mla
MEAT & LIVESTOCK AUSTRALIA

tips&tools
NATURAL RESOURCE MANAGEMENT

Weed removers, pasture improvers – effective weed control

Over 2,500 species of weeds are currently impacting on the Australian environment, and the cost of weeds to Australian agriculture now exceeds $4 billion per year. Weed removers and pasture improvers are essential in planning and implementing an effective weed control program.

Key benefits

- Effective long term control of pasture weeds will be obtained from an integrated approach incorporating a range of management tools.
- Implementing the '3Ds' of weed management can increase the competition from desirable pasture species while minimising the proportion of weed species present within the pasture.

Tactics

The three main steps of a successful weed management program are:

1. Remove the weed or reduce weed seed set.
2. Restrict weed germination.
3. Encourage competition from desirable species.

These objectives can only be met through developing an integrated approach which takes into account the growth characteristics of both desirable species and weeds.

The key questions which should be addressed in planning and implementing an effective weed control and pasture improvement program are based on the '3Ds' of weed management:

- Deliberation:
  - Where am I?
  - Where do I want to be?
- Diversity:
  - What tools do I need?
  - How do I get there?
- Diligence:
  - How do I stay there?

Deliberation

Where am I?

Step one

The first step in planning any pasture improvement or weed control program is to 'know what you've got', that is, to assess the pasture composition: the botanical and growth characteristics of the various plants including both desirable species and weeds.

Pasture assessment acts as the starting point in helping to determine the extent of the actual weed problem and whether there are sufficient desirable species to 'encourage' through targeted weed management.

Describe and categorise plant species according to the following botanical features:

- weed vs desirable species
- annual vs biennial vs perennial
- grass vs broadleaf weed vs legume

Determining the level of weed infestation will indicate:

- whether control is warranted
- which weeds are having the greatest impact
- priority paddocks for weed control and their locations
- potential control and management tactics

Determining the level of desirable species will indicate:

- whether pasture renovation, restoration or replacement (ie resowing) is a better option
- the potential of the paddock ie what forage production levels are possible and its suitability for different livestock classes
- priority paddocks for weed control, pasture improvement and fertiliser application

Assessing botanical composition is explained in MLA's *Pasture health kit*. A method for prioritising paddocks is explained in the Tip & Tool *Managing weeds after drought.*

Step two

For successful control, understanding of the seed production and recruitment (ie germination) periods of the major weeds and pasture plants is essential.

For key weeds you have identified describe the following:

- main period for germination and flowering/seed production
- effective growing period
- known weak links or strong points in its life cycle
- important differentiating features or unique qualities
- declared weed status ie noxious

Timing of weed establishment and persistence is essential when determining management options to reduce weed numbers. Identifying and targeting the weak links in the weed's life cycle and correspondingly the strong points in those of the desirable species is a key factor for successful management.

Many weeds can rapidly colonise bare areas

How and when to assess pastures

A number of different methods are available to assess pasture composition. These include the 'end point' technique, as described in the *Pasture health kit*, and the transect, quadrat and 'Blundstone' techniques, which are demonstrated in the EDGE*network*® 'Weed Removers Pasture Improvers' course. Of these, the end point and transect techniques are likely to be the most accurate and easy to use.

Pasture assessment to determine species composition should be undertaken at the same location within a paddock, using the same technique and at the same time each year. In most of southern Australia this is during early spring when pastures are short and there has been the maximum possible germination and establishment of both desirable pasture and weed species. This allows for accuracy and consistency of results and provides a meaningful comparison of changes in pasture composition over time.

Where do I want to be?

Establish a pasture composition target for each paddock or pasture type. This target may be something like 'in five years to have 60% of the pasture species as perennial grasses'. This provides a goal to work towards for weed reduction and pasture improvement. The ideal pasture composition will vary from paddock to paddock and is influenced by various physical factors including pasture type (ie native versus introduced), climate, soil type, aspect, slope etc. It must also match the livestock enterprise and production goals for the paddock ie running wethers versus finishing steers.

The species composition target must also consider weed type and therefore it is useful to prioritise weeds and paddocks for control. For instance, weeds with some forage value, such as annual grasses, may be contained below an upper limit, while noxious weeds or highly aggressive and invasive unpalatable weeds should preferably be eradicated. For this reason, it is suggested that a desirable target range or zone is described for each pasture component rather than an absolute paddock outcome.

The following is a useful starting guide for planning pasture composition targets:

- weed vs desirable species
- annual vs biennial vs perennial
- grass vs broadleaf weed vs legume

Evaluate the paddock pasture composition relative to the target. In some situations, such as when perennial grass content is less than 20%, it will probably necessitate a complete renovation, while in others it will be possible to improve through the integrated use of strategies that encourage desirable species and remove weeds.

Diversity

What tools do I need?

Remember the three key objectives of weed management are:

- Remove the weed or reduce weed seed set.
- Reduce weed germination.
- Encourage competition from desirable species.

A wide range of cost-effective ‘restoration’ tools are available to achieve these objectives, and may be broadly categorised as either 'weed removers' (which remove weeds from pastures and/or reduce weed seed set) or 'pasture improvers' (which encourage desirable and competitive species).

Effective lasting control will only be achieved by developing an integrated, well planned approach using a combination of management options from each category.

Plan to use as many tools as possible in conjunction with each other, so that all the tools, such as tactical use of fertiliser, improved grazing decisions, tactical herbicide use, biological control agents, pasture renovation and cropping, can assist in weed management – the greater the weed problem the more tools will be required. Managing livestock and grazing pressure and ensuring competitive species are fundamental to all programs.

Pasture improvers

✓ Fertiliser

- Implement a well planned fertiliser program which increases soil fertility to encourage ‘fertiliser responsive’ perennial species to dominate the pasture. When the level of desirable species is initially low, the first priority will be to remove weeds.
- Use soil tests to determine fertiliser rates, specific nutrient requirements and frequency of application.
- Application of fertiliser is not ‘feeding the weeds’; rather it enhances the competitive ability of desirable species.
- Maintain soils at the appropriate pH or level of acidity to provide optimum conditions for pasture growth. Soil test to determine pH levels and lime requirement.

✓ Grazing management and rest

- The tactical use of livestock and grazing management is an important tool in maintaining and encouraging the competitive ability of desirable species while also helping to reduce or eliminate weeds from pastures. In the absence of appropriate grazing management it is difficult to maintain a quality perennial pasture and nearly impossible to restore a degraded pasture without the expensive cost of resowing.
- By applying suitable stocking rates that do not over or under-utilise desirable species and by introducing tactical rests, perennial species should remain vigorous and competitive within the pasture.
- Periods of grazing rest allow the perennial species to set seed, and increase basal cover and root development so that perennial grasses can recover from, and prepare for, grazing.

✓ Grazing palatable weeds

By varying grazing frequency and intensity (how long and how hard animals graze a paddock), vegetative weeds may be consumed by livestock. Ensure that plants are not toxic to stock; short high-density grazing at key stages of establishment of broadleafed weeds, for example, will reduce the weed population.

✓ Cropping phase

In pastures severely depleted of desirable species a short term cropping phase can greatly assist in weed removal, while at the same time increasing cash flow.

✓ Pasture establishment

- Pasture establishment may be the best option for restoring a severely degraded pasture. Pasture establishment is usually an expensive option with considerable associated risk and therefore must be planned and implemented properly.
- The decision as to whether a pasture is sufficiently degraded or not to warrant total replacement will be determined by the assessment of plant composition.

✓ Pest management

- The management of invertebrate and insect pests is important to maintain the health of perennial grasses and legumes.

Weed removers

✓ Herbicides

- Herbicides are a useful first step and provide a quick fix/one hit solution to the problem. However, in the absence of other management inputs and associated changes in grazing management, control is rapidly lost.
- The aim of chemical control is to selectively control the undesirable weeds but to leave desirable pasture plants relatively unharmed and sufficiently competitive. Care should be taken to avoid damage to non-target species within the pasture and on neighbouring areas.
- Always read the label, follow the directions and seek additional information from the supplier if unsure.

✓ Spray grazing

- Integrate the application of sub-lethal rates of the herbicides MCPA, 2,4-D amine and 2,4-DB amine with heavy grazing pressure to consume broadleaf weeds in pastures.
- Damage to pastures, including legumes, is minimal due to the low rates of herbicides used.

✓ Biological control

- Introduction of natural control agents, usually from the weed’s country of origin.
- Biocontrol agents are usually slow acting and should be regarded as part of an integrated approach.
- Obtain information about biological control agents from CSIRO Entomology (visit www.csiro.com.au/ento) or your local Department of Primary Industries.

✓ **Tactical grazing pressure**

- High-density strategic grazing pressure for a short period can reduce seed production capacity and weaken the plant, making it more vulnerable to competition.

✓ **Slashing and silage/hay removal**

- Cutting the pasture in spring before flowering will reduce seed production. For more information, refer to the TopFodder program or manual (see Further information box).

Reduce weed germination

✓ **Groundcover retention**

- Maintain greater than 1,500 kg/ha of dry matter (including litter) and at least 80% groundcover at the autumn break in order to reduce weed seedling germination and establishment.

How do I get there? Putting it all together

Reliance upon just a chemical approach to weed control will not address the long term problem. The reasons why a weed is present must be addressed. Effective weed control must be accompanied by a change in pasture and livestock management. It is recommended that you use and integrate a range of options that reduce weed seed set, reduce weed germination, and encourage competition from desirable species.

Give due consideration to the seasonal growth stages for each of the pasture components – strategies must be timed to the weed's and desirable species' life cycles. Weed removers or pasture improvers should integrate and complement one another and must be implemented at the optimum time to achieve the desirable outcomes. The preferred approach is to establish a yearly 'calendar of operations' in which the life cycle for each plant is first described and then the range of management tools is identified and superimposed so that it is possible to predict 'cause and effect'.

There is no recipe or formula for success; each situation is different and there is a need to use the appropriate tactics and methods to suit the individual situation.

Prioritising paddocks for control is a 'must do' action. Priority paddocks are those with the potential to respond rapidly to management input and achieve the desired composition and production targets in the quickest and most cost-effective way.

Diligence

How do I stay there?

- Continue to monitor the paddock regularly (ie annually) by assessing botanical composition to detect changes in pasture composition and signs of decline.
- Develop a paddock management diary noting timing and effectiveness of actions.
- Review the composition, identify from the diary any reasons for a change in composition, and take early steps to address these.
- Avoid overgrazing and creating bare areas; avoid set stocking where animals can continually graze preferred plants and leave other undesirables to flourish; allow periodic rest and place special emphasis upon the 'pasture improvers'.

The key is to be diligent, maintain ongoing vigilance and take a proactive stance.

Acknowledgements

Stuart Burge, pasture agronomist.

Jeff Burton and Peter Dowling, 2002, *Pasture Management for Weed Control*, CRC for Australian Weed Management and NSW Agriculture.

Note: The various tools and management guidelines as outlined in this Tip & Tool are more comprehensively described and demonstrated in the EDGEnetwork® 'Weed Removers Pasture Improvers' course.

Further information

To find out about other MLA publications on pastures and weed control, visit www.mla.com.au/publications, email publications@mla.com.au or phone MLA on 1800 675 717.

For MLA's EDGE*network*® courses, contact MLA's EDGE*network*® on 1800 993 343 or email edgenetwork@mla.com.au

For more information on the TopFodder manual, contact your local Department of Primary Industries.

For additional information, contact your local pasture or livestock advisor, or visit the CRC for Australian Weed Management website, www.weeds.crc.org.au

MEAT & LIVESTOCK AUSTRALIA

Level 1, 165 Walker Street
North Sydney NSW 2060
Ph: 02 9463 9333
Fax: 02 9463 9393
www.mla.com.au

Printed March 2007 ISBN: 9 78174 191 0841