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tips&tools
NATURAL RESOURCE MANAGEMENT

Managing weeds after drought

The start of the growing season is typically a high-risk period for weed germination and establishment. Integral to effective control are the '3Ds' of weed management – deliberation, diversity and diligence.

The threat

Weeds pose a major threat to pasture productivity when the season breaks after drought – the effects can be long lasting:

- Bare or sparse ground and weak remaining perennial plants allow weeds to get ahead quickly.
- Pasture seed reserves are reduced, limiting their capacity to compete with weeds.
- Many weeds have seeds that last in the soil for several years.
- Bare ground and weed seed reserves will enable massive germination of weeds.

The opportunity

The start of the growing season provides the opportunity for long-term gains if you are able to attack weeds before they establish a permanent foothold. This is achieved by controlling the massive germination and subsequent establishment of weeds. If left uncontrolled, soil-based weed seed reserves will be replenished and continually impact on the recovery of perennial pasture species.

A long lasting legacy of drought is the encroachment of weeds, which may have long-term production and environmental consequences. During drought, the increasing bare ground, decline in the competitiveness of perennial species and reduction in the soil seed bank reserves of desirable species make pastures vulnerable to weed invasion.

Key benefits

- Prioritise paddocks for weed control using a simple SWOT assessment.
- Achieve long-term gains through careful weed and pasture management during and after periods of drought.

Weeds during or after drought originate from a number of sources:

- Perennial species may already be present as established mature plants on the farm.
- A seed bank of a range of weeds may already be well-established on the property.
- Seed may have been introduced externally onto the property in purchased grain or hay or via animals leased or agisted onto the property.
- Seed may have been windblown from adjoining lands.

Weeds are opportunistic colonisers at the end of a drought, when conditions are conducive to their rapid germination and establishment.

The start of the growing season represents a critical period in overall weed and pasture management. It provides a threat in terms of the invasive spread of weeds but also presents an opportunity to attack weeds before they become well-established. The seedling stage is the most vulnerable, and should be targeted in any weed management program.

The decision-making process with regard to effective weed management should encompass the following step by step approach:

1. **Determine the weed status/risk** of individual paddocks using a SWOT analysis as outlined in Table 1.
2. **Prioritise paddocks for control** based upon the results of the individual SWOT analysis.
3. **Evaluate the various weed management tools** available and allocate according to the situation, economics and overall farm management goals.
4. **Implement a plan** of action. Use the '3Ds' approach described in Table 2.

Paddock weed risk assessment

Develop your weed management program from a whole-of-farm outlook as well as on an individual paddock basis. The following 'SWOT' (strengths, weaknesses, opportunities and threats) analysis approach is recommended. This requires defining the strengths and weaknesses of the paddock situation, and the threats to, and opportunities for, weed management.

Tools and tactics for paddocks with <20% surviving perennial grasses

Paddocks which have less than 20% perennial grass should be identified for resowing. If possible, they may be sown to a forage crop or winter cereal.

Tools and tactics for paddocks with >20% surviving perennial grasses

1. Paddocks with approximately 20% perennial grass (ie 20–30%) have a pasture base that can respond well to restoration tactics by grazing – the best tactic is to completely destock priority paddocks for 12 months.
2. Paddocks with greater than 20–30% perennial grass:
   - In accordance with the SWOT analysis, prioritise the paddocks with the most serious weed threat.
   - At the start of the growing season these paddocks must be rested from grazing until they grow 1,000kg DM/ha, which equates to about 3cm of green feed. This will have a two-fold benefit. It will allow perennial species to develop a vigorous root system and generate sufficient leaf area to ensure optimum growth rates. It will also provide maximum competition with the weeds.
   - Apply fertiliser strategically in accordance with soil test results and to those pastures which will be the most responsive.
   - Apply herbicides to broadleaf weeds where appropriate and necessary in accordance with label registrations, taking care to minimise damage to non-target species, notably legumes.
   - Rotationally graze pastures during autumn/winter, making sure not to graze below 1,000kg green DM/ha.
   - In late winter/early spring spell pasture for approximately four weeks to encourage stem elongation of annual grasses.
   - Graze paddock for a short duration using high density grazing to reduce seed production of annual grasses.
   - Spell paddock from grazing for 10–12 weeks from mid-spring onwards to allow perennial grasses to replenish root reserves and increase basal area. The competition provided by perennial grasses will also help to reduce seed production of annual and broadleaf weeds.

Table 1 A SWOT analysis helps to quickly determine paddocks for priority action.

Strengths (capacity of pastures to compete) and weaknesses (susceptibility to weed invasion)	Risk score	Your score
Groundcover • >90% • 70–90% • <70%	 **0** **1** **2**	
Note: *The preferred level of groundcover will vary according to the environment and potential weed problem. In sloping, non-arable terrain of low fertility a target of 100% may be more appropriate.*		
Herbage mass • >1,500kg DM/ha • 1,000–1,500kg DM/ha • <1,000kg DM/ha	 **0** **1** **2**	
Note: *When highly invasive and difficult to control weeds (eg serrated tussock) are a threat, a target of 1,500kg DM/ha is recommended.*		
Perennials • >30% • 20–30% • <20%	 **0** **1** **2**	
Note: *The target level of perennial species will vary according to environment, rainfall, pasture type and soil type. Seek advice for your location.*		
Fertility status • High fertility in perennial pastures • Low fertility in perennial pastures • Low fertility in annual pastures • High fertility in annual pastures	 **0** **2** **1** **2**	
Note: *High fertility in pastures of low perennial grass content will encourage weed growth. Low fertility soils allow well-adapted weeds to out-compete pasture species with higher nutrient requirements. This is a predictor of responsiveness of pastures to rainfall and capacity to compete with weeds.*		
Threats – which weeds are the most important to control		
• **Declared noxious and perennial weeds** – eg serrated tussock, African lovegrass, Chilean needlegrass, St John's wort • **Invasive and competitive biennial and annual broadleaf weeds** – eg silver leaf nightshade, onopordum thistles, fireweed, nodding thistle, heliotrope, ragwort • **Annual broadleaf weeds** – unpalatable and difficult to control – eg thistles, Paterson's curse • **Annual broadleaf weeds** – palatable – eg capeweed, brassicas • **Annual grass weeds** which provide a useful feed source but may host soil borne disease for crops	**5** **4** **3** **2** **1**	
Total risk assessment Add up your scores in the right-hand column to determine your risk of weed invasion. The higher the ranking, the greater the need to prioritise this paddock for effective weed management post-drought.		
Opportunities – key management strategies		
• <20% perennials – pasture degraded, needs resowing or renovation • ~20–30% perennials – destock for 12 months to allow to recover • >30% perennials – good basis for a productive, competitive perennial pasture. Needs to be grazed strategically to allow plants to recover, regenerate carbohydrate root reserves and increase spread.		

Table 2 Follow the '3Ds' (deliberation, diversity, diligence) of weed management to improve weed control.

Deliberation **Think about it!**	**Stocktake**	• Conduct a SWOT of the paddocks to determine priority for action.
	Plan strategies	• Seek advice on the management options available if unsure. • Develop management plans: – Short-term for action when the season breaks – gather resources – Longer-term for strategic paddock and pasture management • Aim for: – Prevention – limit incursions and spread – Eradication – stop seed set, eliminate germinating weeds – Competitive pastures, >90% groundcover – Grazing and fertilisers to encourage pasture recovery
Diversity **Deploy many ways!**	**Use several tools**	• Resow areas with <20% perennial grass to improved species. • Apply fertiliser to potentially responsive pastures – use soil tests. • Apply herbicides – kill young weeds, prevent seed set, spot spray. • Increase stock grazing pressure enabling stock to consume non-toxic vegetative weeds. • Spell paddocks during establishment and reproduction (flowering) of desirable species. • Cut pasture for silage. • Crop rotations (on arable land) exhaust weed seed reserves.
Diligence **Keep at it!**	**Persist**	• Monitor regularly to check effect of control tactics and any new outbreaks. • Follow up relentlessly – repeat or vary tools where controls are poor. • Graze and fertilise to foster competitive pastures. • Control escape areas, patches and rogue plants. • Review weed management action plans each year.
	Prevent	• Stop seed set – chemicals, grazing, slashing • Quarantine: – Clean equipment and vehicles in one location, kill weeds. – Isolate stock and equipment from infested areas. – Feed imported hay and grain in areas suitable for weed control. – Use herbicides or remove weeds along perimeters.

Acknowledgments

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Further information

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

For additional information, contact local weed advisors, agricultural offices, Catchment Management Authorities and Departments of Primary Industries, or visit the CRC for Australian Weed Management website, www.weeds.crc.org.au

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