics and behaviour

Habit and lifecycle

African Lovegrass is a highly persistent, summer growing, warm season C4 grass species. As a C4 species of plant, African Lovegrass has a reduced transpiration rate, high temperature tolerance and high efficiency of photosynthesis.

Within Gippsland, African Lovegrass is known to have the potential to germinate, grow and flower at any time of year if provided with suitable climatic conditions.

Plant growth typically declines when temperatures reduce going into mid-late autumn and throughout the winter period. African Lovegrass plants are temperature and frost sensitive but remain alive to rejuvenate and respond as temperatures increase coming into early spring.

Typically African Lovegrass germination occurs in spring, over summer and early autumn when sufficient moisture and temperature exist and when temperatures exceed 10°C.

African Lovegrass seedlings have poor early vigour, and early seedling growth is relatively slow.

Flowering of African Lovegrass predominantly takes place during the warmer summer months and is intensified when hot and humid conditions are experienced. Flowering can occur year round if climatic conditions are favourable.

Given ideal growing conditions, African Lovegrass seedlings can develop a flower spike very rapidly. Germination typically takes 3-4 months but reshooting from inactive clumps may be much quicker. Flower heads typically go through four stages of development, initial emergence, early opening, ripening and maturation.

Reproduction

Seed formation in African Lovegrass does not require fertilisation and largely occurs through apomixes, a type of asexual reproduction. African Lovegrass can also spread vegetatively by tillering in response to plant disturbance.

The seed production capacity of African Lovegrass is estimated in the range of 600 kilograms per hectare with approximately 3.3 - 3.5 million seeds per kilogram. Seeds have an inherent dormancy, broken after 5 – 6 months. Most seeds will germinate within 7 days given favourable conditions.

African Lovegrass seedlings require temperature, moisture, light and space to germinate and establish. At this young germinate seedling stage; African Lovegrass plants are typically feeble and highly susceptibility making this one of the plants vulnerable attributes.

Seed germination is considered to decline somewhat with age, with seeds appearing to be relatively short-lived, perhaps due to a weak seed coat. Approximately 50% of ALG seeds in soil are viable at 5 years, and have been reported to remain viable for up to 17 years. Further investigation relating to the viability and longevity of African Lovegrass seed in Gippsland is required.

Given the ability of African Lovegrass plants to produce such large volumes of seed, any plant left untreated and allowed to set seed will rapidly replenish the soil seed bank.

Note: Management techniques to assist in stimulating the African Lovegrass soil seed bank are outlined within Section 3.

Modes of dispersal

African Lovegrass dispersal and spread predominantly occurs via vehicles, machinery and equipment with the movement, transportation and importation of contaminated soil or fodder. Once plants develop seeds, due to being small and light they are easily dispersed by wind to other areas.

In Gippsland, the prime vectors of African Lovegrass movement typically occur along roadside verges as a result of roadside management and maintenance activities, and areas of disturbed or degraded soil. Once African Lovegrass becomes established along roadside verges, it will then encroach onto adjacent farmland under prevailing winds.

Livestock movement is also a known contributor to African Lovegrass seed spread with seeds being carried on an animal's hide or in their gullets. Sheep are effective transporters of African Lovegrass with seeds easily becoming contaminated in fleeces, particularly when damp or dewy.

Any area of limited ground cover or where soil disturbance has occurred becomes more susceptible to infiltration and establishment of African Lovegrass. In farming situations, stock camp areas, tree and fence lines where stock have a tendency to congregate and soil disturbance occurs, are likely areas for establishment.

Vehicles and machinery



Hay and fodder



Livestock



Contaminated soil

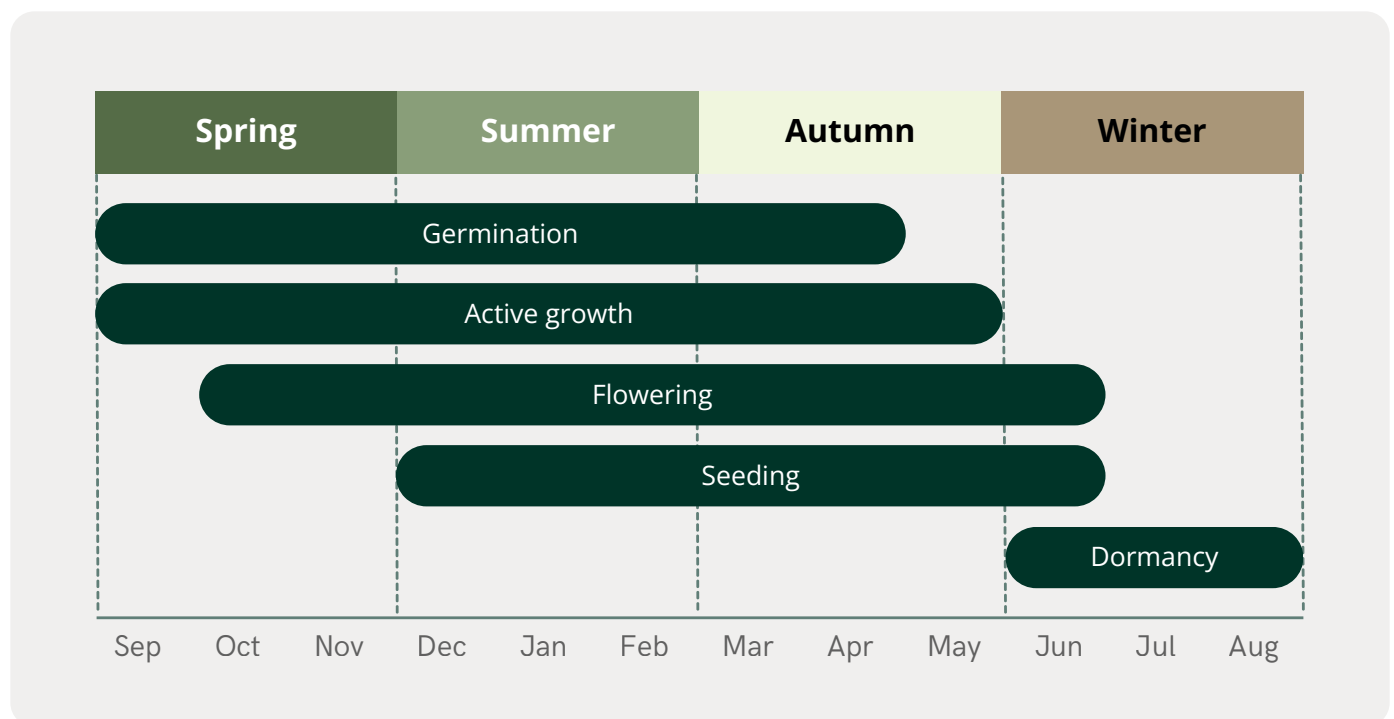


East Gippsland growth calendar

The growth cycle of African Lovegrass is dictated by local seasonal conditions.

Plants are dormant when soil temperatures are under 10°C. In southern Australia there are two main documented flush periods; Autumn and Spring.

Within the Gippsland region, African Lovegrass seed-set can occur year round when climatic conditions are favourable. Seeds are typically present on flowering heads and tending to ripen during the period from December – April. The growth cycle of African Lovegrass pertaining to the Gippsland Region is set out in the table below and represents the approximate times of year that African Lovegrass experiences; plant dormancy, germination, growth, flowering and seeding.



African Lovegrass has the ability to be very active in humid/wet conditions. Local experience suggests that plants can germinate and reach flowering stage very quickly. Continued vigilance for emerging plants is required during these conditions.

It should be noted that this is an approximate guide only, as Gippsland's varied climatic conditions make African Lovegrass behaviour just as unpredictable and erratic as Gippsland's weather.

Management and control

It is far cheaper and easier to prevent African Lovegrass invasion and establishment in the first place and to ensure that it is contained, managed and controlled within existing locations.

African Lovegrass is the perfect weed. It spreads quickly, grows and seeds fast, and survives in many soil types. Its only weakness is its seedling, which is not robust and can be outcompeted. There is no magic bullet, quick-fix solution, or one-off technique when it comes to managing, controlling, or attempting to eradicate African Lovegrass.

Management and control of African Lovegrass require a long-term strategy, a high level of vigilance, and persistent and sustained effort. In most African Lovegrass situations, a range of management techniques will need to be used in effective combination to provide an integrated weed management strategy for the paddock or property.

Total eradication of African Lovegrass in many situations may be an unrealistic expectation. Eradication of African Lovegrass suggests that every plant and seed within the soil will be removed.

Active management and control of African Lovegrass, with an objective of depleting the population to a level where ease of management and eventual control can be achieved would be seen as the most realistic and achievable strategy.

There are several fundamental management practices that will assist land managers in this task. In most situations, a range of integrated and best-practice management techniques must be used in effective combination to achieve the desired management and control results.

These integrated management strategies include:

- Tactical management strategies
- Prevention and avoidance
- Physical management and control
- Chemical management and control
- Cultural management and control

Integrated weed management (IWM)

The principle of IWM

Integrated weed management recognises that a single control measure undertaken on its own will not achieve the desired management results.

Integrated weed management considers and promotes a range of management techniques deployed in effective and successive combinations to target a weed's specific biological and behavioural features. This should be much more effective than a single mode of control. In particular, integrated weed management will aim to determine and target a weed's weakest links.

The most effective strategy for African Lovegrass management is preventing its spread and establishment in the first place. Where it is established the new seedling is less resilient and strategies should aim to provide plenty of competition to prevent successful establishment of new plants.

Integrated Weed management for African lovegrass for an individual property must include grazing management, competitive planting with summer active pasture species, appropriate removal methods (tactical, physical or chemical) and improved soil fertility to support desirable pasture species. Failure to establish and support alternative pasture species can result in bare soil where African Lovegrass seedlings can grow unimpeded.

Individual action and community coordination and cooperation to rapidly deal with any new outbreak of African Lovegrass, combined with localised and seasonal planning to prevent seed set, are critical.

This will require an informed, aware, knowledgeable, diligent, skilled, capable and confident community.

The training of Gippsland residents to ensure they have the appropriate skills to readily identify African Lovegrass and that they can deploy the appropriate management and control techniques as appropriate to each situation where African Lovegrass is found is also fundamental.

Community working together

Effective management and control of African Lovegrass in the Gippsland region require a community-led approach. To mitigate this invasive weed's impact, all local stakeholders, including residents, landholders, community groups, and government bodies, must collaborate and adopt a proactive stance toward weed management.

The weed's rapid spread poses a significant risk to various land use areas within Gippsland, making community awareness and involvement critical. Participants need to identify the weed, understand its behaviour, and engage in strategies to curb its growth and proliferation.

An appropriately resourced, comprehensive and sustainable control program is necessary, incorporating strategic planning with clear goals, ongoing stakeholder collaboration, and the use of effective control techniques, with an emphasis on good hygiene protocols and practices. This program should also include a framework for monitoring, evaluation, and adaptive management to ensure continual learning and improvement.

By adhering to these principles, the Gippsland community can effectively manage African Lovegrass, ensuring both immediate and long-term ecological health for the region.

Tactical management strategies

Prevent seed entry

The simplest way to reduce seed entry is to implement strict biosecurity protocols. This includes vehicle and machinery cleanliness, and establishing quarantine zones for new livestock. Regularly monitor high-traffic entry points like laneways, stockyards, and boundaries, and ensure all imported fodder or seed is certified weed-free before use.

Remove adult plants

The initial aim of any successful African Lovegrass management effort should firstly seek to remove all known existing adult or parent plants that are making a significant contribution to the African Lovegrass seed bank.

Typically large mature African Lovegrass plants are easy to kill with the challenge then being to actively manage and control the next succession of germinant plants that will emerge from the soil seed bank.

It is recommended that all infestation sites be revisited shortly after initial treatment works to ensure that any missed plants are re-treated.

Deplete the seed bank

Where African Lovegrass plants have been able to set seed in a particular area for some time, it is essential to implement a strategy that will assist to either neutralise or stimulate the African Lovegrass seed that remains stored in the soil profile.

Reducing or depleting the African Lovegrass, soil stored seed bank as early as possible in the control program, may reduce many years of active control there-after.

Neutralising of the soil seed bank may be achieved by either burning with an intense (hot) fire, or by treating the infestation area with a soil residual herbicide.

Treating infestations with a soil residual herbicide has the purpose of killing both the existing parent plants and killing the African Lovegrass seedling plants when they germinate.

Burning with an intense (hot) fire has the purpose of sterilising the African Lovegrass seed stored within the upper soil profile.

If burning is considered, plants should be chemically treated first with a knockdown herbicide to 'dry off' plants. The objective of this technique is to increase the fire intensity and to reduce potential plant regrowth vigour.

Stimulating the germination of the soil seed bank is another effective management strategy that can be deployed. The aim of this technique is to create a mass germination of African Lovegrass plants where control of new plants can then follow.

Techniques that can be used can include burning without prior herbicide treatment, or by undertaking a very light soil disturbance activity. (i.e. very light cultivation). These techniques will act to entice seed germination where a follow up herbicide treatment can then be undertaken when plants are at the green and active growing stage.

Prevent further seed set

Once adult or parent plants are removed and the soil seed bank reduced, all treated African Lovegrass areas may require continued monitoring and follow up control measures.

It is critical at this stage that any management strategy should aim to prevent plants from being able to set any further seed.

It is almost inevitable that some new germinant plants will emerge in treated areas after the initial treatment and potentially for consecutive years there-after.

If not revisited, plants left to develop and set seed will negate all earlier control efforts and financial outlay.

Improve soil fertility

As African Lovegrass readily establishes in degraded soils, it is important to implement an overarching plan to improve soil fertility and pasture competition. Without this, management activities will be ineffective over the long-term as ALG, and other weeds, will continue to re-establish in degraded or low-competition areas.

Prevention and avoidance

Maintaining adequate ground cover

Livestock grazing strategies should aim to prevent overgrazing and endeavour to maintain and promote a desirable level of ground cover year-round.

Plant species that mimic the growth habit of African Lovegrass (i.e. summer active) should be encouraged to provide maximum competition. These include kikuyu, summer active fescue and summer active variants of cocksfoot.

Preventing unnecessary soil disturbance

African Lovegrass is known to readily establish and colonise areas where soil disturbance or exposure has occurred or where other plant competition is sparse or non-existent. (Roadside verges are a good example of this).

Soil disturbance from earthmoving and associated activities is a significant vector for African Lovegrass invasion and establishment. If earthmoving or soil scalping activities are to be carried out, rehabilitation of the site should be carried out as promptly as possible to re-establish ground cover using a desirable and persistent plant species.

Overgrazed pastures where patches of soil become exposed especially during the summer months or during dry seasonal conditions is readily known to promote African Lovegrass and other weed establishment.

Establishing containment zones

Establishing containment or restriction zones can be applied at any level within the landscape. At the property level, paddocks can be managed in a manner to avoid African Lovegrass spread, neighbours can work together to prevent spread across farms and local communities can work cooperatively at the district level.

As many parts of Gippsland remain free from African Lovegrass, all endeavours should be applied to ensure that these areas remain that way. This requires adopting appropriate hygiene practices and containment strategies to ensure African Lovegrass is kept within its current geographical limits.

Good property and district hygiene

To either prevent African Lovegrass establishment or to contain its further spread, good property and district hygiene practices should be the first step in managing the threat posed by African Lovegrass.

Beneficial property and district hygiene protocols should include:

- Ensuring any vehicles, machinery and equipment that enter a property or district are free of weed seed or plant contaminants and have a single point of entry for vehicles.
- Confirming that any imported hay, fodder and seed is free of weed seed and if stock feed is imported, it should be fed out in a sacrifice or containment paddock and carefully monitored.
- Livestock purchases or sales should consider the potential for weed contamination/spread and livestock moved from property to property may also pose a risk of weed spread.
- If stock are brought, agisted or moved from one property to another, it is recommended that they be kept in a containment area either on arrival or departure from a property to ensure their hides and rumen can 'clean out' before having access to other parts of the property.

Vigilance

Regular monitoring for the emergence of African Lovegrass plants is possibly the most critical management strategy that individuals can adopt.

In particular, a heightened level of vigilance is required during the active growing period with even more regular vigilance required when hot and humid summer weather events are being experienced.

Early detection and rapid action

Early detection and rapid action to remove newly found African Lovegrass plants will also deliver time and cost effective results.

A community well equipped with African Lovegrass identification skills that can readily detect African Lovegrass plants and remove them by deploying the most appropriate control technique is critical. Any African Lovegrass plant sighted in new locations should be removed without hesitation and continued vigilance of that site should be maintained for consecutive years there-after.

Physical management

Manual plant removal is effective for isolated plants or small outbreaks.

Physical management and control of African Lovegrass describes a range of manual methods for removing African Lovegrass plants.

Typically, physical management is the use of hands or hand tools to remove African Lovegrass plants but may extend to other forms of control such as placing a mulch layer over plants or the use of fire.

Physical management and control of African Lovegrass typically includes one or more of the following techniques.

Hand pulling

Hand pulling of African Lovegrass plants can be a rapid and effective way to remove single or isolated African Lovegrass plants. This method provides a minimal disturbance method and is most effective in situations where plants have not had an opportunity to set seed in the area prior.

If plants have an active or ripe seed head on them they should either be removed first, or remove the entire plant very carefully so as not to dislodge seed whilst being placed in a plastic bag where they can be left in the sun to solarise or be burnt.

This manual approach is encouraged in advance of any herbicide treatment option in situations where minimal numbers of plants exist as the application of herbicide may lead to the creation of bare soils. Monitoring of the site should continue even when plants have been removed.



Hand pulling & hoeing

Rapid and effective for single plants and ensures the root system is removed.



Seed head removal

Use secateurs to remove and bag seed heads before uprooting the plant to reduce seed spread.



Solarisation

Bagged seeds or plants can be "cooked" in the sun. For maximum efficacy, use sealed black plastic bags.



Slashing/mowing

While it can improve palatability for intensive grazing, it carries a high risk of spreading seeds.



Burning

Fire can neutralise seeds in the upper soil profile or stimulate germination that can be treated with herbicide.

Chipping and hoeing

Similar to hand pulling, the use of a hand tool such as a hoe, shovel, mattock or pick is also an effective and quick way of removing African Lovegrass plants. This strategy is best applied in situations where African Lovegrass plants have not been able to set seed, and where they occur as individual or isolated groups of plants.

if plants have an active seed head, it may be wise to first remove the seed heads and place them into a bag where they can then be left in the sunlight to solarise and then be burnt. This manual approach is encouraged in advance of any herbicide treatment option where minimal numbers of plants exist, as the application of herbicide may promote the creation of bare soil.

Seed head removal & solarisation

In situations where individual or sparse African Lovegrass plants are found and if seed heads are nearing or at the mature stage, carefully remove the seed heads prior to removing the entire plant to prevent any opportunity of seeding.

A bag should be used to place the removed seed heads into and care should be taken not to dislodge mature seeds during the removal process, a process called solarisation. This hand removal of the seed head is again most relevant to situations where isolated plants occur and is not considered a time effective strategy for larger infestations.

It is essential to go back and remove the entire plant shortly afterward to prevent the plant developing further seed heads. Marking the locality of plants can assist to find them on return.

Mowing/slashing

Slashing or mowing can improve the palatability of plants by stimulating new growth. It may be appropriate in large infestations, but should be done when no seed heads are present to prevent further spread. Slashing should be followed up with other management activities.

Mulching

Mulching as a management technique for African Lovegrass could be applied in situations of small African Lovegrass infestations and would be most suitable in situations such as gardens or streetscape setting or as an organic management method.

Mulching could include the use of any material or product applied to cover and smother out active growing plants. To be most effective, re-vegetation of the area with desirable plant species should be followed up. It should be noted that this technique has not been widely used or trialled on African Lovegrass so further development and refinement of this technique is required and encouraged.

Burning

Fire can be a very important tool as part of integrated African Lovegrass management and is most effective when used in combination with other control tools. In particular, fire can be a very useful strategy in dense African Lovegrass situations to remove the plant biomass in order to allow ease of cultivation or assist follow up herbicide application.

Fire can also be a very effective tool in stimulating a mass germination of the African Lovegrass seed bank to promote green leaf growth. Stimulating a mass germination of new plants will provide an ideal opportunity for follow up with herbicide treatment.

If an intense fire can be achieved, burning can also assist to neutralise African Lovegrass seed stored in the upper soil profile, helping to run down the soil stored seed bank.

Fire should only be used in combination with other control methods as it will only further stimulate plant growth and create a denser and more vigorous infestation if not followed up by other control methods such as herbicide control or cultivation.

Note: Fire should not be used after an application of residual herbicide as fire will remove the residual herbicide effect from the soil. Always approach fire with caution and consult your neighbours, and local Country Fire Authority (CFA) Brigade.

Chemical management

Under an integrated strategy herbicides are used strategically, not exclusively, to manage infestations.

Management and control of African Lovegrass through the application of registered herbicides forms an important tool in the armoury to reduce the spread and growth of African Lovegrass in both natural environments and agricultural situations.

When used in combination, and as part of an integrated weed management program, herbicides form a key component of short to medium term African Lovegrass management and control.

In agricultural situations, herbicide treatment of African Lovegrass should be used to perform an effective and integrated role where follow up plant competition can then be established.

In natural environments, herbicide treatment can aid in preventing the further growth and spread of African Lovegrass enabling infestations to be managed and reduced over time. All herbicide control methods should be considered as part of a broader and fully integrated management and control strategy.

Reliance on herbicide management and control of African Lovegrass alone will not achieve the objective of replacing African Lovegrass with a more desirable plant species. It is essential that follow up works are carried out with any herbicide treatment to re-establish plants that will compete with and restrict the ability of African Lovegrass to re-establish.

With all herbicide treatment, correct calibration of the spraying equipment and herbicide mix is essential to prevent over spraying, or contributing to herbicide resistance if the incorrect formulation is used.



Spot spraying

Most effective for individual plants, margins, or small infestations. Use a coloured dye to avoid double-treating or missing plants.



Wick wiping

Blanket treatment by wiping herbicide onto tall ALG plants that sit above desirable pasture. Requires a height difference.



Boom spraying

Blanket treatment best for large, dense infestations. Must be accompanied by pasture renovation and oversowing.



Aerial & drone spraying

While more expensive than traditional methods, it does provide the ability for accurate pre-spray infestation mapping.

Spot spraying

Spot spraying describes the application of herbicides using a hand held application device (spray gun or wand) to apply herbicides to individual plants one at a time.

Hand gun or wand applicators typically provide a low pressure application rate with a range of variable or adjustable nozzles being available to modify the spray pattern and volume. Using selected nozzles and shields, can also assist to decrease the potential for off target treatment.

Spot spray applicators can either be carried by the operator as a hand held, carried as a back mounted pack or mounted on a quad bike, ute or trailer. Spot spraying is most suited to situations where individual or small groups of African Lovegrass plants occur.

The best method for spot spraying in a paddock situation is to work to a pre determined pattern to minimise the chance of missing or double spraying plants. Example patterns could be treating outlier plants first and then work inward toward the denser infestation, or working to a set grid pattern.

The operator needs to take care to ensure the herbicide is directed carefully to both the stem, leaf and base of African Lovegrass plants and ensure the entire plant is treated.

The use of a coloured dye added to the herbicide mix to provide a visual marker of treated plants is highly recommended in all spot spraying situations. This will hopefully alleviate potential plant misses or multiple treatments of the same plant.

In practice, spot spraying is best done at the time of weed detection, regardless of the season. In these scenarios it's better to kill it when you see it, rather than waiting for more growth, or more plants.

Boom spraying

Larger and denser infestations of African Lovegrass are best treated using a boom spraying application method if the site is accessible and safe for vehicular access. This application technique is most suitable for African Lovegrass in paddock situations or for longer linear areas. Careful calibration of equipment is required to ensure the correct volume of herbicide is applied to the treatment area.

Various spray nozzles are also available to produce the desired droplet size and the travel speed and volume of water required per hectare are also critical calculations. The potential for spray drift must be avoided by using low pressure nozzles and large droplet sizes. Herbicide application by boom spray must only take place in calm weather situations.

A guidance system such as a GPS, or foam marker is also encouraged to prevent against spray overlaps or strip misses.

In dense African Lovegrass infestation situations, a pre burn of the paddock could be considered as part of the integrated management program. Burning of large and dense African Lovegrass infestations in broad acre situations can aid the following:

- Reduced plant size allowing easier trafficking and visibility across the paddock
- Removal of excess plant dry matter decreasing the amount of herbicide required
- Stimulating green leaf growth to improve plant uptake of herbicides
- Stimulation and germination of the African Lovegrass seed bank
- Potential to sterilise the African Lovegrass seed that sits on the soil surface.

Follow up treatment along fence lines and other areas where the boom spray has missed or not accessed will need to be done by spot spraying. In broad acre situations, the user should also have a developed knowledge of the herbicide being applied and the composition and biology of co-existing plants within the area being treated.

Hygiene of the boom spray vehicle should also be taken into consideration as many African Lovegrass seeds can become lodged in vehicle parts whilst traversing across the infestation site.

Wick wiping

Wick wiping describes the application of herbicides via a device typically towed behind a vehicle that wipes or brushes applicators containing concentrated herbicide across the target plants. The two main devices being a ropewick and carpet roller.

Wick wiping should only be considered when there is a distinctive height differential between that of the targeted African Lovegrass plants and that of the desirable plants to be retained.

Pre grazing of the paddock to be treated is recommended but sufficient time should be allowed for the African Lovegrass plants to recover from the grazing stress.

Note:

It should be noted that only adult plants within a paddock will be treated with this technique as plants too short for the wick wiping application to reach will go untreated. Glyphosate is the recommended herbicide for this application technique.

Aerial application

In extreme African Lovegrass infestation situations, aerial application could be considered as a technique for herbicide application. Aerial application of any herbicide requires the engagement of a suitably qualified aerial spraying contractor and many regulations apply to this form of application technique.

This herbicide application method should be considered very carefully and fully researched. The cost of this method of application may also be prohibitive compared with the comparable large scale boom spray application method.

Drone spraying

Drone technology offer farmers a powerful tool for weed management and has made significant strides in detecting African lovegrass (ALG) in recent years, .

Advanced drones equipped with high-resolution cameras and multispectral sensors can now identify ALG with up to 98-99% accuracy, even in mixed grassland environments.

These drones can cover large areas quickly, mapping weed distributions at a rate that is far more efficient than traditional ground-based surveys. The technology allows for precise identification of ALG patches, enabling targeted treatment and reducing overall herbicide use.

While drone-based ALG detection offers numerous advantages, it's important for farmers to consider the cost-benefit ratio. Drone spraying services average about 34 AUD per hectare, compared to 11 AUD for traditional ground spraying.

However, the higher cost comes with benefits such as reduced soil compaction, ability to spray in wet conditions, and more precise application. Additionally, drone technology allows for pre-spray mapping and planning, which can lead to significant savings in herbicide use and improved efficacy of weed control efforts.

As the technology continues to evolve, it's becoming an increasingly valuable tool for farmers in their ongoing battle against ALG and other invasive weeds.

Herbicide granules

Some herbicides, including flupropanate and glyphosate, are available as granules. Granules can be effective in small patches or scattered infestations, where a whole batch of spray mix is not required.

Granules are applied by sprinkling ontop or at the base of the plant, where granules reach the soil. They are rain-activated, enter the soil at the plants root system, and are then absorbed by the plant.

Chemical management and control considerations

Applying herbicides safely

All herbicide users need to take care when storing, transporting, handling, using and disposing of herbicides to ensure the protection of their own personal safety, the safety of others, and the safety of the natural environment. All herbicides must be treated, handled and stored with extreme care.

When working with herbicides the user should be suitably skilled, trained or qualified, should carefully read and follow Directions of Use Labels and Material Safety Data Sheets (MSDS).

Material Safety Data Sheets (MSDS) can be found online to assist in safe and effective selection of herbicides and should be thoroughly read before herbicide use and located in an accessible place.

Herbicide users should also ensure that spraying equipment is in good working order, is appropriate for the situation for which it is to be used and that equipment is properly calibrated. An alternate option to applying herbicides yourself is to engage a suitably qualified and reputable herbicide spraying contractor.

Reputable contractors should be familiar and competent with herbicides and application methods suitable for controlling African Lovegrass, have equipment suited and appropriate to most African Lovegrass infestation situations and most importantly, be competent with African Lovegrass and general plant identification.

Key things to remember

- Herbicide exposure can cause adverse health effects
- Make yourself familiar with product Material Safety Data Sheets (MSDS)
- Select herbicides most suited to the required task and of least risk and always follow the manufacturer's instructions on herbicide handling, storage, usage and disposal
- Ensure you are suitably skilled and trained in the use of herbicides by attending a relevant training course or engage a suitably qualified and reputable herbicide spraying contractor if in doubt

Avoiding herbicide resistance

The development of herbicide resistance in weeds also needs to be considered when selecting and applying any herbicide. Resistance occurs when a plant that would normally be controlled by a herbicide survives the application of a usually lethal rate, and the change that caused the resistance is heritable.

If the change is heritable, it can be passed onto successive generations of the weed by seeds and if the same herbicide treatment is continued and resistant plants again reproduce, they will out-compete susceptible plants and become the dominant plant population.

Herbicides are now grouped by their 'mode of action' to allow herbicide resistance to be better managed. Interchanging between different 'mode of action' herbicide groups will assist to prevent resistance development.

Herbicides that have soil active characteristics that provide season long control have a moderately increased risk of resistance development.

Key things to remember:

- Always apply herbicides within the prescribed label rates
- Do not use herbicides as the sole control method (i.e. have an integrated control approach)
- Avoid over use of residual or soil active herbicides
- Rotate herbicide types that have different modes of action and follow up on any regrowing plants.

Infestation and site characteristics

The characteristics of an African Lovegrass infestation and site can greatly influence the options of herbicide selection and application technique. Factors such as infestation size and density, proximity to water bodies or significant vegetation, soil type, site topography and desirable plant species within the treatment area are all factors requiring careful consideration.

Timing of herbicide treatment

Treatment timing is typically influenced by the herbicide type being applied and the objective sought by the herbicide control program.

The two main herbicides typically used for African Lovegrass control in Gippsland (Glyphosate and Flupropanate) are absorbed by the plant in different ways and affect plant die off differently.

In considering these factors, their use is recommended and best applied at different times of year and in different control situations.

Herbicides with a soil residual mode of action take several months for plants to take up the herbicide via their roots so their use is recommended prior to the active growing season as seed set will most likely occur if applied too late.

If herbicides are applied during the active African Lovegrass growing season and the objective is to prevent seed set, a faster acting herbicide may need to be considered.

Selection of appropriate herbicides

Herbicide selection is greatly influenced by the control objective sought, or how the application of herbicides form part of the broader integrated management and control program.

It is very important that users do their research on the type of herbicide that will best perform the required task, whilst also presenting the least risk to the user and the environment.

The range of herbicide options and their particular functions should be well understood prior to purchase and application.

Application rates and technique

Any application of herbicide must be applied within the specifications as outlined on the product label. Application rates also need to take into consideration the objective for control, soil types and site aspect.

Application methods

A range of application methods are available for the herbicide treatment of African Lovegrass. Application methods will be influenced by factors such as the infestation scale and density, site access, proximity to water bodies and significant vegetation, labour requirements and associated treatment costs.

Herbicides currently registered for use on ALG

The Australian Pesticides and Veterinary Medicines Authority (APVMA) is an Australian Government statutory authority established to centralise the registration of all agricultural and veterinary herbicide products in the Australian marketplace.

Only certain herbicides are registered by the APVMA for the use on African Lovegrass in Victoria. From the current list of active herbicide constituents at the time of publishing this document, herbicides with the active constituents considered most suited to treating African Lovegrass in the Gippsland Region are Glyphosate and Flupropanate.

There has been considerable field experience in the use of both Glyphosate and Flupropanate for the control of African Lovegrass in Gippsland. Their usage has proven effective if applied as part of an integrated management program and in the correct situations.

The function, application methods, use and effect of these two active herbicide constituents for the control of African Lovegrass in Gippsland is further explained in the following pages.

To keep up to date with herbicide registration details and current permits visit the Australian Pesticides and Veterinary Medicines Authority (APVMA) Website at: www.apvma.gov.au

Feature	Flupropanate	Glyphosate
Primary Action	Slow-acting, systemic, and soil-residual.	Fast-acting, non-selective knockdown.
Absorption	Primarily through roots; needs rain to wash into soil.	Through leaves and stems, must be actively growing.
Visible Results	Very slow; complete die-off can take 3 to 18 months.	Quick; plant die-off typically occurs within 1 to 4 weeks.
Selectivity	Can be selective; some desirable grasses may recover after a setback, depending on application rate.	Non-selective; kills most green, actively growing plants it contacts.
Soil Residual	Remains active in the soil for 1–2 seasons to kill germinating seedlings.	No residual activity; does not prevent new seeds from germinating.
Best Timing	September to November to allow uptake before seed set.	Any time the plant is green, actively growing, and stress-free.
Key Risks	Can "bare out" sandy soils; long-term residue concerns.	Creates bare patches that invite new weed germination.
Brand names	Tussock, Surefire flupropanate and GP FluPro	Roundup, Nufarm Glyphosate, Weedmaster Duo.

Glyphosate

Glyphosate is 'non-selective' herbicides that kill annual and perennial weeds in certain situations and work by the plant absorbing the applied herbicide through green leaves and stems (Foliar absorption).

Glyphosate is generally quick acting and timing is best undertaken when plants are green, actively growing and free from stress. Plant die off typically occurs within one to four weeks after application. Glyphosate has no residual effect in the soil and no withholding periods apply.

Advantages

- Relatively affordable herbicide.
- Fast acting, killing parent plants and preventing seeding if applied prior to seed maturity.
- Has no withholding period.
- Can be followed up with cultivation, 7 days after initial application.

Considerations

- Best used in situations where follow up plant competition will be established as part of an integrated management program.
- As a 'non selective' herbicide it will impact on all green and actively growing plants within the treated area, therefore careful application is required to avoid off target impact.
- Will create a bare area and stimulate the germination of flat and annual weeds and allow further germination of the African Lovegrass seed bank if competition is not re-established.
- As glyphosate does not provide a soil residual effect, follow up control of the treated area is required several times per year, and for several consecutive years after initial treatment.
- The extensive fibrous root system may allow for regrowth after glyphosate application and is why follow-up treatment is crucial.
- Needs to be applied to active growing and stress free plants uniformly and correctly.
- Treated plants must not be disturbed until 7 days after initial application.
- If spraying in proximity to water bodies, a Glyphosate formulation registered for use in that situation is required.

Application

Glyphosate should be directly applied to African Lovegrass plant foliage in a uniform manner treating all green parts of the plant to the wet stage, but not to run off. Glyphosate can be applied by spot spray, boom spray, spray top and wick wiper application methods. The fibrous root system of African lovegrass (*Eragrostis curvula*) affects how glyphosate works on the plant in several ways:

Timing of application: Glyphosate is most effective when applied to actively growing plants in spring and summer when the plants metabolism is more active, allowing for better absorption of the herbicide.

Clean water: It is important to ensure that 'clean water' and water that is 'not hard' is used in herbicide mix solutions. Dirty or hard water can interfere with the cation exchange of certain herbicides and between herbicides and the plant. The result can lead to poor herbicide absorption and uptake by plants and reducing the overall efficacy.

Water stress impact: Under water stress conditions, the plant may not absorb the herbicide as effectively. Adding ammonium sulfate to glyphosate can improve its efficacy by increasing translocation.

Soil moisture considerations: The shallow root system means that herbicide application during dry winters or severe droughts may result in poor control.

Additives: Including an additive such as Ammonium Sulphate to water can assist in binding iron and calcium cations that are present in both water and plant cells aiding to improve control success.

Key messages regarding the use of Glyphosate for African Lovegrass management and control:

- If Glyphosate is to be used, it should be recognised that they can form an important role in the short term management and control regime of African Lovegrass but only where the establishment of more desirable plant competition follows.
- Glyphosate lends itself well to situations where integrated management activities such as burning and fodder/forage crop establishment is then undertaken.

Flupropanate

Flupropanate is typically slow acting with herbicide uptake predominantly being through plant root absorption. Flupropanate has soil residual properties, and some selective attributes.

The duration of the residual benefits of Flupropanate is influenced by soil type, and rainfall after application.

Local experience suggests that Flupropanate may have a shorter residual effect in light sandy textured soils most likely as a result of the herbicide having a higher likelihood of leaching.

Plant die off time after the treatment with Flupropanate varies and is influenced by soil type, soil moisture and subsequent rainfall after application. Complete die off time for some mature plants may take between 3-18 months.

Advantages

- Depending on soil type, rainfall and seasonal conditions, the residual effect of Flupropanate can help to prevent consecutive seasonal germination of African Lovegrass.
- When applied with an understanding of co-existing plant species, can be used to assist to encourage desirable plant competition.
- When applied by Boom Spray application method, Flupropanate can control African Lovegrass seedlings usually missed by the spot spraying method whilst also providing control of new emergent seedlings.

Considerations

- Flupropanate is 'slow acting' and plant die off can take 3-18 months.
- An understanding of the co-existing plant species within the treated area is required to determine the most appropriate time for application, typically when the desirable species are dormant.
- Burning areas treated with Flupropanate will negatively impact on the benefits of the herbicides residual properties.
- Flupropanate has strict withholding periods that need to be adhered to and should not be used near waterways or lactating stock producing milk for human consumption.
- Over use or over application of Flupropanate can bare out soils.

Application

Flupropanate can be applied by spot spray and boom spray application methods, the herbicide is primarily absorbed through the root system. Specific application rates need to consider the soil type of the area to be treated; local experience suggests light sandy soils require lesser label rates.

To prevent plants setting seed, treatment should be considered a minimum of 3 months prior to when plants are likely to produce seed head. Therefore in Gippsland, application is recommended between the months of September to November to coincide with the early stages of plant growth.

Flupropanate also has specified withholding periods and the directions of use label must be strictly adhered to. 100 mm of leaching rainfall is also required prior to re-seeding any treated area with a competitive pasture.

Plant species known to be susceptible to Flupropanate include legumes, particularly young subterranean clover, weeping grass, wallaby grass and spear grass. Species that may be affected or set back by Flupropanate include phalaris, kikuyu, cocksfoot, tall fescue, kangaroo grass, redleg grass and silver tussock but these species should fully recover after some initial set back depending on rate of application.

Key messages regarding the use of Flupropanate for African Lovegrass management and control

- Flupropanate has residual effects and can aid in the control of successive germinations of African Lovegrass seedlings.
- Flupropanate is slow acting and a visible effect on established plants can range from 3-18 months, influenced by soil type, soil moisture content and seasonal factors
- Soil types can influence the application rate required, i.e. light soils may require lesser label rates, heavier soils may require higher label rates and paddock trials are encouraged.
- Avoid the over treatment of the same area to minimise the risks of baring out soils and developing herbicide resistance.
- Avoid use near water ways and lactating stock.
- 100 mm of leaching rainfall is required prior to re-seeding treated areas with competitive pasture.

Glyphosate/Flupropanate mix

Flupropanate can also be combined with Glyphosate to enhance plant die off time whilst also achieving some soil residual benefits for the control of germinant seedlings.

The combined effect of the two herbicides when incorporated together can be an effective strategy when treating African Lovegrass plants nearing the seed maturity stage. (Typically being December – March)

Mixing of Flupropanate with Glyphosate will negate the selectivity benefits that Flupropanate provide if used on their own.

In addition, mixing Glyphosate with Flupropanate may affect the kill rate and residual efficacy that Flupropanate would otherwise provide if used alone.

Advantages

- Achieves a quick plant die off whilst giving some soil residual effect for control of African Lovegrass seedling germinates, therefore suited to treating plants in mid to late seed set.

Considerations

- Will negate any selective benefits and reduce soil residual efficacy that Flupropanate would provide if used alone.
- The withholding period as per Flupropanate still apply.

Application

The use of clean water and additives to assist herbicide efficacy are important to ensure effective results from the use of Glyphosate/Flupropanate mix.

Clean water: It is important to ensure that 'clean water' and water that is 'not hard' is used in herbicide mix solutions.

Dirty or hard water can interfere with the cation exchange of certain herbicides and between herbicides and the plant.

The result can lead to poor herbicide absorption and uptake by plants and reducing the overall efficacy.

Additives: Including an additive such as Ammonium Sulphate to water can assist in binding iron and calcium cations that are present in both water and plant cells aiding to improve control success.



Cultural management

Improving whole farm management practices can prevent weeds from establishing infestations.

Under an integrated management approach, improving whole-farm management, or using cultural management practices as part of a pasture renovation regime can support long-term reduction in weed infestations.

The best prevention strategy for African Lovegrass is to ensure existing and desirable plants are able to grow healthily and vigorously so as to provide a competitive barrier to African Lovegrass infiltration.

As African Lovegrass seedlings have poor early vigour and require space and light to grow, they struggle to establish and survive in situations where competition exists.

Plant species that have an active summer growing habit should be encouraged for areas at risk of African Lovegrass invasion and the maintenance of desirable ground coverage, in particular during dry seasonal conditions is critical.

Active summer growing plant species that mimic or surpass the growth cycle of African Lovegrass and that provide a more palatable option should be fully explored and their growth and establishment encouraged along with increased soil fertility.

Species such as kikuyu, lucerne, cocksfoot, phalaris, and fescues are some of the plant species identified as meeting these criteria.



Maintain ground cover

Maintain year-round ground cover and ensure any bare patches are re-established with competitive pasture.



Pasture competition

Encourage summer-active species to mimic and outcompete ALG and re-establish ground cover in infested area.



Grazing management

Rotational grazing allows desirable plants to recover and avoids creating bare patches from overgrazing.



Biosecurity

Implementing and maintaining farm biosecurity measures reduces the chance of new seed entry or spread.



Pasture renovation

Complete pasture renovation and maintenance including application of fertiliser and/or urea.

Pasture renovation

With any pasture renovation exercise, historical rainfall patterns and weather outlook forecasts need to be taken into consideration as part of the pre-sowing planning to ensure any potential rainfall opportunity is maximised.

Your local agronomist should also be involved in determining the best perennial pasture species mix suited to your particular site.

The best prevention strategy for African Lovegrass is to ensure existing and desirable plants are able to grow healthy and vigorously so as to provide a competitive barrier to African Lovegrass infiltration. As African Lovegrass seedlings have poor early vigour and require space and light to grow, they struggle to establish and survive in situations where competition exists.

Plant species that have an active summer growing habit should be encouraged for areas at risk of African Lovegrass invasion and the maintenance of desirable ground coverage, in particular during dry seasonal conditions is critical. Likewise, the best rehabilitation strategy for areas infested with African Lovegrass is to re-establish more desirable plant species that will take or occupy the place of the more undesirable African Lovegrass plant.

Active summer growing plant species that mimic or surpass the growth cycle of African Lovegrass and that provide a more palatable option should be fully explored and their growth and establishment encouraged. Species such as kikuyu, lucerne, cocksfoot, phalaris, and fescues are some of the plant species identified as meeting these criteria.

Perennial pasture based plants should be allowed to set seed in their first year and then require resting for their first spring and summer with intermittent and light grazing being able to occur during the autumn and winter phase of the second year.

An application of fertiliser during the autumn can be considered to encourage and stimulate legume growth. After the second summer rest period, perennial pastures should be grazed under a strategic rotational grazing system to maximise plant development, avoid overgrazing and to manage stock being plant biased in their grazing selection.

Grazing management

Grazing management should be used in combination with the other physical, cultural, and chemical management techniques, and as a follow-on activity from re-establishing strong pasture competition.

The foundational consideration is managing the stocking rate, the number of animals on a specific area of land over a given time, to prevent overgrazing, which depletes root reserves, and undergrazing, which leads to wasted, overgrown forage.

To combat this, producers use rotational grazing where livestock are systematically moved through these paddocks, allowing grazed plants a crucial rest and recovery period to regrow vigorously. Combining these strategies with routine assessments of residual forage height ensures soil coverage is maintained to prevent weeds from establishing.

Biosecurity

Implementing best practice biosecurity measures is the most effective way to prevent regional spread. Establishing a procedure for people visiting your farm can significantly reduce the spread of weeds onto, within, and from your property.

Key items on a farm biosecurity checklist include:

- Identify weeds that are an infestation risk.
- Identify and map existing weed infestations and update with new outbreaks.
- Establish dedicated vehicle tracks and parking.
- Ensure vehicles and machinery are blown or hosed down on entry and exit.
- Check undercarriage, blades, and tyres for visible seeds or stems.
- Establish a quarantine paddock to hold new stock for at least 10 days.
- Identify and monitor entry points such as roadsides, laneways, and waterways.
- Undertake frequent boundary checks, especially windward boundaries.
- Limit soil disturbance and re-seed disturbed soil immediately.
- Buy weed free hay and feed, and request a Commodity Vendor Declaration.
- Regularly review and monitor your property and hygiene practices.

Maintain ground cover

A range of factors contribute toward maintaining a desirable level of ground cover including soil nutrients, diversity of plant species and plant growth vigour.

Fortunately each of these factors can be manipulated and managed to minimise the risk of African Lovegrass invasion.

A pasture comprised of perennial, annual and legume species with access to required nutrients and grazed under a rotational grazing pattern that allows plants to have the required rest and recovery period is considered optimum.

Grazing management plays a critical role in maintaining ground cover as overgrazing can result in the depletion of desirable plant species, the favoured recruitment of less desirable plant species, reduced ground cover and the creation of bare areas that become susceptible to African Lovegrass invasion.

In particular, excessive grazing pressure during hot summers and dry seasonal conditions can have a significant and detrimental effect on ground cover.

Grazing strategies that seek to maintain a good level of ground cover and consistent, more even balance of pasture utilisation is encouraged.

Pasture competition

In situations where medium to dense African Lovegrass infestations have existed, after initial herbicide control has occurred, a series of short term rotational fodder/forage crops is recommended as an important follow up step in the integrated management program to rapidly re-establish plant competition.

Adopting a regime of short term rotational fodder/forage cropping will assist to further exhaust the African Lovegrass seed bank and improve soil fertility; both important strategies prior to considering the establishment of more permanent (perennial) pastures.

As African Lovegrass is a summer active (C4) growing plant, a spring sown fodder/forage competitor crop that has a vigorous summer active growing habit is encouraged. To achieve an effective seasonal rotation an autumn sown winter fodder/forage crop should follow.

Advice from a local agronomist is recommended in regards to selecting the most suitable crop varieties best suited to your particular localised conditions and whether additional cropping needs to be undertaken. 2-3 years of consecutive cropping may be required and determining the number of year to crop.

Soil testing of paddocks to be treated is recommended prior to undertaking any re-establishment works to ensure the required competitor plants have access to the available nutrients required for healthy and vigorous growth.

After establishment, an appropriate grazing and fertiliser regime is required to maintain both the longevity and vigour of established crops.

Any renovated African Lovegrass paddock should be vigilantly monitored for any signs of re-emergent African Lovegrass plants. Newly identified ALG plants should be immediately removed.

The advantages of implementing a fodder/forage cropping regime will allow for follow up herbicide treatment to be undertaken without significantly or adversely affecting the rotational cropping program.

When the African Lovegrass seed bank appears to have been exhausted as a result of consecutive rotational fodder/forage crops, the re-establishment of a perennial (permanent) pasture can be considered.

If an autumn sowing is undertaken, newly established plants will need to have the opportunity to develop their root system before light grazing should occur.

Plant root development can be tested by hand pulling of plants. If plants are difficult to dislodge, root development is considered sufficient for grazing to proceed. If plants are under moisture stress at this stage, grazing should be deferred.

An initial light/quick grazing will aid to stimulate new leaf (tiller) development and further root growth, but care needs to be taken to avoid over grazing at this early growth stage.

Management situations

Land use situations

To assist land managers within the Gippsland region in selecting the most appropriate African Lovegrass management and control techniques, a series of typical land use situations and infestation scenarios have been identified.

The common land use situations where African Lovegrass management and control may be required are defined under the following headings:

Farmland

- Introduced pastures in degraded condition
- Introduced pastures in reasonable to good condition
- Native based pastures

Conservation areas and nature reserves

- High value conservation areas
- Degraded conservation areas

Roadsides and utility easements

- High value conservation roadside and utility easements
- Degraded roadside and utility easements

Urban and semi urban environments

- Nature strips and recreational areas

In each of these land use situations the density and maturity of an African Lovegrass infestation greatly influences the selection of the most appropriate management and control technique.

Infestation descriptors

A set of descriptors for the various densities of African Lovegrass infestations has also been established to provide further guidance for selecting the most appropriate treatment technique for both the land use situation and African Lovegrass infestation density.

Newly emerged plants

Describes a newly germinated African Lovegrass plant or several plants that have not been seen in an area before and that have not yet been known to set seed.

Scattered plants – established

Describes a scattering of individual African Lovegrass plants that have already set seed.

Small infestation – established

Describes a group of African Lovegrass plants that have previously set seed over a period of years and have been able to form closed patches or clumps. There may be several patches or clumps across a given area.

Medium density of spread

Describes an African Lovegrass infestation that has seeded over many years in an area and where individual plants and clumps of plants exist throughout the infested area.

Dense sward

Describes an African Lovegrass infestation that covers an entire area with little to no uninfested ground remaining.

Land use descriptions

Land use	Situation	Description
Farmland	Introduced pastures in degraded condition	Pastures with a predominant base of introduced plant species that are mostly comprised of annuals and flat weeds and interspersed with patches of bare ground.
	Introduced pastures in reasonable to good condition	Pastures comprised of introduced species with good ground coverage and dry matter production. Very little bare ground is detectable.
	Native pastures	Pastures comprised predominantly of native grasses and forbs. Indicator species might include kangaroo grass, spear grass, weeping grass, wallaby grass etc.
Conservation areas and natural reserves	High value conservation areas	These areas contain significant examples of remaining remnant native vegetation and flora and fauna species of ecological significance and importance. Can be comprised of either over-storey trees and shrubs or inclusive of grasses and forbs or a combination of all species. Areas may be under protection by either State or Commonwealth legislation.
	Degraded conservation areas	Areas containing native remnant vegetation being comprised of either over-storey trees and shrubs or inclusive of grasses and forbs or a combination of all species. These areas may display some evidence of human disturbance and have an existing level of invasion from introduced grasses and weeds including African Lovegrass.
Roadsides and utility easements	High value conservation roadsides and utility easements	Roadside verges and utility easements containing significant examples of remnant native vegetation and flora and fauna species of ecological significance.
	Degraded roadsides and utility easement areas	Roadside verges and utility easements displaying visual signs of human disturbance and containing introduced grasses and weed invasion including African Lovegrass.
Urban environments	Nature strips and recreational areas	Areas of land located within built up residential settings that include nature strips, sporting and recreational reserves, roadside verges, neglected and vacant land allotments and industrial areas.

Management and control in farmland

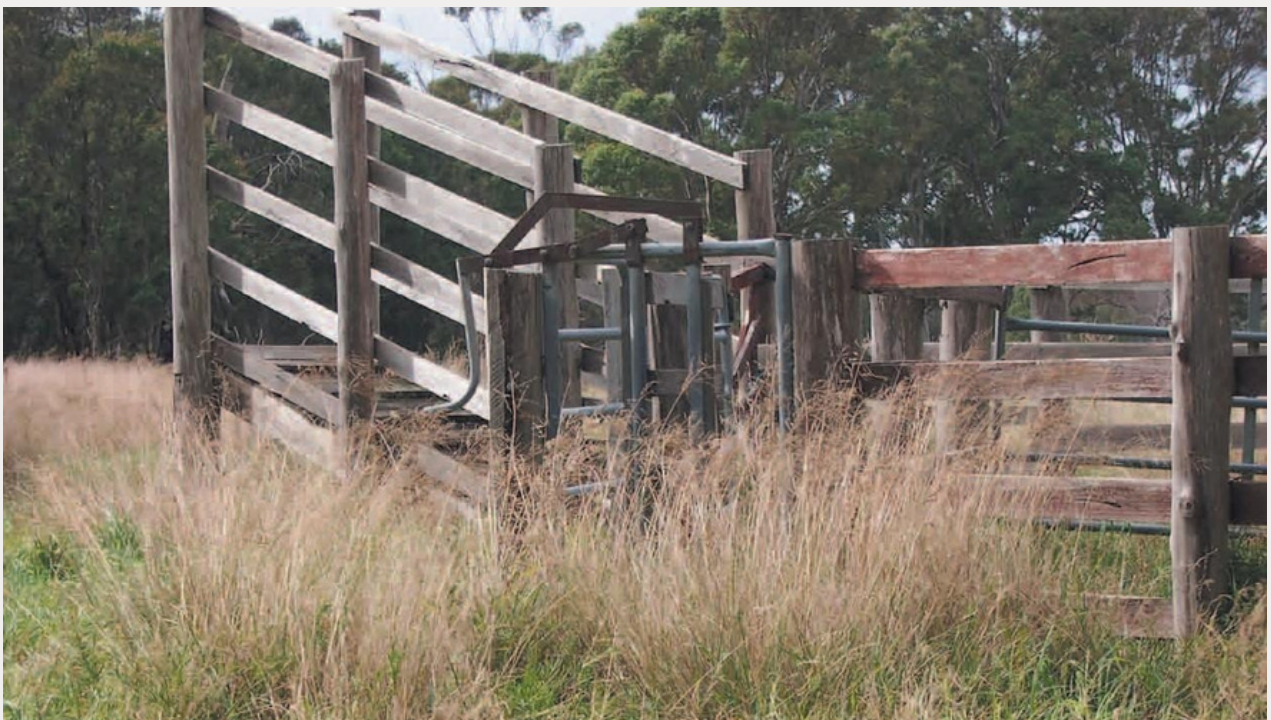
The management and control of African Lovegrass in farmland situations will require a range of different and integrated management techniques to be deployed.

The choice of integrated techniques will be dependent on the particular situation in which the African Lovegrass infestation occurs. Replacing African Lovegrass plants with a more desirable and palatable plant should ultimately be the desired objective for any African Lovegrass management and control program in farmland situations.

The following three tables outline the recommended management and control practices believed most effective to manage, control and out-compete African Lovegrass in farmland situations.

General management and control strategies

- Preventing unnecessary soils disturbance and exposure and maintaining adequate ground cover
- Following good property and district hygiene practices
- Establishing containment or restriction zones
- Maintaining a heightened vigilance for early detection and rapid action
- Removal of adult plants
- Seed bank depletion/reduction
- Preventing further seed set
- Establishing or promoting competition



Introduced pastures in degraded condition

Infestation type	Management approach
Newly established plants	In situations where a paddock or paddocks are considered to be in a degraded or poor condition, further infiltration and establishment of African Lovegrass is likely. Regardless of the African Lovegrass infestation extent in these situations, the recommended management and control strategy is for a ground cover improvement program to be undertaken.
Scattered plants	The aim of a ground cover improvement program is to re-establish a more vigorous and healthy pasture base with the aim of providing a competitive barrier to African Lovegrass establishment and growth. Improved paddock productivity will also be achieved. There are two main options recommended for managing and controlling African Lovegrass in degraded pasture situations.
Small patches	1. An autumn and spring cultivation and forage/fodder cropping program incorporating a blanket herbicide treatment using Glyphosate applied by boom spray application method. • This strategy should be carried out over consecutive seasons whilst also incorporating required fertilisers based on soil test recommendations. • When confident the African Lovegrass seed bank has been run down, the paddock/s should then be sown to a competitive and suitable perennial pasture.
Medium density of spread	• Allow the new pasture to establish and set seed in the first year and maintain a close vigilance for any emergent African Lovegrass plants. If sighted, remove by hand (in medium to dense African Lovegrass situations, burning of the infestation is recommended). 2. Treat the paddock with Flupropanate in late winter, early spring by boom spray application method. This will act to provide a residual control of the African Lovegrass seed bank for consecutive years.
Dense swards	• Follow this treatment up with an additional knock down herbicide treatment with Glyphosate by boom spray application method in early Autumn then direct drill to a competitive perennial pasture base after 100 mm of leaching rain. Again, apply required fertilisers based on soil test recommendations. • Allow the pasture to establish and maintain a close vigilance for any emergent African Lovegrass plants.

Introduced pastures in reasonable to good condition

Infestation type	Management approach
Newly established plants	Hand removal of newly emerged African Lovegrass plants is recommended for this situation to achieve minimal disturbance. Care should be taken not to dislodge seed heads and removed plants solarised in a plastic bag and then burnt.
Scattered plants	Hand removal of lightly scattered African Lovegrass plants is again recommended. In situations where it is felt that the African Lovegrass infestation is considered beyond the stage of hand removal, a spot spraying application method using Flupropanate is suggested. Treatment should be undertaken between the months of September – November allowing plants the best opportunity to take up the herbicide via root absorption. The aim of this technique is to prevent the African Lovegrass plants from reaching the seed set stage, to kill plants prior to the next growing season and to establish a residual control of germinant seedlings. As a last resort technique for control of African Lovegrass plants during the active growing season, a spot spraying application method using Flupropanate mixed with Glyphosate is suggested. It should be noted that this mix of herbicides will negate any selective benefits and also potentially reduce residual efficacy and control of germinant seedlings.
Small patches	Generally African Lovegrass infestations are not typically found to extend beyond the scattered plant scenario where a reasonable to good pasture base exists. If African Lovegrass was to be found in this situation, treatment with Flupropanate by boom spray application is recommended. Timing of treatment is recommended between the months of September – November.
Medium density of spread	
Dense swards	

Native pastures

Infestation type	Management approach
Newly established plants	Hand removal of newly emerged African Lovegrass plants is recommended for this situation to ensure minimal disturbance. Again, care should be taken not to dislodge seed heads and removed plants should be solarised in a plastic bag and burnt.
Scattered plants	Hand removal of newly emerged African Lovegrass plants is recommended where plants are found lightly scattered within a paddock to ensure that least disturbance occurs. Where it is felt the African Lovegrass is beyond the stage of hand removal, spot spraying can be considered. Flupropanate is recommended and treatment should be undertaken when the dominant native plants within the paddock are at their most dormant stage. Again as a last resort technique, if spot spraying is required during the active African Lovegrass growing period, a herbicide mix of Glyphosate and Flupropanate is recommended to achieve quick plant die off and to provide some residual effect. In all spot spraying situations, careful application is required to minimise over spraying to avoid off target treatment.
Small patches	Careful spot spraying with Flupropanate is recommended in this situation and treatment should be undertaken when the dominant native plants within the paddock are at their most dormant stage. If spot spraying is required during the active growing period, a herbicide mix of Glyphosate and Flupropanate is recommended to achieve quick plant die off and to provide some residual effect. Careful application is required to minimise over spraying to avoid off target treatment.
Medium density of spread	Any benefits of a native pasture base will have been compromised with an African Lovegrass infestation at this density.
Dense swards	If livestock production is the primary objective of the landholder the recommended African Lovegrass management and control strategy in this situation is for a ground cover improvement program to be undertaken as per the recommendations for the degraded pasture scenario. Where livestock production is not the primary objective of the landholder, management options to consider could include rehabilitation of the site for conservation purposes or establishment of Agroforestry. Several tree and shrub species, in particular species of Acacia display allelopathic characteristics that limit the germination ability of African Lovegrass. As the growth and spread of African Lovegrass can also be deterred by shade, the establishment of a canopy cover provided by over storey tree species may also assist to inhibit the growth and spread of African Lovegrass. Advice on rehabilitating areas for conservation and biodiversity purposes can be obtained from organisations such as the Gippsland Plains Conservation Management Network, Trust For Nature and Landcare.

Conservation areas and nature reserves

African Lovegrass poses a significant invasion threat of native grasslands. On the Red Gum Plains, African Lovegrass is of particular concern due to its potential to invade a vegetation community listed as 'critically endangered - in imminent risk of extinction', the Gippsland Red Gum Grassy Woodlands and associated Native Grasslands.

This vegetation community is restricted to the area between Swan Reach and Traralgon, the same geographical area where African Lovegrass presently occurs.

Conservation and nature reserve areas are typically remaining remnants of original vegetation communities and the exclusion of African Lovegrass from these areas is critical to ensure their integrity is protected and retained.

General management and control strategies

- Determine the ecological significance of conservation and nature reserve areas
- Identify and map the African Lovegrass presence and potential threat to each particular site
- Be conscious to prevent or minimise any further disturbance of the site with any treatment activities
- If applying herbicides, minimise the potential risk of overspray by correct nozzle selection and careful application techniques, but hand removal should be performed in preference to herbicide treatment methods if possible.

Infestation type	Management approach
Newly established plants	Hand removal of plants can be an effective option when newly emerged African Lovegrass plants are sighted particularly in areas of high conservation importance. This can be an effective technique particularly if plants have not yet set seed.
Scattered plants	In conservation and nature reserve areas where scattered individual African Lovegrass plants or small groups of plants are found, management and control can be carried out either by hand removal or by careful and targeted spot spraying with Flupropanate. Application needs to be undertaken when the dominant native species present within the site are at their most dormant stage.
Small patches	Careful and targeted spot spraying with Flupropanate is recommended in this situation. Application needs to be undertaken when the dominant native species present within the site are at their most dormant stage with correct nozzle selection and careful application required to minimise the potential risk of overspray and off target damage.
Medium density of spread	The development of a site rehabilitation plan is recommended when an African Lovegrass infestation becomes dominant in an area of conservation importance. Rehabilitation plans will need to be considerate of the site's conservation status and significant flora and fauna values of the site.
Dense swards	

Roadsides and utility easements

The continued and further spread of African Lovegrass across the Gippsland Region is at most risk as result of roadside maintenance and management activities.

Utility easements are also of significant concern given the fact that vehicles and machinery traversing these easements have the potential to spread African Lovegrass over large distances as a result of inspection vehicles and maintenance equipment machinery moving in and between these areas.

The following best practice strategies should be considered for the management and control of African Lovegrass for roadside and utility easement situations in both degraded and high conservation value areas.

In high conservation value locations, additional care is required to avoid and prevent off target impacts of control activities.

General management and control strategies

- Map the locality of African Lovegrass infestation areas and determine each site's conservation values
- Based on infestation knowledge, develop a hygiene strategy to contain African Lovegrass within present limits with the intent to prevent further growth and spread
- Ensure staff and contractors are trained in the identification and management of African Lovegrass and that they adopt appropriate machinery and vehicle hygiene protocols
- Avoid slashing of roadsides and utility easements in African Lovegrass infestation areas
- Ensure soil disturbance activities are kept to a minimum and that any disturbed areas are rehabilitated as promptly as possible

Infestation type	Management approach
Newly established plants	During the active African Lovegrass growing season, careful and targeted herbicide application using a Glyphosate/Flupropanate mix by spot spraying method should be used to control newly emerged African Lovegrass plants.
Scattered plants	Careful targeted herbicide application by spot spraying method using Flupropanate is recommended with treatment recommended between the months of September - November.
Small patches	
Medium density of spread	African Lovegrass infestations along roadsides and within utility easements are typically comprised of plants having a linear pattern of spread.
Dense swards	In situations where medium to large swards are identified, the option of a boom spray method of application using Flupropanate could be considered. In native grassland situations, timing of treatment would need to be undertaken when the dominant native species are at their most dormant stage.

Urban and semi-urban environments

There is an increasing prevalence of African Lovegrass within urban and semi urban areas within the Gippsland Region. Once established, the potential for continued spread can be exacerbated by activities such as mowing and slashing and the disturbance and movement of soil.

Local Government laws require grass to be maintained for fire prevention purposes. These regular slashing and mowing regimes can increase the opportunity for further African Lovegrass spread.

Management regimes that strive to prevent African Lovegrass seed spread is critical and all slashing and mowing contractors should be trained and skilled in African Lovegrass identification and adopt appropriate hygiene management practices.

General management and control strategies

- Map the locality of African Lovegrass infestations
- Develop community identification skills of African Lovegrass in urban and semi urban areas
- Conduct training for Local Government parks and gardens staff and contractors
- Prevent the mowing and slashing of African Lovegrass plants containing viable seed
- Minimise soil disturbance and promptly rehabilitate areas after completion of works
- Treat infested recreational areas and nature strips
- Mulching should be trialled to determine its effectiveness as a management technique

Infestation type	Management approach
Newly established plants	During the active African Lovegrass growing season, careful and targeted herbicide application using a Glyphosate/Flupropanate mix by spot spraying method should be used to control newly emerged African Lovegrass plants.
Scattered plants	Careful targeted herbicide application by spot spraying method using Flupropanate is recommended with treatment recommended between the months of September - November.
Small patches	Careful targeted herbicide application by spot spraying method using Flupropanate b is recommended with treatment recommended between the months of September - November. In nature strip areas mulching could also be trialled.
Medium density of spread	In situations where medium to large swards are identified the application of Flupropanate should be considered. Where native grasses dominate, timing of treatment would need to be undertaken when the most dominant native species is at its most dormant stage.
Dense swards	

ALG management summary table

Land use	Farmland			Conservation areas and nature reserves		Roadsides and utility easements	Urban
Infestation type	Introduced degraded pastures	Introduce perennial pastures	Native pastures	Degraded areas	High value areas	All area types	
<i>Newly established</i>	Manual removal or spot spray	Manual removal		Manual removal		Manual removal or spot spray	
<i>Scattered plants</i>	Manual removal and solarisation or spot spray			Manual removal and solarisation or spot spray		Spot spray	
<i>Small patches</i>	Boom spray and full pasture renovation including fertiliser and oversowing	Spot spray or boom spray	Spot spray	Spot spray		Spot spray	Spot spray or mulch
<i>Medium density</i>		Boom spray and fertiliser to improve ground cover	Boom spray and improve biodiversity or agroforestry	Spot spray	Biodiversity restoration to choke out	Spot or boom spray	Boom spray and improve ground cover or fertilise
<i>Severe infestation</i>				Biodiversity restoration		Boom spray	

Experience from the field

Background

The introduction of African Lovegrass (*Eragrostis curvula*) into the Gippsland landscape has transformed from a historic pastoral experiment into one of the most persistent biosecurity threats to local agricultural productivity and native ecosystems.

Highly adapted to harsh climates, this warm-season perennial grass thrives on low-fertility soils, resists severe drought, and responds with explosive growth and seed-set during wet, humid summers.

Because mature lovegrass is highly unpalatable to livestock, unmanaged infestations rapidly outcompete desirable temperate pastures, forming dense monocultures that dramatically degrade property values, reduce stock carrying capacity, and threaten critically endangered grassy woodlands.

Faced with this aggressive invader, private landowners and public agencies alike have spent decades testing a wide array of chemical, mechanical, and biological control methodologies.

The collective history of these control efforts underscores a fundamental truth: there is no single "magic bullet" or quick-fix strategy capable of eradicating African Lovegrass. True eradication is rarely achieved due to the plant's massive, persistent soil seedbank, which can hold millions of seeds per hectare ready to germinate at the first sign of open space and moisture.

Instead, long-term success requires shifting from a mindset of total immediate elimination to a strategy of sustained population depletion, strict property biosecurity, and integrated pasture management.

Summary

Over the iterations of this document, Tom's Creek Landcare has worked with local landholders to understand the control methods applied on their land, the successes, and failures, and what learnings can be passed onto the broader community.

In compiling these diverse field experiences, the most critical operational takeaway is that relying strictly on a single method of control inevitably fails. Across a variety of land uses, soil types, stock, and pastures, even the same management approaches have yielded vastly different results. A recurring message from all those who are grappling with ALG infestations is: you need to try multiple approaches until you find one that works for your farm, and then be persistent - it isn't going away overnight.

Ultimately, keeping African Lovegrass from re-emerging also requires strict operational hygiene and unwavering vigilance given its prevalence across the region.

Practical learnings

Combining the experience of landholders across the region managing ALG in a variety of land types, there are key messages on strategic management.

Move beyond spot spraying: Broadscale or high-density infestations cannot be eradicated or even controlled through spot spraying alone. Spot spraying in dense areas frequently misses smaller, immature seedlings, leading to rapid re-emergence.

Acknowledge and use the biomass: Extremely dense infestations (e.g., 80% coverage or higher) require a shift in perspective. Rather than relying strictly on heavy herbicide regimens, some practitioners successfully view the weed's extensive root systems and high organic matter as tools to build soil carbon, draw nutrients to the surface, and improve overall moisture retention through strategic mechanical pressure.

The myth of quick eradication: Eradication within a short timeframe (e.g., five years) is rarely realistic due to the weed's massive, persistent soil seedbank. Success must be measured by long-term population reduction, stabilised ground cover, and transitioning the land into a manageable, productive state.

Livestock are vectors: Sheep and cattle are highly effective vectors for seed transport via their hides, hooves, and digestive tracts. Avoid moving stock directly from infested paddocks into clean zones without a strict quarantine period (ideally holding them in a sacrificial containment paddock for at least 10 days to "clean out").

Review, repeat, repeat again: Successful long-term suppression requires unwavering persistence. Best-practice landholders recommend traversing paddocks in an intentional grid pattern at least once a month, and regularly reviewing the effectiveness of management regimes. Persistent repetition is crucial - African Lovegrass Management is a multi-year effort.

Chemical management insights

Glyphosate has limitations: While highly effective as a temporary knockdown for established parent plants, non-selective glyphosate treatments inevitably create bare patches of soil. Without immediate pasture competition, these bare patches form an ideal, unimpeded seedbed for a massive flush of re-germinating ALG seedlings.

Flupropanate application must follow best practices: Flupropanate can yield highly effective, long-term control of both mature plants and emerging seedlings, provided that users strictly adhere to proper rates and application timing. Landholders must be aware of the risks and considerations of using Flupropanate however. The herbicide can be up to three times the purchase price of glyphosate, meaning its long-term residual benefits must be weighed carefully against initial outlays. There are strict withholding periods for Flupropanate, and it can't be used in pastures with lactating cows.

Mixing herbicides doesn't always double the benefit: Combining glyphosate and flupropanate can accelerate early plant brown-off when targeting mature infestations approaching seed maturity, but it inherently eliminates the selectivity benefits that flupropanate offers when used alone.

Water quality matters: Poor water quality significantly inhibits herbicide efficacy. Adding a dedicated water conditioner or ammonium sulphate to the tank mix effectively neutralises hard water minerals and improves overall control success.

Physical intervention insights

Winter mulching can work: Some landholders have found mulching a highly effective alternative strategy by heavily mulching during winter. Dropping this thick layer of organic matter allows winter frosts to penetrate and rot out the ALG crowns, while soil microbiology breaks down the biomass to improve soil fertility. It's important no seed heads are present, as this will just spread the infestation further.

Manual removal for low densities: For isolated plants or small populations comprising less than 2% of a paddock, immediate physical extraction (digging or chipping out the entire plant base with a mattock) delivers excellent, low-disturbance results.

Pasture competition is key

Establish vigorous, summer-active species: Because ALG is a highly persistent, warm-season (C4) grass that thrives during wet, humid summers, creating a competitive barrier with desirable summer-active species is paramount. Kikuyu has proven to be effective because its growth cycle directly matches that of ALG. Other competitive options to encourage include varieties like Millet, Lucerne, Premier Digit grass, Phalaris, Cocksfoot, and Clover.

Maintain soil and pasture health: ALG thrives on low-fertility, overgrazed soils. Utilising regular soil testing, proper fertiliser mapping, and structured rotational grazing prevents the baring out of soil.

Strategic shading: In non-arable or lifestyle settings, establishing dense tree corridors or preserving certain native covers (like bracken fern) creates a continuous canopy; the resulting shade effectively retards and inhibits ALG growth.

Sometimes broad-scale pasture renovation is required

When facing severe broadacre infestations (e.g., 75–80% coverage, often the only way to make a significant impact to plant cover is with a broad-scale pasture renovation.

1. Implement a Strict Spray-and-Burn Sequence:

This helps to reduce the biomass and kill off plants at a broad scale. This must be followed immediately by cultivation or subsequent herbicide treatments, or the fire will simply stimulate a more vigorous weed regrowth.

2. Establish a High-Quality Summer Forage Crop:

Following the clean-up burn, sow a competitive, spring-sown summer crop like millet, turnips, or rape to choke out warm-season lovegrass regrowth while producing high-yield fodder.

3. Transition to a Winter Fodder Cycle:

Once summer cropping has reduced the ALG presence to a negligible level, follow the summer program with an autumn-sown winter forage crop.

4. Full Pasture Renovation:

Re-establishing perennial pastures requires a significant financial outlay. However, once you are confident that the underlying weed seedbank has been successfully depleted by the preliminary cropping phases, this substantial investment is justified to secure a productive, weed-resistant ground cover.

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