

Planning for drought

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Six steps to making a drought plan

We all know there will be another drought. It will be managed best if you have a well-considered plan. There are six steps to making a plan for the next drought.

1. Identifying how and when climatic variation will threaten your enterprises.
2. Analysing the local climate to find the chances of this threat occurring.
3. Identifying what to monitor, and selecting trigger points.
4. Making an action plan to follow triggers.
5. Budgeting for these actions and assessing the costs of **not** acting.
6. Setting a time for reviewing this plan as your situation changes.

This level of planning concentrates on setting broad strategies for the next drought. The finer details, such as least-cost feeding rations, will need to be worked out using current prices at the time. See:

- Feed cost calculator www.dpi.nsw.gov.au/reader/choosing-feeds/dai201b and;
- Primefact 356 *Feed cost calculator instructions*

1. Identifying enterprise risk

First, assess your current enterprises and resources to identify the likely impact of drought (see Auditing the farm's resources www.dpi.nsw.gov.au/reader/auditingresources). To work out where you are at risk, estimate the critical time(s) for rainfall and the absolute minimum amounts of rain that will be needed in order to keep operating. You will need to do this for each of your enterprises and for your major resources of pastures and soils.

The critical time for rainfall is often **before** the 'products' of an enterprise show stress, and can depend on what the subsoil moisture levels are likely to be, as well as the likely amount of current-season rain. For example:

- In south-western NSW, a property mainly in livestock would find the late spring critical in providing carry-over feed for the normally dry summer, although the critical time may not be until early autumn.
- In south-eastern NSW, early autumn might be critical for pasture growth before the usual cold winter, but the feed limitation might not be obvious until late winter.
- A property in southern NSW that is mainly involved in cropping is likely to need rainfall in spring for crops to finish well. Planting time and early growth periods during late autumn to early winter may also be critical.
- In northern NSW, a property involved in summer cropping would have critical times that are different from those of a Northern Tablelands livestock property.

Each farm will need minimum amounts of rainfall at various times to keep functioning normally. Anything less than the minimum will mean a drastic change of plans. The amount and timing of critical rain will be different for each property, depending on the specific crops, stock enterprises and pasture types.

A good planning tool is to list your major farm enterprises, the months of the year during which they are at risk, and how much rain is the absolute minimum you could get away with during the risk time.

2. Analysing climate records

The task here is to find out what risk your enterprises face. After you have identified the critical times for your farm enterprises, and estimated the rainfall needed for successful production, you can use climate records to analyse when and how often things may go wrong. For the enterprise risks you have outlined in Step 1, you



need to find out (from whichever records you search):

- **drought frequency** – how often has the essential rain failed to come?
- **Duration** – how long do low-rainfall periods last on average?
- **seasonality of droughts** – are they more likely at a particular time of year?

There are computer programs such as Australian Rainman® and MetAccess® designed to perform analyses such as these. For example, you might consider that '2/3 of median rainfall for July to October' presents a serious risk. From the graph below, generated by the Australian Rainman® computer program, you will see that it occurred 25 times in 122 years (about 1 year in 5). Twice it has turned up for three years in a row, but there have been gaps of over 10 years. There is no reason to believe that the amount of variation we get in rainfall in the future will be different from the variation we have had in the past. The extremes will come along about as often and be about as large, although the details may change slightly.

You may need to search historical rainfall records yourself. You might highlight areas in a listing such as that shown in Table 1 on the following page. This listing shows that the rainfall in late winter and spring has been poor for 2 years in 16 (a record covering a longer period of time would define the risk even more clearly):

Forecast tools

It is necessary to decide whether or not the following indicators can be used to help you assess the drought risk in your situation:

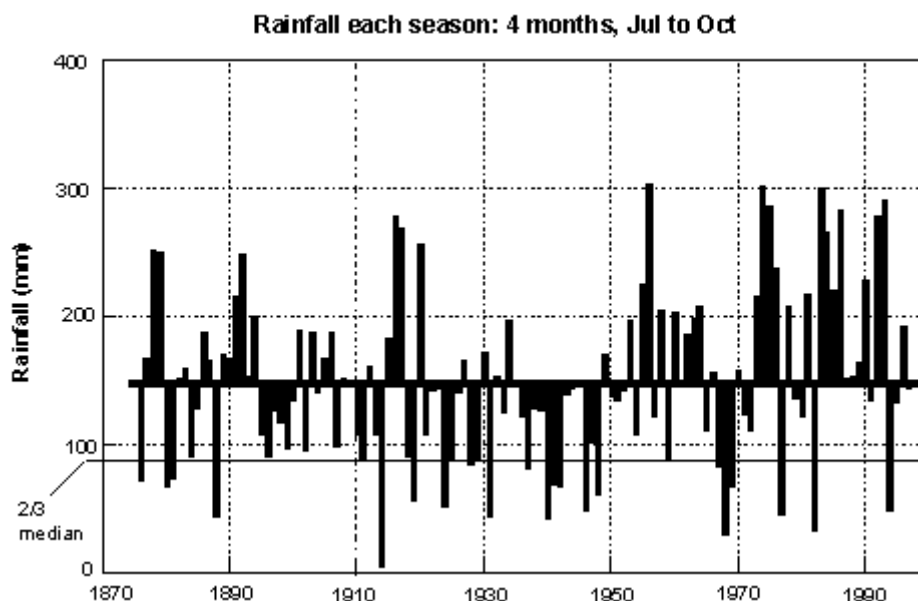
- **southern oscillation index (SOI)** – is the SOI closely linked to rain in your area at your risk time?
- **sea surface temperatures (SST)** – do SSTs help to indicate the chances of rain?
- **seasonal forecasts** – have they been accurate for you in the past?

You will need to check some historical records of these and compare them against your local rainfall. Some may help you put more accurate odds on whether the next risk season is likely to be good or bad – they may help you to make a more accurate assessment than if you were to rely only on the average of the historical records.

The use of these forecast tools is not always appropriate for every district, so you will need to check their usefulness for your location. The Australian Rainman® computer program will help you to check the application of the SOI in forecasting the chance of rain for your district. (For further information on the SOI, SST and seasonal forecasts, see Primefact 378 *Assessing future enterprise risk – the medium-term climate outlook*.)

Having checked when your enterprises are most at risk from low rainfall, and looked at records to find the historical risk, you can assess how vulnerable each of your enterprises is. This will define the scale of any problem and provide some hints about when and how often the problem might confront you.

The next step is to decide what you need to watch out for that would alert you to the fact that the situation is becoming critical.



Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1976	48	26	14	8	10	7	11	22	59	146	23	7	381
1977	8	53	57	15	82	48	9	5	20	11	13	2	323
1978	89	0	61	57	171	87	32	30	111	34	39	69	780
1979	15	3	27	54	64	50	8	42	46	40	21	0	370
1980	14	5	32	55	39	41	35	48	20	18	7	89	403
1981	5	131	19	9	50	66	117	34	41	26	26	27	551
1982	29	0	45	3	25	31	3	0	23	6	0	0	165
1983	0	28	86	73	130	53	77	99	49	75	41	34	745
1984	187	21	9	74	7	0	100	74	32	60	18	0	582
1985	9	0	20	57	54	30	14	93	52	62	50	60	501
1986	28	3	2	14	76	17	68	69	60	85	35	63	520
1987	2	17	9	31	32	114	38	43	36	34	8	18	382
1988	45	5	27	21	130	54	75	21	49	9	64	83	583
1989	7	0	175	61	65	53	43	67	29	26	34	4	564
1990	29	118	6	126	48	9	78	67	54	30	0	2	567
1991	20	0	6	9	28	61	51	18	58	8	3	15	277

Table 1. Rainfall in late winter and spring has been poor for 2 years out of 16.

3. Identifying what to monitor, and selecting trigger points

This is where you decide when to take some action to relieve the effects of the developing drought. As well as monitoring rainfall directly, you need to monitor the physical factors critical to your enterprise. These are the factors that respond to rainfall and which you are likely to check as part of enterprise performance monitoring. They might include the following.

- **Pastures and soils limits.** Pastures and soils are the bases for future production. You need to set limits on how much degradation you can accept before some action needs to be taken to protect them. Indicators you might use are:
 - percentage ground cover
 - kilograms dry matter per hectare (kg DM/ha)
 - percentage green
 - percentage weed.

See Assessing pasture in drought.
www.dpi.nsw.gov.au/reader/assesspasture

- **Stock condition.** This is usually measured as body weight or fat score. You need to set acceptable minimums, below which there would be severe impacts on the enterprise, either

during drought or during the recovery time.

These minimums will vary according to the production targets you have set for each group of livestock. For each group, you should nominate the number of stock reaching the limit, which will then trigger action.

See Assessing animal condition in drought
www.dpi.nsw.gov.au/reader/assessanimalcond

- **Water.** You must decide when your water quantities, qualities and water support equipment (windmills, pumps, troughs or bores) will become a limit to production. Identify when you will need to take some action to correct or overcome these limitations.

See: Water use efficiency
www.dpi.nsw.gov.au/reader/irrigation-water-use-efficien, and Primefact 326 *Water requirements for sheep and cattle.*)

- **Cropping.** Some critical decisions must be made before a crop is put in the ground. When the crop is in and up, you can assess when it is being stressed by drought, but finding actions to relieve or recover the situation may be difficult. What limits can you put on the following before some action or decision is required?

- subsoil moisture
- sowing rains
- cut-off sowing date

- plant densities
- wilting.

See WaterWise on the Farm
www.dpi.nsw.gov.au/reader/waterwise-briefs

4. Developing an action plan to follow triggers

You need to develop some clear action plans to follow on from defining and monitoring the trigger points you have selected in Step 3.

The most difficult decisions involve livestock. Cropping tends to have more 'yes/no' decisions, but in stock management there are a wide range of choices – see Primefact 307 *Drought strategies for the livestock producer* and Primefact 279 *Drought hints*.

Your choices need to be clarified into a plan of what you intend to do when your critical trigger points are reached. This is usually a very stressful time, and having a logical prepared plan in place beforehand will make decisions easier and clearer.

You need to specify the resources you will need in order to complete your plan when the time comes:

- **Identifying resources.** Feeds and water on hand – assess what you have and what you could need. What strategies can you use to access the difference?
- **Cash or liquid assets that can be put towards drought survival.** These may be an alternative to storing fodder, giving you the capacity to buy when needed, as well as providing for personal spending over the time when income will be affected.
- **Credit limits you have or would set for yourself.** You need to know what your limits are and decide how much of your credit you are willing to put towards drought survival.

See Auditing the farm's resources
www.dpi.nsw.gov.au/reader/auditingresources, and
 Financial considerations in drought.
www.dpi.nsw.gov.au/reader/drtfinancial

5. Financial analysis

You will need to calculate the total cost of your planned actions (see Primefact 307 *Drought strategies for the livestock producer*, and Financial considerations in drought www.dpi.nsw.gov.au/reader/drtfinancial). As well as costing the plan, you should do a brief analysis of the financial consequences of both acting at the trigger point when it turns out that it was unnecessary (i.e. the **weather** does not follow your plan) and of **not** acting at the trigger point but the drought continues (i.e. **you** don't follow your plan). These are the alternative outcomes to your action

plan. Costing them identifies the riskiness of the plan you have in place.

Many farm managers delay decisions for fear the action decision will be wrong ('it might rain tomorrow'). With current weather forecasting skills it should be possible to assess the potential for drought-breaking rain up to 1 week ahead. This means your action will not be proved wrong for at least a week. Calculate the cost of rebuilding all your enterprises starting a week after you take a forced action.

6. Reviewing the plan

You need to regularly review your final plan (at least once every 5 years) as technology, markets and legal controls change. You will need a new drought action plan if your enterprises or resources change significantly.

Computer programs

Australian Rainman[®] is available from:

Queensland Department of Primary Industries and Fisheries via the web address
www2.dpi.qld.gov.au/rainman

MetAccess[®] and GrazFeed[®] are available from:

Horizon Technology Pty Ltd
 PO Box 598
 Roseville NSW 2069
 Phone (02) 9805 1941
 Fax (02) 9887 4428

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Check for updates of this Primefact at:
www.dpi.nsw.gov.au/primefacts

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