

Recovering from Drought

Management considerations for the Grains Industry



The aim of any post-drought cropping program is to restore cash flow as soon as possible. Management strategies that ensure your business is in the best position to be able to capture rainfall when it falls and convert that rainfall to grain are critical to recovery.

This document has been prepared to help producers make informed decisions on how to effectively manage their business through the drought recovery phase. This document is not designed to provide a comprehensive analysis of all drought recovery options, but will provide an overview of the strategies that producers should consider when planning for recovery. Producers should always seek further advice relevant to their situation.

Fallow Management

Good fallow management is critical to ensuring you are able to make the most of the rainfall when it falls. Management strategies should focus on maximising the capacity of the soil to store water and minimising the loss of soil water once it enters the soil. There are a number of factors that influence the ability of the soil to capture and store rainfall including; rainfall intensity and amount, ground cover, soil surface conditions and fallow weed management.

Rainfall intensity & volume

High intensity rain and lack of ground cover can result in significant runoff and erosion. Having well maintained contour banks, waterways and drainage lines will help to manage water flow and minimise potential erosion.

Ground cover

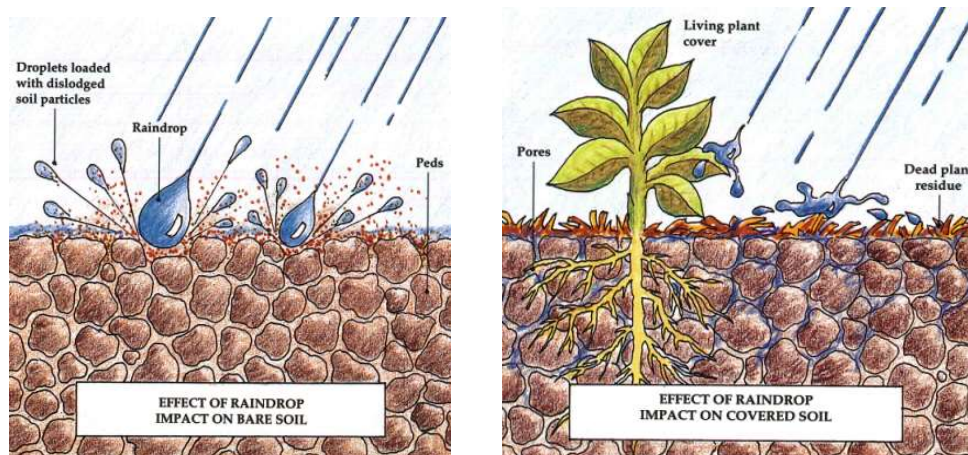
Stubble is KING! Management strategies should focus on ensuring you can achieve at least 30 per cent ground cover throughout the entire year. When ground cover levels fall below this threshold, the runoff and erosion risk increases substantially. Retaining stubble cover reduces the rate at which runoff occurs and therefore allows more time for rainfall to enter the soil. Strategies that can improve ground cover include:

- *Cover cropping.* Cover crops are crops planted for the purpose of improving cover rather than producing yield, and have the potential to increase fallow water storage and improve subsequent crop performance. Planting a cover crop should be considered when stubble levels are low in order to increase the rate of soil moisture storage and therefore return to cropping as quickly as possible.
- *Crop Selection.* Where ground cover is low, plant a crop that produces high stubble cover. Cereals like wheat and sorghum produce a larger volume of longer lasting stubble in comparison to oilseed and pulse crops.

Soil surface condition

Ground cover protects the surface soil from the impact of raindrops, which can seal off soil pores that normally let rainfall in. In the absence of adequate ground cover, tillage may be required to develop surface roughness to break up the sealed layer and allow more rainfall to be stored.

In a low cover situation, tillage will also have an added benefit in terms of fallow weed control. Timely operations that ensure successful control of weeds when they are small prevents soil moisture use by weeds rather than the subsequent crop.



Source: "Understanding soil ecosystem relationships", DPI&F Qld, 1992

Crop Management

In order to respond in a timely manner when the rain does fall and put yourself in the best position to establish and grow a harvestable crop, some pre-planning is critical. There are a number of management decisions that need to be considered and acted on early to ensure you are able to maximise your crop yield after drought.

How do I know when to plant a crop?

Assessing stored soil moisture levels

Making regular assessments of the moisture profile prior to planting is critical to determine the point at which planting a crop is likely to produce a successful crop. While it might be tempting to plant on the first rain after a prolonged drought, planting on marginal moisture presents an unnecessary risk in terms of potential for crop failure. You will need to ensure you have enough moisture to produce a harvestable crop in the absence of follow up rain. This will ensure you put yourself in the best position to get a crop to harvest and generate some much-needed cash flow. Using a push probe and taking soil cores at depth are recommended methods of assessing soil moisture.

How do I maximise yield after drought?

Planting Seed

The quality of retained planting seed will depend on the storage conditions, the state of the seed post-harvest and the length of time in which the seed was stored.

It is critical that you test your retained seed for germination and vigour to ensure you put yourself in the best possible position to establish a crop. Testing your seed early, will also ensure that you have

time to plan alternative options should your seed be lower quality than expected. If the break in the drought is widespread, demand for seed can be high which means you may not be able to source a suitable variety or crop species unless you place your seed order early.

Basic germination tests can be done on-farm by collecting seeds and placing them in moist/warm conditions (i.e. moist paper towel in a sealed bag) for a number of days before counting the percent that germinate. The preferred method however is that you send samples away to registered laboratories for comprehensive testing.

Crop Selection

Residual stubble cover and reliability are the most important considerations when it comes to selecting the most appropriate crop post-drought.

- While it might be tempting to grow higher value crops such as chickpea and mungbean, crops such as wheat and sorghum will provide greater benefit in terms of residual ground cover.
- Don't grow crops that you have no experience in growing, even if the price is attractive. The first post-drought crop is not the time to take unnecessary risk. Choose a crop that suits your soil and land types and that you know has yielded reliably in the past.
- In a mixed enterprise, it may be worth including a forage or dual purpose crop option on less productive country. If the season doesn't produce adequate in-crop rain there is the potential to utilise as fodder.

Impact of residual herbicides

Residual herbicides applied in the previous crop or during the fallow period could potentially have extended activity due to slower rates of breakdown in dry weather. This can then cause unexpected damage to subsequent crops.

Hand sowing a few seeds in the paddock you intend to plant and observing establishment is an effective method for determining residual herbicide activity. The presence of susceptible weed species emerging in previously treated areas may also provide an indication of residual herbicide activity.

Nutrition

Understanding the nutrient status of your soils and having a realistic expectation of yield is critical in determining crop fertiliser requirements. It is recommended that you conduct soil tests (particularly for nitrogen and phosphorus) to the depth of the crop root zone (0-10cm, 10-30cm, 30-60cm) and seek agronomic advice on how best to approach your post-drought nutrition management.

When it finally rains following prolonged dry conditions there is the potential for an increase in nitrogen mineralisation. The amount of rain received early in the break will determine how much of this mineralised nitrogen is available at planting. It is also possible that there may be some carryover nitrogen fertiliser available if the previous seasons crop was low yielding or a complete failure. This means that it can often be difficult to predict residual soil N at planting without recent soil tests to work from.

Long fallow disorder can be an issue on soils low in phosphorus with a weed-free fallow longer than 8-12 months. Long fallow disorder is a result of depleted Versicular Arbuscular Mycorrhizza (VAM) levels in the soil which have a role in supporting crop nutrient uptake. If you have low phosphorus

soils and think you are at risk of long fallow disorder, consider planting a non-VAM dependant crop and apply starter fertilisers containing phosphorus and zinc to the first crop. Long fallow disorder can significantly limit yield if not managed.

Biosecurity considerations

Once it has rained it is important to check for emergence of new weed species. Weed seeds may have been transferred on-farm through contaminated fodder or movement of machinery (harvesters, earthmoving equipment) from other regions. Early detection and management is critical. Your local agronomist or biosecurity officer can assist with weed identification.

Planning for the next dry

- Forward planning in preparation for the next drought will help reduce the adverse effects of drought and improve your resilience through drought.
- Make time to document your experiences from the drought response and recovery phases. Memories are short, and documenting your learnings will help focus and refine business management strategies in future drought events.
- If you don't have one already, develop a drought management plan. This plan should take into consideration long-term business structure and goals, financial position, human resources etc.

For further information, please contact your local Department of Agriculture and Fisheries extension officer, call us on 13 25 23 or follow us on Facebook at Queensland Agriculture.