



Coleman Ridge, Canberra D. Tinney

UMCCC – UPPER MURRUMBIDGEE CATCHMENT COORDINATING COMMITTEE

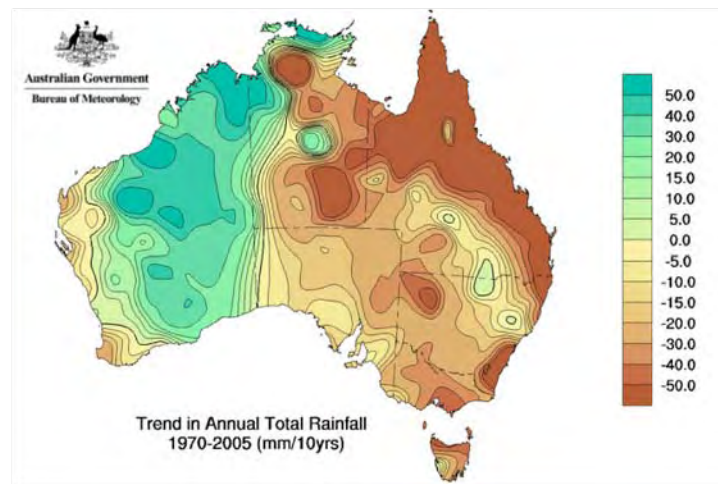
# LIVING WITH DROUGHT

FOR SMALL RURAL BLOCKS IN THE UPPER MURRUMBIDGEE...

The impact of drought on small acreage and lifestyle farmers varies in its effects and intensity. Although non-production farms may not experience the financial hardships of traditional farmers, the struggle to safeguard pastures, protect water resources and care for stock is universal.

This booklet is designed for owners of small rural blocks. It provides a starting point to address issues you may have to deal with in times of drought. Advice in this booklet is centred on good farm planning and sustainable management of your land to help your property withstand harsh seasons and allow it to flourish in good seasons.

This publication is divided into three subsections :  
 Preparing for Drought, Surviving Drought and Recovering from Drought.



Reproduced from the Australian Bureau of Meteorology website



Photo: D. Tinney

It covers topics such as:

- Planning ahead
- Looking after your trees and pastures
- Feeding stock
- Looking after your water quality
- Useful web sites, publications and contacts.

# Preparing for Drought

## WHAT IS A DROUGHT?

Some people feel they are in drought after several weeks without rain. Others do not recognise a drought until their pastures are completely denuded. A general definition of drought is 'conditions under which rainfall is insufficient for normal farming practices of the region to be conducted.'

Dry periods are part of a natural process; they *will* happen. The best you can do is to plan for dry periods, be prepared to manage them, and make management decisions according to a predetermined time-line. Don't put off making decisions about managing your land or your stock.

As a landholder one of the best skills you can learn is to interpret and understand the weather and its patterns. Websites such as the Bureau of Meteorology site can help with this.

For further information see: "Living with Drought", Bureau of Meteorology. [www.bom.gov.au](http://www.bom.gov.au)

Putting off making decisions until a drought has become severe will seriously limit your management choices.

Photo: D. Tinney



## Preparing for Drought

Small area farmers have the same responsibility for managing their land that mainstream farmers do. Management strategies need to provide for the care of stock, and prevent land degradation. A great way to do this is by developing a "farm plan".

## Farm Planning

A well thought out farm plan that sets out how you can use and manage your land over time will pay dividends, especially in difficult drought conditions. Putting off making decisions until a drought has become severe will seriously limit your management choices.

A farm plan should start by showing existing property features e.g. vegetation, fences, water sources, pastures, infrastructure, on a map. The plan can then be developed to show details of improvements you wish to make, integrated into your budget, your personal goals and aspirations. Farm plans allow changes and improvements to be done in order of priority.



Photo: J. Harding

Portable troughs such as this enable a flexible approach to paddock division

## FARM PLANNING

As you start to make a farm plan ask yourself the following questions:

What do I want to do with my property?

What is the purpose of any stock that I have? (eg. pets, lawn mowers, profit, free agistment). Your reasons will

affect the decisions you make about your stock.

What is my financial situation and what is the relative priority that I give to my stock and land?

Should I allow stock to breed, since pregnant and/or lactating stock may need up to twice as much feed?

Do I have the time and equipment to consider storage of stock feed and supplementary feeding?

How long might supplementary feeding last?

What are the feeding and watering needs of my stock?

What supplementary feeds are available, now and in the foreseeable future and at what price?

Does my property layout allow paddocks to be rested from grazing? (Temporary electric fences can be a cheap easy way to split existing paddocks to allow some areas to be rested without closing off an entire paddock.)

Is suitable agistment available?

At what point am I willing to sell stock?

What strategies do I need to put in place to recover from drought?

At what point will I reassess my plan?



Photo: J. Harding

## Hints for Developing a Farm Plan:

Spend time getting to know your land. Walk over it as often as possible and look closely at what is growing and changing. Research the land class of your property, know what type of soil you have. Learn how to measure or estimate ground cover.

Research the history of your property to help identify possible historical problems such as old sheep dips, salt scalds, weed infestations or eroded areas.

Farm tracks can cause soil disturbance, soil compaction and introduce weeds. Therefore, reduce farm tracks to a minimum and keep them to the edge of paddocks where possible. Avoid driving where there are no tracks.

Troughs and gates can be a major site for soil disturbance and compaction as stock congregate around them. Locate troughs and gates to reduce impacts on the rest of the paddock.

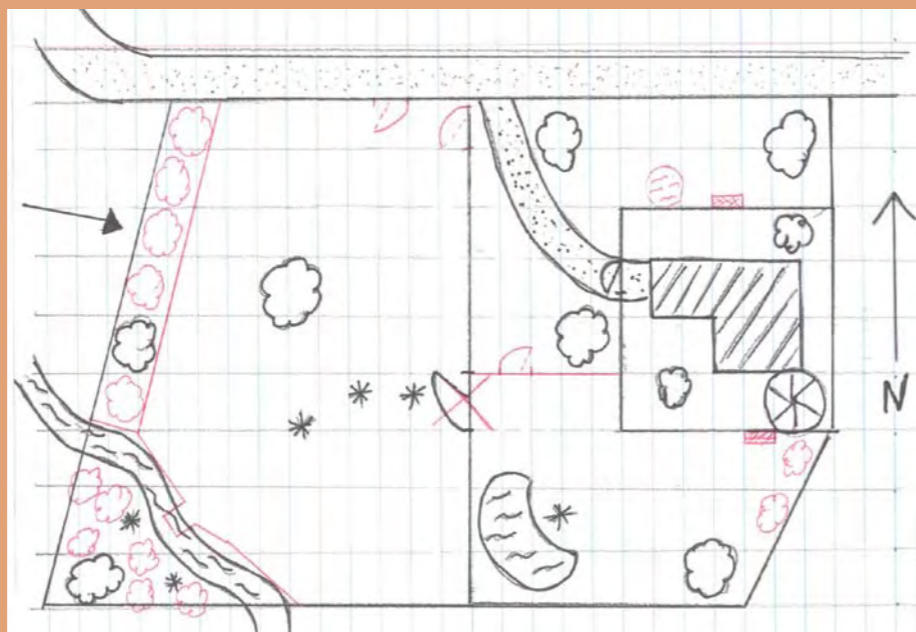
Prioritise investment to the areas of your property that offers the greatest returns. Returns can be financial, aesthetic or environmental, or a mix of all three.

For more information: "Taking Control – Property Management Planning" Vince van der Rijt. Centre for Conservation Farming, Charles Sturt University; ProFarm Courses, <http://www.dpi.nsw.gov.au>

## Assessing the Capacity of Your Block

Knowing the capacity of your block and the grazing requirements of your stock are direct ways you can avoid adverse outcomes from drought.

The stocking rate and type of stock you choose is likely to be the single most important management decision you make for your block. It can be difficult to determine the appropriate stocking rate for your property. The best indication of how well your pasture is doing is by the condition of your stock, rather than how your pasture compares to that of your neighbours.



Mock farm plan Illustrated by J Harding

Existing infrastructure (in black)  
Planned work (in red)  
• Erosion points





Some signs that stocking rates are too high or too low:

Stocking rate too high	Stocking rate too low
Increase in percentage of bare ground	Increase in less palatable species
Stock losing condition	Plant litter smothering new plants
Erosion occurring	
Increase in weeds	

## Land class

Knowing the land capability of your block will enable you to better plan your stocking rates without causing permanent damage to pastures. Land capability is often referred to as "land class" and is defined primarily by the slope of your block. It will help indicate if your block has the capacity to carry the stock you have or want to have.

Land class is indicated by a number between 1 and 8. A very simplified but practical way of looking at land class is set out in the table below.

Land class ranges	Land use options and suggested soil conservation practices
1-2 (0-3 degree slope) 	Arable land suitable for regular cultivation crops, and/or high input introduced pastures. No special soil conservation works or practices necessary.
3-4 (3-6 degree slope) 	Grazing land well suited to introduced pastures. It may be cultivated or cropped in a rotation with pasture. Structural soil conservation works such as diversion banks, graded banks and waterways. Soil conservation practices such as pasture improvement, stock control, application of fertiliser and minimal cultivation for the establishment or re-establishment of permanent pasture.
5-6 (6-18 degree slope) 	Land suitable for grazing but not for cultivation. Structural soil conservation works such as absorption banks, diversion banks and contour ripping. Soil conservation practices including limitation of stock, broadcasting of seed and fertiliser, prevention of fire and destruction of vermin. This class may require some structural works.
7-8 (18 + degree slope) 	Land not suitable for agriculture or at best suited to light grazing. Best protected by green timber, incapable of sustaining agriculture. Best suited for conservation.

Adapted from Landscan NSW Dept. of Primary Industries & NSW Environment Protection Authority.

NB. Land having greater than 18 degrees of slope may be mapped as protected lands which precludes clearing without authorisation.

The majority of land in the Upper Murrumbidgee catchment area lies between land class 3 and 7. To find out the exact land class of your block, contact the Rural Lands Protection Board (Contact details Pg 20).

For further information see: "Calculation of Fodder Reserves on Your Land." Mason-Jones. Small Farms Magazine, <http://www.smallfarms.net>; "Stocking Rates", Small Talk Sept - Nov 2005, [http://www.amlnrm.sa.gov.au/news/small\\_talk/s\\_t\\_sept\\_nov05.pdf](http://www.amlnrm.sa.gov.au/news/small_talk/s_t_sept_nov05.pdf). Agfact Ac.26 - "Agricultural land classification", [www.rirdc.gov.au/agfacts/](http://www.rirdc.gov.au/agfacts/)

## DSE

Land class is used to calculate the carrying capacity of your land. This carrying capacity is expressed in Dry Sheep Equivalent (DSE) units. DSE is calculated on the feed requirements of one adult merino sheep, eg. a pony has a DSE of 6, meaning it will eat roughly the same amount as 6 adult sheep.

Rough Dry Sheep Equivalencies

Stock	DSE
Cattle	12
Horses	13
Ponies	6
Alpacas	1
Goats	1.5
Kangaroos	0.75

NB: A "dry" sheep is neither pregnant nor lactating

DSE rating for properties in NSW are printed on rates notices from your Rural Lands Protection Board (RLPB).

## Managing Your Pastures to Make Them Last

Pastures are historically the overlooked casualties of drought. There is a strong link between grazing management and the capacity of land to produce quality pastures and fodder. Careful grazing strategies can increase the diversity and resilience of pastures. Often, 'dry conditions' are not the beginning of pasture problems but serve to make visible stressors including:

- Overgrazing
- Pests
- Poor soil nutrient and pH levels
- Poor soil structure

The effects of these stressors can be seen in:

- Bare patches and erosion
- Decline in vegetation cover, including paddock trees and native grasses
- Declining soil structure and organic matter
- Increased weed invasion or any one species becoming a monoculture

Courses such as ProGrazz can help you learn how to better manage your pastures, and are available through NSW State agencies and other private service providers (see Pg. 20 for details).

## Maintaining Healthy Pastures

Pastures need to be maintained for productivity and conservation.

### Some hints on how to do this:

Increase the level of perennial grasses in the pasture. Perennial grasses will go dormant, but do not die off each year as annual grasses do.

If you wish to increase green growth, slashing when the pasture starts to go rank will achieve this. In comparison if you wish to improve the density of your pasture for following seasons, leaving grasses to go to seed will increase the seed bank in the soil.

Rest paddocks with perennial grasses on alternate years and when grasses are flowering and seeding (For most species this occurs during Nov –Jan).

Avoid soil disturbances, eg. driving on paddocks. Disturbance can reduce growth and increase weeds.

Wherever possible maintain maximum groundcover.

Test your soil, as this can help identify soil health issues that may be limiting growth (see Pg. 6 for more info).

Application of organic matter can rectify deficiencies.

### Healthy Perennial Pastures Can Help to:

- Promote soil stability and prevent soil erosion
- Provide habitat for native flora and fauna
- Provide quality grazing for stock
- Increase rainfall infiltration
- Improve water quality in farm dams and creeks
- Combat dryland salinity and soil acidity



Native Kangaroo Grass can be a very useful pasture plant.  
Photo: J. Morris

## Developing Native Pasture

Native pastures are a valuable resource because they have already evolved to survive harsh Australian conditions. They are able to grow on steep middle to upper hill slopes. These areas commonly have shallow erodible soils that are acidic and of low soil fertility. Native grasses also provide valuable habitat for native fauna.

For further information see: "The Graziers Guide to Pastures", NSW Dept. of Primary Industries; Agfacts P2.2.6- "8 steps to successful perennial pasture establishment" and Agfacts P2.1.14 - "Managing groundcover to reduce erosions and sustain production" [www.rirde.gov.au/agfacts/](http://www.rirde.gov.au/agfacts/)

### DROUGHT RESILIENT LANDSCAPES

Developing and maintaining healthy soils and pastures before a prolonged dry period can buffer the small block owner from drought conditions. Healthy soils are resilient and well worth the investment.

### Achieve healthy soils by:

- Increasing organic matter.
- Maintaining ground cover and healthy pastures.
- Reducing soil compaction by developing a farm plan.
- Addressing soil health issues (e.g. erosion, nutrient deficiencies, acidity, sodicity, salinity).

Perennial pastures (consisting of deep rooted plants that grow all year round) are more resilient, and recover from stress faster than annual pastures. A mix of warm and cool season perennial plants can provide feed all-year-round.

Annual species still play an important role in the pasture; they are often a major part of a spring flush and are always better than having no plants. Clover and rye grass are examples of useful annual plants.

### Some examples of perennial and annual pasture plants:

Exotic cool season perennials

Phalaris, Cocksfoot, Fescue, Perennial rye grass

Native cool season perennials

*Microleana stipoides* (Weeping Grass) *Danthonia spp* (Wallaby Grass)

Native warm season perennials

*Bothriochloa macra* (Red Leg grass), *Themeda sp.*(Kangaroo Grass).

Annuals

Annual rye grass, barley grass, sub clover.

Exotic Broad leaf weeds Eg Capeweed.

For help with pastures contact NSW Dept. of Primary Industries, or Territory and Municipal Services in the ACT (See Pg. 20 for details).

For further information see: Primefacts - "Visually Assessing Pasture Condition and Availability in Drought." Prime facts - "Pasture Sustainability and Management in Drought." NSW Dept of Primary Industries.



*Lomandra longifolia* is a robust native plant.  
Photo: J. Morris

## The Importance of Organic Matter

Organic matter improves soil structure, increases the soil water holding capacity, supplies important plant nutrients, and encourages beneficial microbial activity. Organic matter in soils is made up of plant and animal material that is in the process of decomposition.

Organic matter can be increased in pasture soils by having high perennial content, litter retention and sympathetic grazing strategies.

With increased organic matter comes healthier plants which are less stressed by nutrient deficiencies. This not only increases the vigour of the plants, but soil micro-organisms can become more active in the presence of an abundance of organic matter. For example, certain kinds of fungi that live in decaying organic matter have been found to kill harmful nematodes. Pastures and crops growing in a rich soil ecosystem are naturally more robust and more capable of handling the stresses of drought.

Soil testing is an important way to keep track of the health of your soil and identify nutrient deficiencies.

For information on opportunities to undertake training in soil testing techniques or to inquire about soil testing contact NSW Dept. of Primary Industries (See Pg 16 for details).

For more information see: "Soil Biology Basics" and "Organic Matter in Soils" NSW DPI at [www.nswdpi.gov.au](http://www.nswdpi.gov.au).

## Water Supply

A clean, reliable and adequate water supply is essential for the survival of stock during drought periods. Dams, bores, tanks can be suitable if they are managed correctly. If you are considering a dam or bore be aware that each state has its own legislation and licensing requirements. (ACT – Territory and Municipal Services, NSW – Dept Water & Energy, see Pg.16 for details).

A well developed farm plan should include careful consideration of well designed watering points for stock. Some things to consider when considering watering points for stock are:

- If possible stock should be excluded from waterways to protect riparian vegetation and water quality by providing off-stream watering points.
- Locate off stream watering points to limit paddock damage (eg. troughs are a place of high stock activity and will result in soil disturbance, erosion and high amounts of faecal matter.) Portable electric fencing and portable troughs can help manage these impacts.
- Provision of water points in all paddocks enables paddocks to be spelled easily.
- Consider portable troughs and electric fencing to increase the flexibility of stock movement.
- Stock access to dams should be designed to avoid stock getting bogged when water levels are low.

For further information see: Landcare Notes. "Drought Reserve Dams" State of Victoria, Dept of Sustainability and Environment. 2002; "Information About Dams – Water Resources Information Sheet 4" TAMS 2005. "Farm Dams-where can they be built without a license?" NSW Dept of Infrastructure, Planning and Natural Resources 2004; "Stock water – a limited resource, Prime Facts", NSW DPI

## Protecting your water resources

The dam or creek is the most popular spot with your stock and feral animals during a drought. But that may not be the best thing for the long term health of either the dam or the stock. While some level of disturbance from stock is unavoidable, stock cause bank erosion, soil compaction, bogging, and pollute the water with faeces.

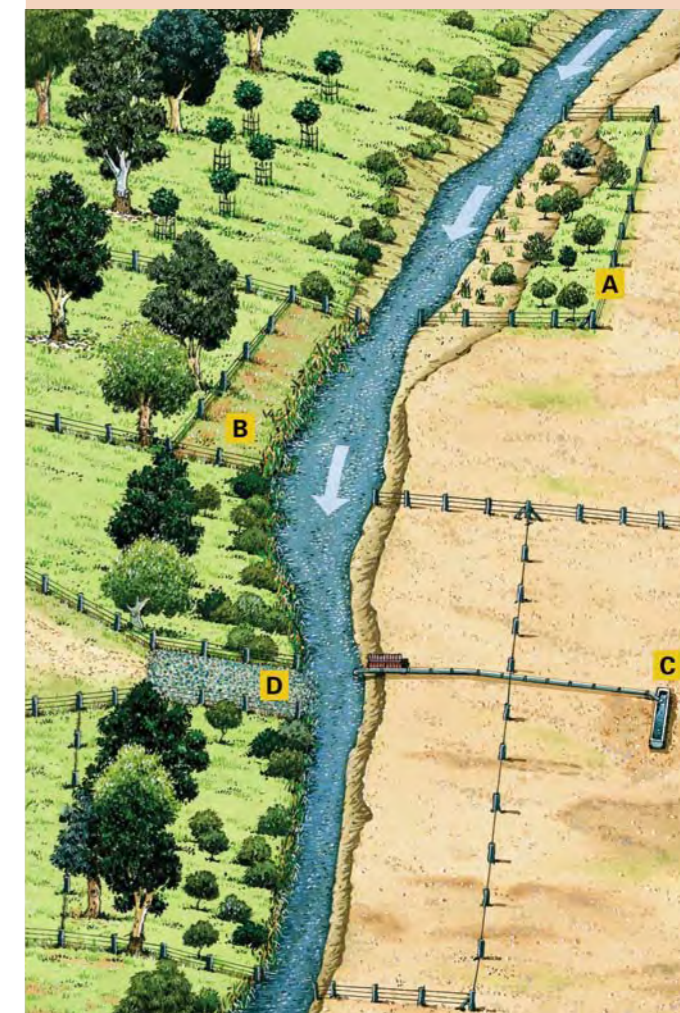
Water is your block's most precious resource in times of drought and needs to be protected.

Caring for Dams and Creeks:

- Fence stock out of these areas, installing instead pumps and troughs for stock water
- Alternately, provide stock access only at stabilised points
- Avoid herbicide, pesticide or fertilizer use near any body of water
- Revegetate wetlands and riparian areas, or allow them to regenerate to filter nutrients and silt when rain does fall
- Avoid removing trees and understorey from riparian areas, as this promotes soil erosion

Contact the NSW Department of Water & Energy, Greening Australia, or your local Landcare coordinator for information on grants and assistance with off-stream water provision and fencing.

For further information: "Stock and Waterways: A managers guide" and "Managing stock, Fact sheet 6" Land and Water Australia [www.rivers.gov.au](http://www.rivers.gov.au).



This diagram shows how different strategies can be used to manage different parts of your riparian land. Reproduced from "Stock and waterways: a manager's guide", copyright Land & Water Australia, 2006. Illustration Paul Lennon.

- A Stock have been excluded, and the area replanted to protect against erosion.
- B Stock have been excluded to allow natural regeneration to occur.
- C Off-site watering point to exclude stock from unstable stream bank.
- D Gravelled stock access point restricts access to a small, but stable area where damage can be controlled.

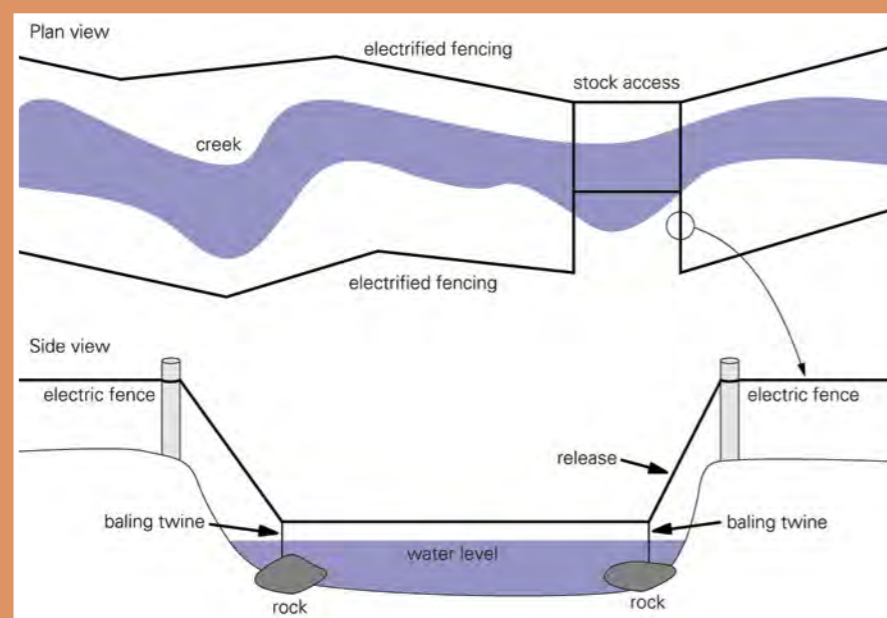
## The Stock Take a Drink

Drinking water requirements for stock will vary according to the weather, the quality and nature of their food supply, the water quality, the age and condition of animals, and even their social behaviour. Stock use roughly 50% more water during summer than winter and lactating stock will use even more.'

### Average Daily Water Consumption

Sheep	2-4L
Cattle	35-80L
Horses	40-50L

For further information see: Information Notes - "How Long Will My Dam Water Last?"; and "How Much Water Do I Need?" Department of Sustainability and Environment, Victoria. [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au). "Managing farm water supplies in drought" Dairy Australia, [www.dairyaustralia.com.au/files/Drought/managing\\_farm\\_water\\_supplies.pdf](http://www.dairyaustralia.com.au/files/Drought/managing_farm_water_supplies.pdf).



A diagram of Ken Lamb's simple, but effective, crossing/water access point, using single wire electric fencing. Reproduced from "Stock and waterways: a manager's guide", copyright Land & Water Australia, 2006.

Water is your block's most precious resource in times of drought and needs to be protected.



Photo: J. Morris

# Surviving Drought

Drought is an opportunity to put time into thorough site preparation while waiting for optimal planting conditions.



## Surviving Drought

### Looking After Your Trees

Drought makes growing healthy trees in this region all the more challenging.

Often, drought stress may not kill a tree outright, but set it up for secondary insect and disease infestations.

What a tree under "drought stress" looks like:

- Leaf losing lustre, changing colour then wilting, curling at the edges, and yellowing.
- Leaves may be smaller than normal, drop prematurely or remain attached to the tree even though brown.

Drought is an opportunity to put time into thorough site preparation while waiting for optimal planting conditions. If planting during drought is unavoidable, be prepared for a lower than normal survival rate. To help increase the survival rate, water young plants in well at the time of planting. However, in the

long term it is cheaper to replace trees that die than try to water regularly. Consider direct seeding as an alternative to planting tube stock; the seed can wait until rain falls and triggers natural germination.

Established native trees will often withstand drought, but can always use a little help. Eliminate stressors such as large masses of mistletoe, avoid cultivation near their base, fence out stock and avoid fertilizer to put them in better shape for survival.

*For further information see: "Caring for Trees in a Dry Climate" Victoria Department of Primary Industries. "Tree Management After Drought" NSW Department of Primary Industries*

### Avoid Stock Suffering During Drought

The care and wellbeing of animals is always of the utmost importance. In a drought particular attention must be paid to the welfare of stock.

Act early while stock are fit and strong to find alternative feed and water sources. Keep in mind that lactating stock need considerably more food and water. Constantly review feed requirements and plan your breeding programs accordingly.

Animal suffering is *not* an option and it is illegal to 'let nature take its course'. Stock must never be allowed to suffer and need to be fed, agisted, sold or humanely destroyed if no alternative can be found.

Because desirable pasture plants struggle in a drought it is more likely that animals will be tempted to eat weeds. Some weeds, such as Paterson's curse and Capeweed, can be toxic to animals. Know which weeds are toxic and control them before they become a problem.

*For further information see: "Primefacts - Animal Welfare in Drought" NSW Dept. of Primary Industries 2006. [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au); "Code of Practice for the Welfare of Horses" and "Code of Practice for the Welfare of Sheep", [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au).*



Photo: J. Morris

## Uncontrolled Grazing

The grazing pressure attributable to domestic livestock is added to by the grazing pressure of other animals such as kangaroos, rabbits and feral goats. The number of non-domestic animals on a property is usually underestimated.

Native grazers such as the Eastern Grey Kangaroo may adjust their population in response to drought. Older individuals can also become weakened and die. However, their populations can increase markedly once it rains and feed becomes readily available.



Feral hares not only increase grazing pressure, but also spread weeds.  
Photo: J. Morris

## Feral Species

Pest animals should be managed safely and humanely. State government departments can provide advice on the best way to manage pest animals on your property. They can also provide information about licensing requirements if culling is considered appropriate for your property size and location.

When planning animal control on your property, consider whether it is possible to target an area larger than just your property alone. Try to get a group of neighbouring properties to work together for a more lasting and cost effective result. Rangers with your local Rural Lands Protection Board (NSW) or Territory and Municipal Services (ACT) can provide information on planning, monitoring, free feeding, poisoning and other control strategies.

For further information see: "Controlling Vertebrate Pests After Drought" NSW Department of Primary Industries <http://www.agric.nsw.gov.au/reader/management-planning-recovery-/dai293.htm>.

## Supplementary Feeding

Supplementary feeding can be an excellent stop-gap measure and enables drought stressed paddocks to be rested. There are, however, drawbacks that need to be considered.

Long-term feeding of stock can be expensive and should only be considered for stock which have high value (such as horses, and breeding stock) or with whom you have a strong personal bond.

You should plan ahead for the possibility of supplement feeding (Eg. by buying feed before the prices rises and ensuring it's stored correctly so that it maintains its quality)

In times of severe drought, stock may also need a supplementary water supply. Carting water to a large number of stock is generally not a viable option.

Be aware of the source of bought stock feed so you can determine the potential for unwanted chemical residues, weed seeds, pests and diseases.

Potential drawbacks to supplementary feeds:

- Labour intensive
- Can be wasteful if not managed well
- Introduction of weed species
- High cost (in drought the cost of stock feed can more than double)

Any change in an animal's diet can adversely affect its digestive system. Start with small portions building up over one or two weeks. This will allow stock's digestive systems to adjust to the new feeding regime.



Stock feeders don't need to be high tech.  
Photo J. Harding

## Good Feed, Good Price, Good Management

Good feed management minimises wastage and gives better value for money by using the most digestible feeds and those high in protein and energy.

For example:

- In most cases hay is only appropriate for maintenance rations.
- During drought, stock require high energy feeds such as grains, rather than high protein feeds such as lucerne hay.
- Generally the greener the grass the higher its digestibility.
- Older animals may have worn teeth, inhibiting their ability to crop short or dry grass.
- Animals risk colic if their feed is placed on bare earth, due to ingestion of dirt and dust. Use stock feeders to minimise this risk and avoid wastage of feed.

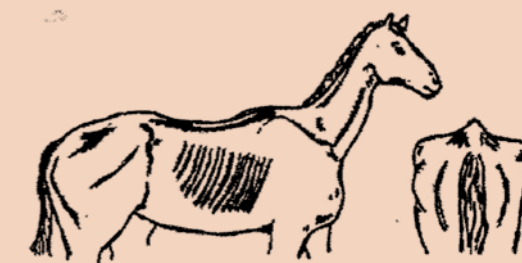
Knowing your stock as individuals can assist in optimum feed management. A general rule of thumb to assess an animal's condition is if you can see the animal's ribs it is considered in poor condition and higher quality feed is required.

Feeding an animal that is infected with internal parasites is also wasteful, so stock should be regularly treated for parasites. External stressors on stock will also lead to increased food requirements, so providing shelter from excessive wind, heat or cold will allow stock to make the most efficient use of supplementary feeds.

Maintaining condition on stock is the most cost effective way to approach supplement feeding. This is because it will take twice as much feed to increase the weight of a poor conditioned animal as it will take to maintain the weight of a good conditioned animal.

For further information see: NSW Dept. of Primary Industries publications, "Agfact A6.5.3-Practical Feeding of Horses" [www.rirdc.gov.au/agfacts/](http://www.rirdc.gov.au/agfacts/); "Drought Feeding and Management for Horses." David Nash.1999 and "Managing Drought Guide 2006" [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au).

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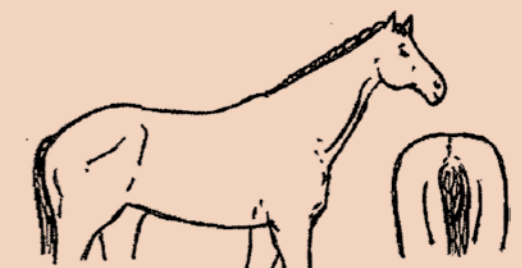
0. Very poor
- Very sunken rump
  - Deep cavity under tail
  - Skin tight over bones
  - Very prominent backbone and pelvis
  - Marked ewe neck



1. Poor
- Sunken rump
  - Cavity under tail
  - Ribs easily visible
  - Prominent backbone and croup
  - Ewe neck, narrow and slack



2. Moderate
- Flat rump either side of backbone
  - Ribs just visible
  - Narrow but firm neck
  - Backbone well covered



3. Good
- Rounded rump
  - Ribs just covered but easily felt
  - No crest, firm neck

Reprinted from: "Drought Feeding and Management for Horses." David Nash, 1999



Paterson's curse is not only a weed, it can be poisonous to stock.  
Photo: J. Harding

## Watch out for new weeds!

Supplementary fodders can contain seeds of weeds not currently present on your property. It is best to determine the source of the fodder or grain so that potential problems can be anticipated. Restrict the area over which imported fodder will be fed out and where stock can distribute seed via faeces. Monitor these areas over the long term for any weeds that emerge. If you have trouble identifying a weed, seek help from your local shire council weeds officer or agronomist.

Correct grazing management is critical in controlling weeds. Weeds like mustard weed, thistles, African lovegrass, serrated tussock, capeweed and Paterson's curse thrive in over grazed paddocks. Reduced grazing pressure will often allow grasses to re-establish sufficiently to provide competition against weeds. Hand removal and chipping of selected species can be preferable to herbicide use and is often quite feasible on a small holding.

For help call your local council weeds officer.

For further information see: Weeds Australia, [www.weeds.org.au](http://www.weeds.org.au).



Blue green algae blooms can be dangerous for stock and domestic water supplies.  
Photo: R. McConville

## Attack of the Pond Scum!

Blue-green algae are a natural part of aquatic systems. Under normal conditions they cause few problems, but conditions of high temperatures, low flow, high nutrient levels (mostly phosphorus and nitrogen) and increased light penetration into shallow water can promote algal blooms. These blooms can cause unpleasant smells and tastes in the water and can produce a variety of toxins that can affect the livers, nerves and even skin of both stock and humans. Blue-green algae toxins can persist for weeks and are a potential health risk to both animals and humans, particularly if they are swallowed. Dogs are particularly susceptible to these toxins, and should never be allowed to swim in farm dams experiencing algal blooms. Not all algal blooms are harmful, but if you are concerned about an algal bloom, restrict stock access and domestic supply.

Algal blooms not only produce toxins, but often use all the available oxygen in the system, causing large scale fish kills.

Keep an eye on dams, especially during drought, and inform Territory and Municipal Services (ACT) or Dept. of Water & Energy (NSW) of suspicious algal blooms.

Algal blooms can largely be prevented by following the general recommendations for dam and creek care, such as excluding stock (see Pg. 7 For details).

If an Algae Bloom Occurs:

- Exclude stock, pets and humans from the waterway.
- Get professional identification, testing and advice.
- Only attempt chemical treatment after seeking appropriate professional advice.

For more information see: Information Notes "Minimising algal growth in farm dams." Dept of Sustainability and Environment, Victoria, [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au); "River flows and Blue-Green Algae - Fact sheet 10" Land and Water Australia [www.rivers.gov.au/acrobat/facts10.pdf](http://www.rivers.gov.au/acrobat/facts10.pdf); Algae & Algal Blooms found in NSW Wetlands, NSW Dept. of Natural Resources, [www.dnr.nsw.gov.au/water/wetlands\\_facts\\_algae.shtml](http://www.dnr.nsw.gov.au/water/wetlands_facts_algae.shtml)

Not all algal blooms are harmful, but if you are concerned about an algal bloom, restrict stock access and domestic supply.

## Sacrifice Paddocks

Replanting a pasture can be prohibitively costly. To avoid this cost stock must be removed when pasture survival is threatened. One paddock, or defined area, can be sacrificed to protect the balance of the pasture. This sacrifice paddock should be selected based on its slope and vegetation, since in all likelihood it will be completely denuded and at risk of erosion when the drought breaks. The capacity of a paddock to respond after the drought breaks is important, so good candidates are paddocks with weeds or a high percentage of annual species with a good soil seed reserve, set back from any water course or dam. By placing all stock in the sacrifice paddock feeding supplements and fodder will be simplified and it will be easier to control the spread of weed seeds that may be introduced in supplementary feed.



Sacrifice paddocks can help protect existing pastures.  
Photo: J. Harding

## SO IT'S A DROUGHT:

### What are the opportunities?

Just because a drought is on, it doesn't mean things stand still on the block. There is a lot to do while you wait for rain.

- De-silt dry dams
- Mend or relocate fences
- Fence out riparian areas for better management
- Prepare sites for future tree planting
- Review water requirements and supply
- Review carrying capacity and livestock enterprise
- Remove woody weeds
- Reduce fire hazards
- Control feral animals
- Repair contour banks
- Undertake management on usually inaccessible areas (Eg. water logged)



## Recovering from Drought



Photo: J. Morris

Pastures respond rapidly after drought due to a sudden increase in nitrogen in the soil.

# Recovering from Drought

### Helping Your Grass Bounce Back

Pastures respond rapidly after drought due to a sudden increase in nitrogen in the soil. This is not, however, normal growth rates for grasses and will stabilise after a few months.

After good rain and before implementing recovery plans, it is essential to assess how drought has affected your pastures. The survival and subsequent growth of both grasses and legumes will be variable and influenced by:

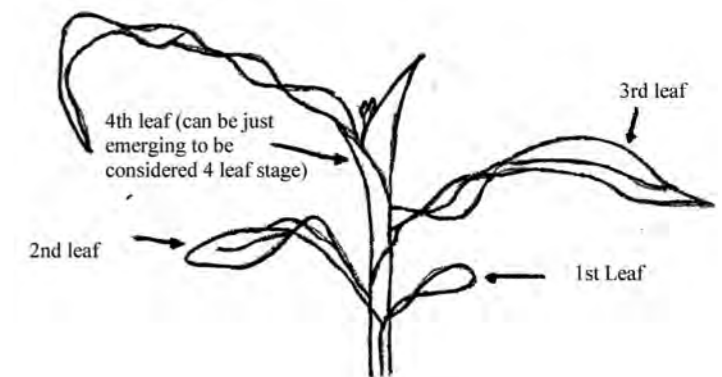
- total rainfall and rainfall incidence,
- season in which the drought breaks,
- pasture composition,
- soil type, slope and aspect,
- type of stock and stocking rate,
- grazing management,
- pasture pests,
- pasture health before the drought.

Check the paddocks after growth has begun and assess which species are recovering most vigorously. How susceptible a paddock is to erosion also needs to be assessed based on soil type, ground cover, slope and likely rainfall intensity. For example, areas with more bare ground and greater slope, will require the most attention.

Pastures then need to be valued in terms of their cost to replace. Perennial pastures are very expensive and risky to re-sow, and native pastures in many cases can't be re-sown.

Grazing should be delayed until pastures have recovered. This can be seen as:

- Four leaf growth stage (fig 1).
- Grasses approximately 8cm high.
- Ground cover in general has increased.
- Ideally, grasses should be allowed to come to full flower and set seed before they are grazed again.

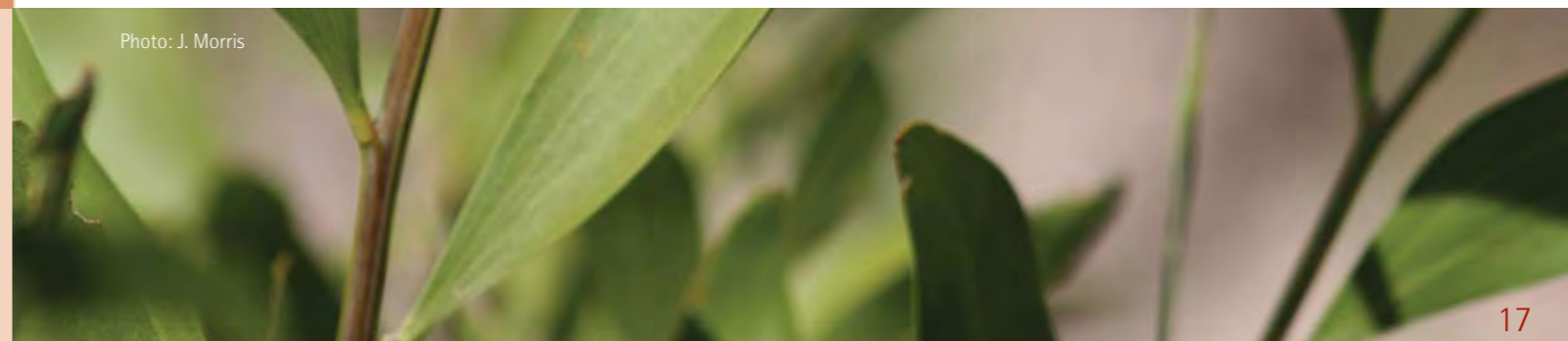


As a rule of thumb if pastures have not recovered well in 6-8 weeks this may be an opportunity to resow pastures, or other renovations should be considered.

Beware that your pasture is not the only thing that will start to grow when the rain comes. Weeds can grow at a rapid rate and it is important to manage weed infestations before they become a major issue and potentially out-compete more desirable plants.

For further information see: "Running a Small Beef Herd", Wallis, Cheryl, 2002 ISBN: 0731148606; Prime Facts. "Managing Pastures After Drought." and "Drought Feeding and Management for Horses." Nash, David, 2005, NSW Dept of Primary Industries, [www.dpi.vic.gov.au](http://www.dpi.vic.gov.au)

Photo: J. Morris



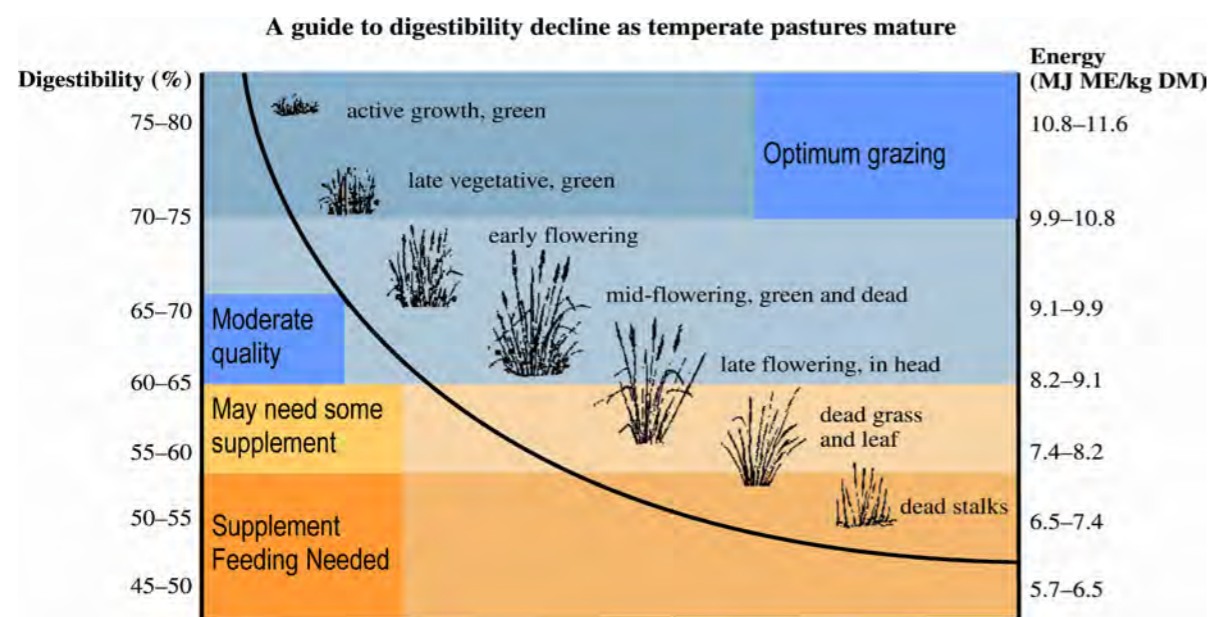


Photo: J. Morris

## Beware of "Green Pick"

When the drought is over, pastures must be rested to recover. Grazing the 'green pick' shortly after rain can use up the final reserves of drought affected grass or destroy emerging seedlings. Continue to use paddocks that have already been denuded or are of lesser value as a "sacrifice paddock" until pastures are growing vigorously again.

The 'green pick' after rain can be dangerous for stock. During periods of drought the amount of nitrate in the soil increases. In the first week after rain nitrate uptake by plants may increase significantly. High levels of nitrates in plants can cause nitrate and nitrite poisoning in stock. Hungry stock are at the greatest risk because they will consume more toxic feed and, in the case of ruminants, their guts have not had time to adapt to converting the nitrate into harmless ammonia. Other sources of nitrogen/nitrite poisoning are mouldy hay and some weeds such as Capeweed. Signs of nitrite poisoning usually appear 6-24 hours after the toxic material is consumed.

Signs of nitrate poisoning (less severe) are:

- diarrhoea and vomiting;
- salivation;
- abdominal pain.

Signs of nitrite poisoning (more severe) are:

- rapid, noisy and difficult breathing;
- blue/chocolate-coloured mucous membranes;
- rapid pulse;
- salivation, bloat, tremors, staggering;
- weakness, coma, terminal convulsions, death.

Hungry stock should never be introduced to fresh feed. Continue with supplement feeding for some time after fresh food is available to help with the transition.

For more information: M. Offord, 2006, Plants Poisonous to Horses - An Australian Field Guide, [www.rirdc.gov.au/eshop](http://www.rirdc.gov.au/eshop)

## Restocking after Drought

After a long dry period and possibly the loss of stock, rebuilding a herd or flock can bring challenges, including disease, and the introduction of parasites and weeds. It is best to be conservative in restocking to allow pastures time to recover their full potential.

The health and vigour of purchased stock is important. If unsure about the health of stock for sale seek advice. All new stock must come with vendor details and appropriate animal health declarations, NLIS (National Livestock ID scheme) details.

On arrival, consider:

- Treatment of internal and external parasites.
- Vaccinations.
- Quarantining to limit spread of weed seeds and to enable monitoring of the health of the animals.
- Visual inspection for weed seeds on coats/hair.

For further information see: NSW Dept of Primary Industries website [www.dpi.nsw.gov.au/agriculture/emergency/drought/recovery](http://www.dpi.nsw.gov.au/agriculture/emergency/drought/recovery) for a series of PrimeFacts including, "Managing and planning drought recovery", "Animal health matters", "Pasture and crop considerations".

For advice on stock health issues contact ACT- Territory and Municipal Services, NSW – Rural Lands Protection Board (see Pg.20 for details).

## Where to from here?

Drought and post-drought conditions can provide opportunities to reflect, reassess and plan the management of your block. For example; if your property has been de-stocked this can provide increased opportunities to change your type of stock regime, or to move to agistment or fodder production?

The post-drought to-do list:

- Re-evaluate your farm plan.
- Check dams after heavy rain – often they have had silt and animal droppings washed into them, affecting water quality.
- Monitor pastures and tree lots for insect damage.
- Check fences (especially along streams), levy banks, gullies for damage and erosion after heavy rain.
- Re-establish pastures.
- Identify and manage active and potential erosion sites.

## FOR INFORMATION AND ADVICE

### NSW Government Departments

NSW Dept. Primary Industries – Drought Hotline

1-800-814-647 and [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)

NSW Rural Lands Protection Board – [www.rlpb.org.au](http://www.rlpb.org.au)

Rural Fire Service NSW – [www.bushfire.nsw.gov.au](http://www.bushfire.nsw.gov.au)

Murrumbidgee Catchment Management Authority –

[www.murrumbidgee.cma.nsw.gov.au](http://www.murrumbidgee.cma.nsw.gov.au)

### Local Government

NSW Shire Councils – <http://www.dlg.nsw.gov.au>

Territory and Municipal Services – [www.tams.act.gov.au](http://www.tams.act.gov.au)

### Federal Government Departments

Land & Water Australia – [www.lwa.gov.au](http://www.lwa.gov.au)

### Community Groups and Non-government Organisations

Ginninderra Catchment Group

Greening Australia – [www.greeningaustralia.org.au](http://www.greeningaustralia.org.au)

Landcare Australia Ltd – [www.landcareonline.com](http://www.landcareonline.com)

Molonglo Catchment Group – [www.molonglocatchment.com.au](http://www.molonglocatchment.com.au)

Southern ACT Catchment Group – [www.sactcg.org](http://www.sactcg.org)

Upper Murrumbidgee Catchment Coordinating Committee

Waterwatch Program Upper Murrumbidgee

### Other

CIT Rural Training Centre – [www.cit.act.edu.au/rural](http://www.cit.act.edu.au/rural)

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The Upper Murrumbidgee Catchment Coordinating Committee (UMCCC) brings together local government, community groups, and relevant ACT and NSW government agencies in the Upper Murrumbidgee Catchment with an interest in natural resource management (NRM). The Committee provides a network for the exchange of information, ideas and experiences and facilitating awareness about regional NRM issues.

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