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African lovegrass management

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Introduction

African lovegrass (*Eragrostis curvula*) is a hardy, drought tolerant perennial grass species which thrives on sandy soils with low fertility. In some countries it is regarded as valuable for animal production and soil conservation but in others, such as Australia, it is regarded as a weed due to its low feed quality and acceptance by livestock. In Australia, seven agronomic types of African lovegrass are recognised. Its weed status depends on the environment in which it grows, the agronomic type and the land management being practised.



Figure 1. A heavy African lovegrass infestation. (M. Campbell)

Origins and distribution

African lovegrass is a native of southern Africa. It can also be found in Argentina and the United States where it is used as a forage plant. It was thought to have been accidentally introduced into Australia prior to 1900 and has since been deliberately introduced for experimental assessment.



Figure 2. African lovegrass on the coast. (L. Pope)

African lovegrass can be found throughout New South Wales (NSW) on roadsides and is a major weed of grazing lands. It is distributed throughout mainland Australia.

The problem

African lovegrass readily colonises overgrazed and disturbed sites such as roadsides and railway lines. Without management it will invade adjoining lands. Its ability to produce a large volume of seed means it can quickly form dense monocultures.

African lovegrass produces a limited quantity of green feed during the frost-free periods. In tableland environments, animal utilisation of the plant is limited to the spring and summer months when the plant is green and actively growing.

Overall carrying capacity is reduced with dense infestations. Forage quality declines with maturity and also with the commencement of frosts. Dry matter digestibility of the green leaf (the amount utilised by the animal) is at best 65% in early spring and 50% in early summer. Digestibility of the dead material is only 38% in winter. Crude protein of the dead leaf in winter is only 3.6%.

Trials have shown that sheep will lose weight dramatically when forced to graze African lovegrass on the northern tablelands in winter but can gain

weight in summer. A stocking rate of 20 wethers per hectare was necessary to force animals to eat the plant. Other more desirable pasture species such as phalaris, cocksfoot, fescue, ryegrass, kikuyu and many native species are more palatable to stock than African lovegrass.

Description and habitat

African lovegrass is a perennial grass that can grow from 30 cm to 120 cm tall. The stems are slender, erect and robust and are sometimes bent at the nodes. Leaf colour can vary from dark green to blue-green. The leaf blade is narrow (3 mm wide) and the margins often rolled. The ligule has a ring of white hairs. The seed head is described as a loose panicle (6–30 cm long). The root system is fibrous.

It is a highly persistent, summer-growing warm season (or C4) grass, which makes it more suited to subtropical areas. ('Warm season' means it has a reduced transpiration rate and high temperature tolerance, as well as having a greater efficiency of photosynthesis.) As a warm season plant it also means it is a more efficient weed in temperate areas and has the ability to survive under low and erratic rainfall conditions.

African lovegrass prefers low fertility acidic or sandy soil types.



Figure 3. African lovegrass seed head. (M. Campbell)

African lovegrass can be easily confused with other tussock-like grasses such as Poa tussock (*Poa labillardieri*). Ensure correct identification before undertaking a control program.

Consol lovegrass

Consol lovegrass has been selected from African lovegrass for sowing as a pasture plant, and is known as *Eragrostis curvula* cv. Consol. It does not have the weedy characteristics of other agronomic types of African lovegrass. It is sown on light sandy soils on the slopes and plains of NSW. However Consol lovegrass is not permitted to be grown in local government areas where African lovegrass is



Figure 4. African lovegrass plant. (M. Campbell)

declared noxious. For more information on Consol lovegrass see Primefact 121 (2006) *Consol lovegrass*.



Figure 5. Consol lovegrass (left) and African lovegrass (right). (L. Pope)

Lifecycle

African lovegrass can germinate at any time of the year but typically it will germinate in autumn or spring when moisture is sufficient and temperatures exceed 10°C. Growth of seedlings is relatively slow for the first six weeks. Flowering can occur from early summer and ripe seeds may be present from January to March. In coastal regions the plant can flower all year, but this occurs predominantly in the warmer months.

Seed has an inherent dormancy, which is broken after 5–6 months. Seed germination declines with age; however some seed can remain viable for up to 17 years.

Seeds germinate slowly and the plants have poor seedling vigour, making them susceptible to competition from other pastures species.

Plant growth slows when temperatures decline in autumn and winter. Although the plant is susceptible to frosting it remains alive and will regrow again as temperatures increase.



Figure 6. African lovegrass readily invades bare ground. (L. Pope)

Spread

The seed may be dispersed by grazing animals, slashing, vehicles, water, fodder and short distances by wind. Spread is enhanced by drought conditions and over-grazing. Paddocks with low ground cover are more susceptible to invasion.

Control methods

Control of African lovegrass is not an easy task and requires an integrated approach to be effective. The best option is to prevent establishment in the first place. In clean areas, be vigilant and control any small infestations.

Management should aim to maintain the vigour, persistence and competitiveness of desirable pasture species. Re-sowing pastures is expensive so appropriate management to maintain them over the long term needs to be employed.

For effective long-term control of larger areas of African lovegrass, an integrated program of spraying, sowing and pasture management must be used. Spraying alone is effective only where African lovegrass is selectively removed from a strong phalaris or kikuyu pasture. The main control principle is to ensure the weed is replaced by better species.

1. Farm hygiene

Preventing the spread of African lovegrass onto clean areas by physical means is the best method of control. Movement and spread of African lovegrass along roads is due to contaminated vehicles and machinery such as graders and slashers. Ensure that contractors have cleaned their vehicles and machinery of weed seeds before coming onto your property.

Livestock are largely responsible for the movement and establishment of African lovegrass within

paddocks. If possible avoid moving livestock from infested to clean areas on the property.

If this occurs, quarantine new stock in a small paddock for a minimum of 10 days to limit ingested seed being spread through manure. Inspect new livestock purchases for any evidence of weed seeds.

Boundary spraying infested paddocks with a 20–25 m strip will also help to prevent seed movement to clean areas and neighbouring properties.

Weed seeds are easily transported in hay and fodder purchases. If purchasing hay from a known African lovegrass area then check it for any obvious signs of weed seed contamination. Supplementary feeding in a smaller 'sacrifice' paddock is also a good idea to minimise weed seed spread.



Figure 7. Lovegrass will often be found along farm tracks (L. Pope)

2. Prevention

Prevent small infestations from becoming large ones by chipping or spot spraying. Soil disturbance should be minimised if possible. Consider if it is a better option to spot spray rather than disturb a large patch. If possible broadcast other suitable pasture species with fertiliser in any disturbed areas. Continue to monitor your property for signs of any new infestations. Being vigilant and making a commitment to treat small infestations before they become out of control is one of the best investments you can make.

Pastures are at greater risk of weed invasion when perennial ground cover is less than 70%. African lovegrass seedlings struggle to establish when ground cover is high. Ground cover is greatly influenced by grazing and nutrient management.

Appropriate grazing management allows for periods of rest for desirable pasture species. A weed resilient pasture will also be a more productive pasture.

3. Herbicides

The most effective herbicide to kill African lovegrass is the residual herbicide flupropanate. It enters the plant through the leaves and roots but may take three months to have a noticeable effect and up to 18 months to kill the plant.

Although effective at any time of the year it is best to avoid spraying in winter on the tablelands. Herbicides applied in a wet winter may leach beyond the root zone before a period of active growth allows uptake.

Glyphosate will also kill African lovegrass when applied to actively growing plants in spring and summer.

If spot spraying, ensure that the equipment and operator are calibrated correctly. Poor calibration can lead to over-application of herbicide that is costly and may pose dangers to the environment. Conversely, under-spraying may be ineffective. For assistance on how to calibrate your spot spraying contact Industry & Investment NSW or see the *Noxious and Environmental Weed Control Handbook* at www.dpi.nsw.gov.au/weeds

Withholding periods – flupropanate

Areas receiving blanket treatment of flupropanate (that is, treatment other than spot spraying) are not to be grazed or cut for stock food for at least 4 months after spraying. Areas receiving spot spray treatment are not to be grazed or cut for stock food for at least 14 days after spraying. Stock cannot be grazed in treated areas for at least 14 days prior to slaughter. Lactating cows or goats must not be grazed in treated areas.

4. Pasture establishment

African lovegrass can be controlled on arable land by establishing a new pasture. Initial preparation starting with sowing a cereal crop for one or two years first is preferable. This will provide opportunities to reduce the weed seed bank in the soil. Winter cereal crops such as oats, winter wheat, triticale or cereal rye can all be considered. Spring sown forage Brassica crops can also be used where summer/autumn feed is required. Seek advice from your local agronomist for suitable crops and varieties.

If the infestation is large, dead material should be removed first by burning the African lovegrass in winter, followed by thorough ploughing. A depth of 10 cm is ideal (chisel ploughs are not the most effective in removing large plant clumps). The fallow may be enhanced by a second cultivation in summer to remove any remaining plant remnants. Avoid excessive soil cultivation as soil structure may be damaged. Careful thought should be given to paddock slope to avoid potential erosion by wind and water prior to sowing.

Inaccessible areas such as rocky outcrops should be spot-sprayed in summer and surface-sown and top dressed with seed and fertiliser in autumn. Vermin such as rabbits should also be eradicated prior to sowing.

Autumn sowing of pastures is preferred if including annual legumes in a pasture mix. Only commence sowing when soil moisture is adequate and high temperatures have subsided. Cold temperatures and frosts will slow pasture establishment so every effort should be made to sow before the onset of the coldest winter months.

Pasture species such as cocksfoot, phalaris, fescue, digit grass, Rhodes grass and kikuyu on the coast should be used as a pasture base in addition to legumes such as subterranean and white clovers. Legumes will help smother any lovegrass seedlings and will also improve soil fertility. Good establishment of the perennial grass species is essential to success as these will be the major deterrent to lovegrass reinvasion in the long term. Crop and variety choice will depend on sowing time, location, soil pH and existing soil fertility status. Consult your local agronomist for variety recommendations for your soil type and area.

If direct drilling, aim to remove plant material by heavy grazing. Where a large bulk of material is present, burning may be necessary before spraying. A glyphosate-based herbicide can then be used to kill any re-growth once sufficient green leaf and active growth is occurring. This should occur in the spring prior to a planned sowing in autumn. A repeat application of glyphosate or other suitable herbicide may be necessary on the autumn break prior to sowing to kill any other weeds and new seedlings.



Figure 8. African lovegrass recovery following fire. (D. Alcock)

For further information on establishing pastures speak to your agronomist or go to www.dpi.nsw.gov.au/agriculture/field/pastures.

Non-arable land

While there are herbicides available for the control of heavy infestations of African lovegrass on non-arable land, they can have adverse effects on non-target species and some native vegetation. It is also difficult using aerial pasture establishment techniques to sufficiently improve the low fertility soils on which African lovegrass generally occurs.

Attempts to spray out and re-sow using aerial techniques require the application of large amounts of lime and fertiliser. Pasture establishment is risky and expensive, and returns on such an investment are not feasible.

5. New pasture management

Grazing

Newly sown pastures should be spelled for 12 months to help smother any germinating African lovegrass seedlings. If the pasture is sown in autumn, lenient grazing can commence in spring when the pasture is green, leafy and actively growing. Only graze new pastures when they are 10 cm tall and soil moisture is not limiting. This will assist tillering of shoots and encourage root development.

Avoid grazing if the paddock is extremely wet to prevent pugging of soils and damage to plants. Initial light grazing can commence once plants are not easily pulled out. It is essential that new pastures be allowed to set seed in the first spring/summer following any initial spring grazing. For a temperate pasture graze the pasture down to 5–7.5 cm in early autumn after the seed heads mature. Topdressing with fertiliser at this point will encourage legume growth prior to the onset of winter. Graze intermittently through the winter months and spell in October/ November of the second year to allow grasses to become strong. Remove animals for a second summer rest period. Summer rest periods are critical to developing strong perennial grasses. Strategic rotational grazing can commence to avoid overgrazing or under-utilisation of pasture.

Some examples of the impact of strategic grazing include the following.

- Using heavy stocking rates for short periods of time to force stock to eat plants they might otherwise ignore can prevent weeds taking over.
- Heavy grazing in spring can prevent grass dominance, reduce seed set of annual grasses (e.g. barley grass and brome grasses) and at the same time favour clover seed production. Conversely, lenient grazing in spring and summer can promote grass seeding and reduce clover

seeding and dominance which may lead to bloat problems.

- Summer rests can help to promote desirable perennial grasses.
- If necessary, sub clover germination can be reduced by maintaining a bulk of material from summer into the autumn.
- Never cut a new or very young pasture for hay or silage.

Fertilisers

All sown pastures will require on-going fertiliser to maintain vigorous healthy plants. The best way to determine what type and rate of fertiliser to apply is to use paddock history and soil tests. Moderate to heavy rates of fertiliser may be required in the early years to build soil fertility (if it is low) and maintain plant vigour. Rates thereafter will depend on stocking rate and rate of product removal.

Re-treatment

Monitor sown paddocks for signs of any new African lovegrass plants. Quick action to remove these by either spot spraying or chipping will ensure the new pasture and your investment are not lost.

Making the most of African lovegrass

In areas where African lovegrass is not declared noxious and in some local control authorities (LCAs) where it is declared noxious it may be unrealistic to control the African lovegrass. In these situations African lovegrass should be used as a pasture species (in areas where it is declared noxious, check the LCA's class 4 management plans for feasibility of this strategy). Its grazing value depends on the environment and the agronomic type present. In coastal areas it can supply significant quantities of low quality feed. However, in many tablelands situations the growing period is limited due to frosts. In all these areas it is important to make use of the leaf when it is young and green.

Heavy grazing can assist in controlling the maturity and resulting loss of quality of this grass. This may extend the growing season by several weeks. It should not be used as a control strategy to remove African lovegrass.

Burning of lovegrass can assist in reducing the bulk of old growth and allow the germination of other plants, but it can also have the effect of reducing the litter layer and drying soils. If this occurs in a dry season the resulting grass growth will be much less and the plants will mature faster. For nutritional advice contact your local Livestock Officer.

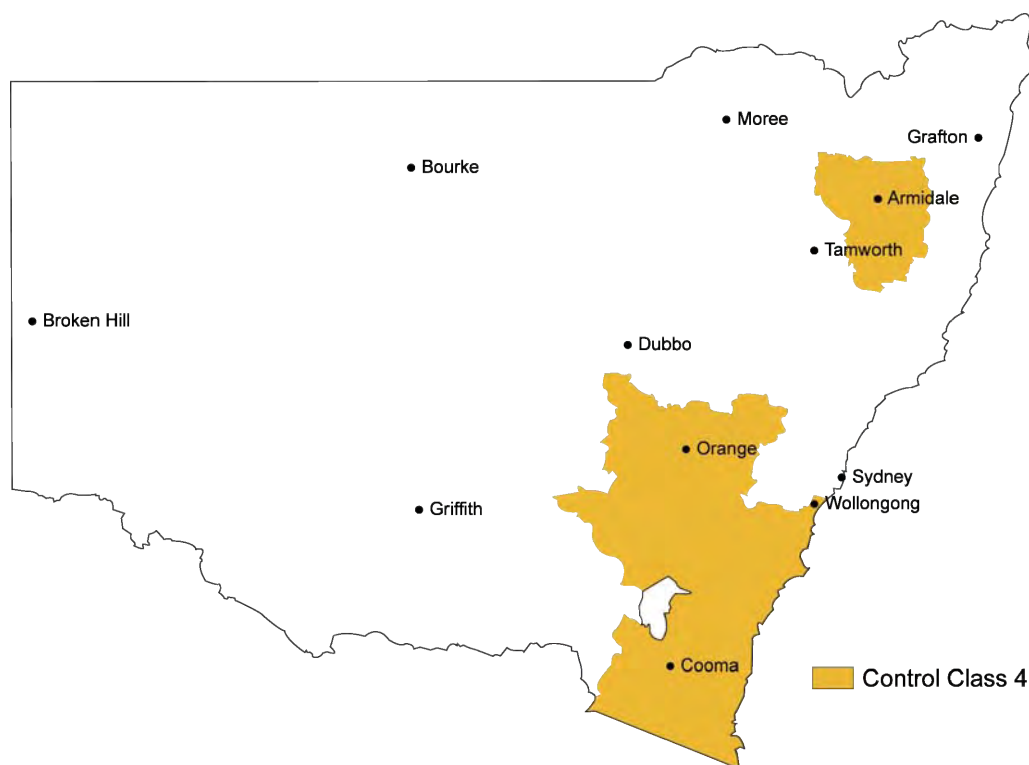


Figure 9. Declaration status of African lovegrass in NSW in 2009. (A. Maguire)

Legislation

African lovegrass is a declared noxious weed in many areas of NSW (see Figure 9). See www.dpi.nsw.gov.au/weeds for a complete list of declared noxious weeds for each control area in NSW.

It is declared a class 4 weed in many areas of NSW which means the growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority or council.

The responsibility for control of noxious plants and appropriate disposal of weed plant material on private land rests with the owner or occupier of the land. Failure to do so could result in the local control authority issuing a weed control notice, court action and a fine.

Local control authorities must control noxious weeds on public land adequately to prevent the infestation of adjoining land. Community members can assist the control of this weed by notifying the local control authority of any known infestation of African lovegrass on public land.

Further information

For further information on African lovegrass control, consult your local agronomist or weeds specialist for individual advice.

References

- Campbell, M (2002) *Effects of age on the germination of African lovegrass seed*, Grasslands Society Newsletter, Vol. 17, No. 1, 2002.
- Parsons & Cuthbertson (2001) *Noxious Weeds of Australia*.

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