

3-PART WEBINAR SERIES

Making profitable management decisions after the dry

Key management considerations for grain producers



Today's Presenters



Rod Collins

Team Leader, Sustainable Grains Practices

Department of Agriculture & Fisheries

rodney.collins@daf.qld.gov.au



James Hagan

Economist, Broadacre Farming Systems

Department of Agriculture & Fisheries

james.hagan@daf.qld.gov.au

Key Considerations

Restore cash flow – obvious, but how?

1. Fallow management – focus on capturing rainfall
2. Working out when to plant – maximising the chance of crop success
3. Maximising crop yield – critical agronomic decisions

Fallow Management

- Rainfall intensity and duration influences erosion potential
 - Heavy rainfall is a major risk, yet part of our environment
 - Ensure contour banks and waterways are effective and maintained
 - Manage woody weeds and monitor contour entry points
 - Check bank height and avoid channel blockages





Calibrated FOOTS Field Observation Of Transported Sediment

Source: B. Carey, DNR

Fallow Management

- Type of rainfall events received is important
 - Less than 12mm: significant evaporation loss if no follow up within 3-4 days
 - 12 – 50mm: potential to add to stored soil moisture but losses can still occur
 - More than 50mm: can improve stored moisture but serious erosion risks
- Only 20 –30% of rain that falls ends up stored in the soil!
- Evaporation is a major source of losses, especially on very dry soil profiles and when rainfall amounts are low and infrequent

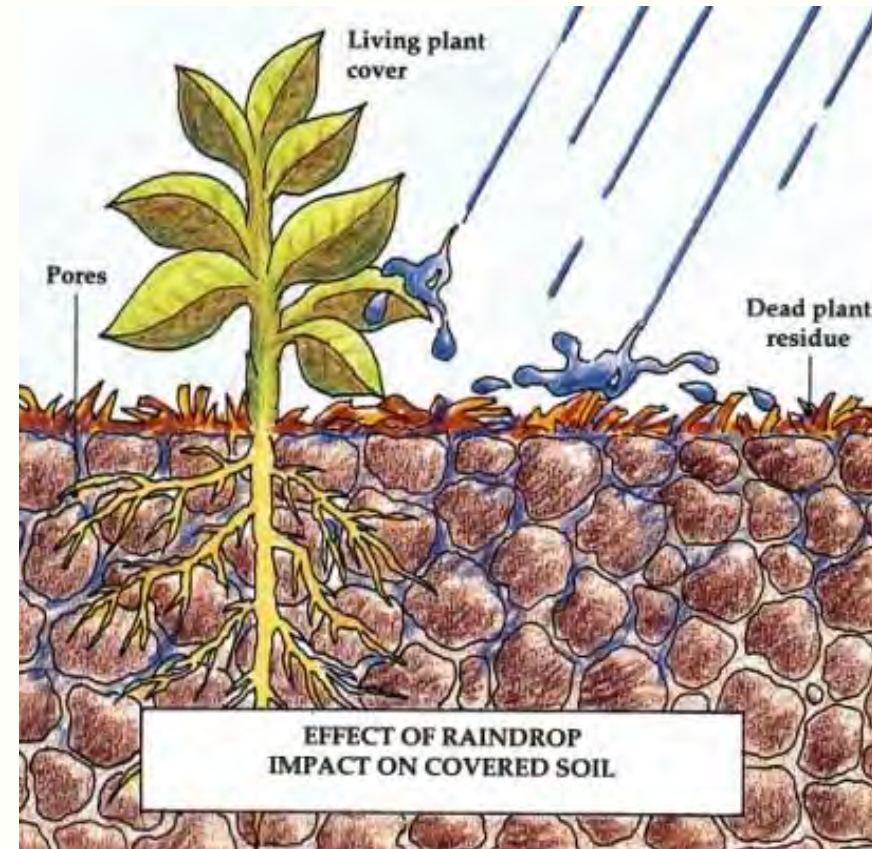
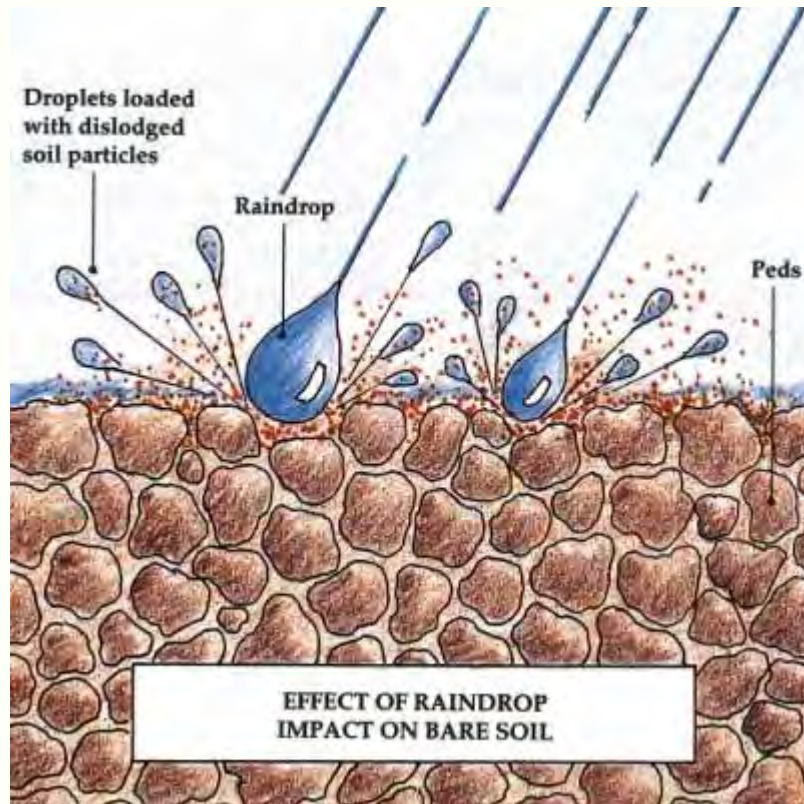
Fallow Management

- Groundcover – need to capture what rain that does fall
 - **STUBBLE IS KING** – do whatever you can to increase stubble cover
- Ensure weeds are well managed to preserve stored moisture
- Aim to maintain cracking in clay soils
- Too much tillage increases compaction and further reduces infiltration
- Surface roughness can help in the absence of stubble when surface sealing occurs
- Consider cover cropping to build stubble cover
- Crop type influences stubble persistence – legumes/oilseeds vs cereals

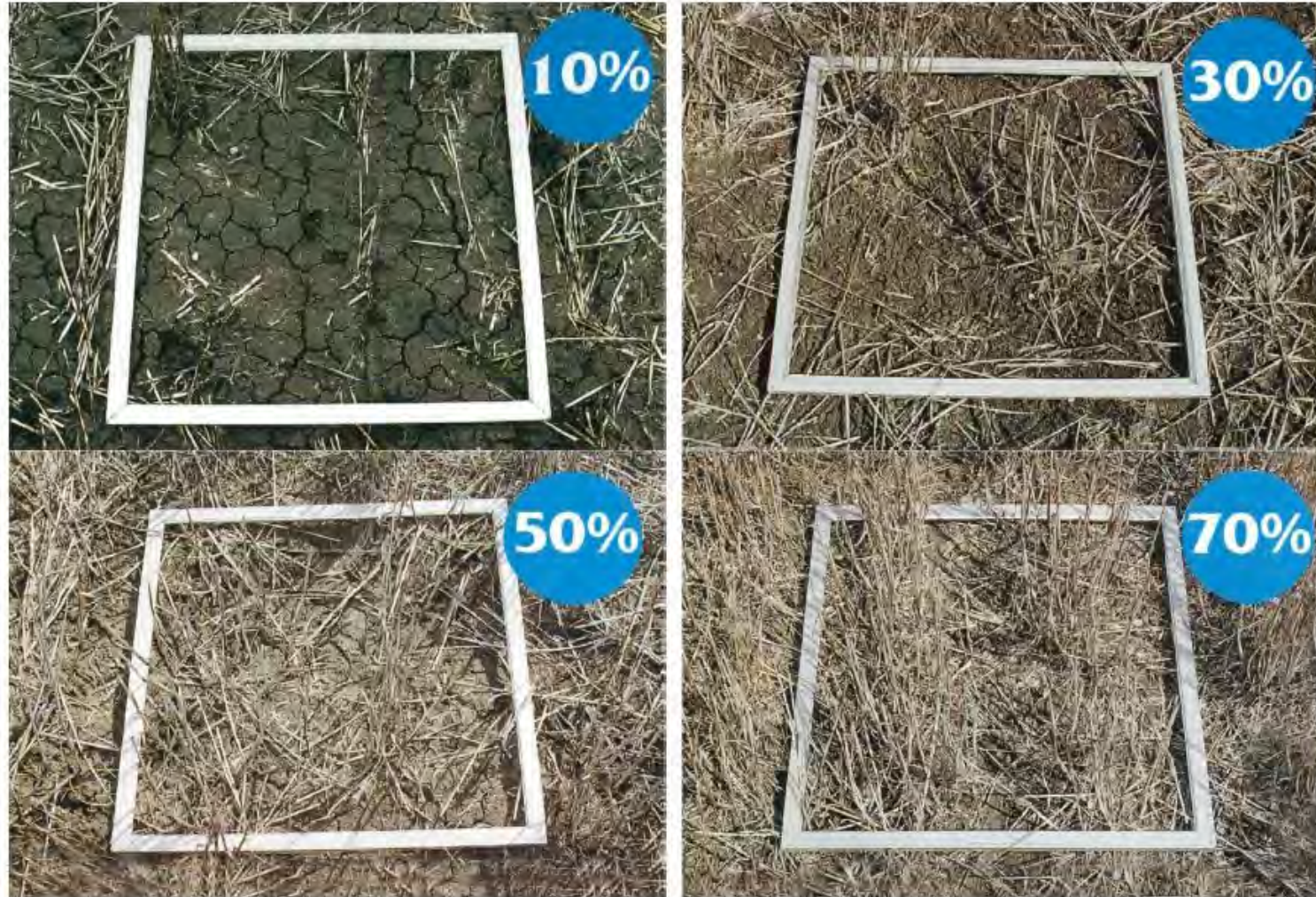
Low cover means slow soil moisture storage
and increased runoff and erosion.....



Groundcover = Infiltration

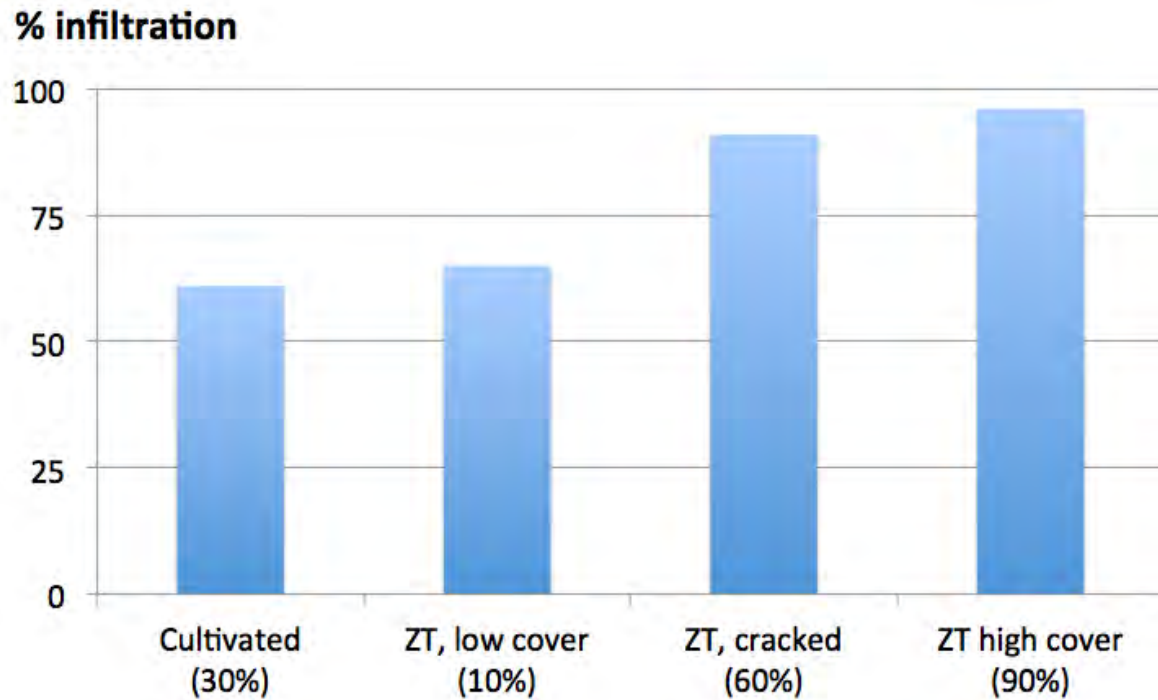


How much cover do I need?

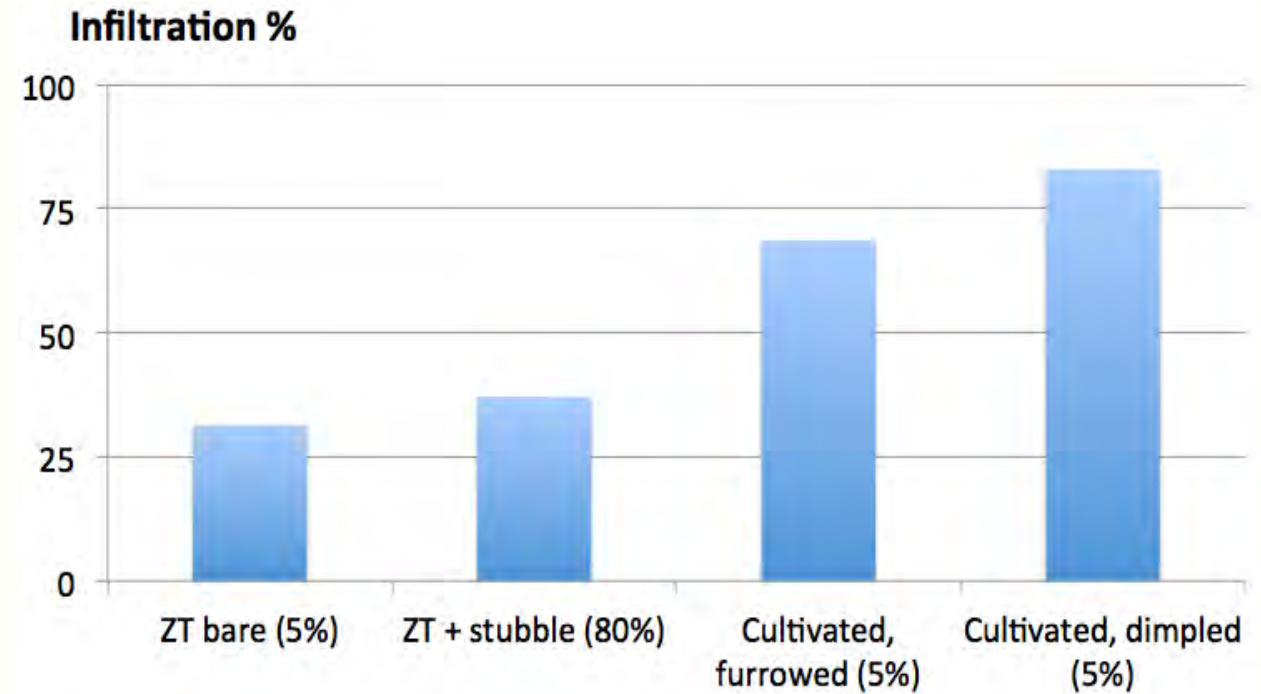


Soils Differ

Infiltration on a Brigalow-belah clay near Wallumbilla (Cawley et. al 1992).



Infiltration on a red brown earth near Goondiwindi (Cawley et. al 1992).



What about weeds?

- As a rule of thumb if weeds (eg; summer grasses) have 8 days to establish, they can then grow at 2-3 centimetres a day. Therefore they are depleting our stored reserves (below 10cm) after 12 days.
- Weeds can be a serious cause of water loss within a crop and fallow - up to 5 mm/day. It is essential that weeds be controlled while they are small to avoid use of soil water and seed setting

Assessing stored soil moisture

- Stored moisture is the key to crop success
- Avoid the temptation to plant on the first heavy rain, as there may not be enough stored moisture to guarantee a successful crop
- Need to regularly assess changes over time
- A push probe is adequate for making planting decisions
 - Avoid just digging with a screwdriver or your boot!

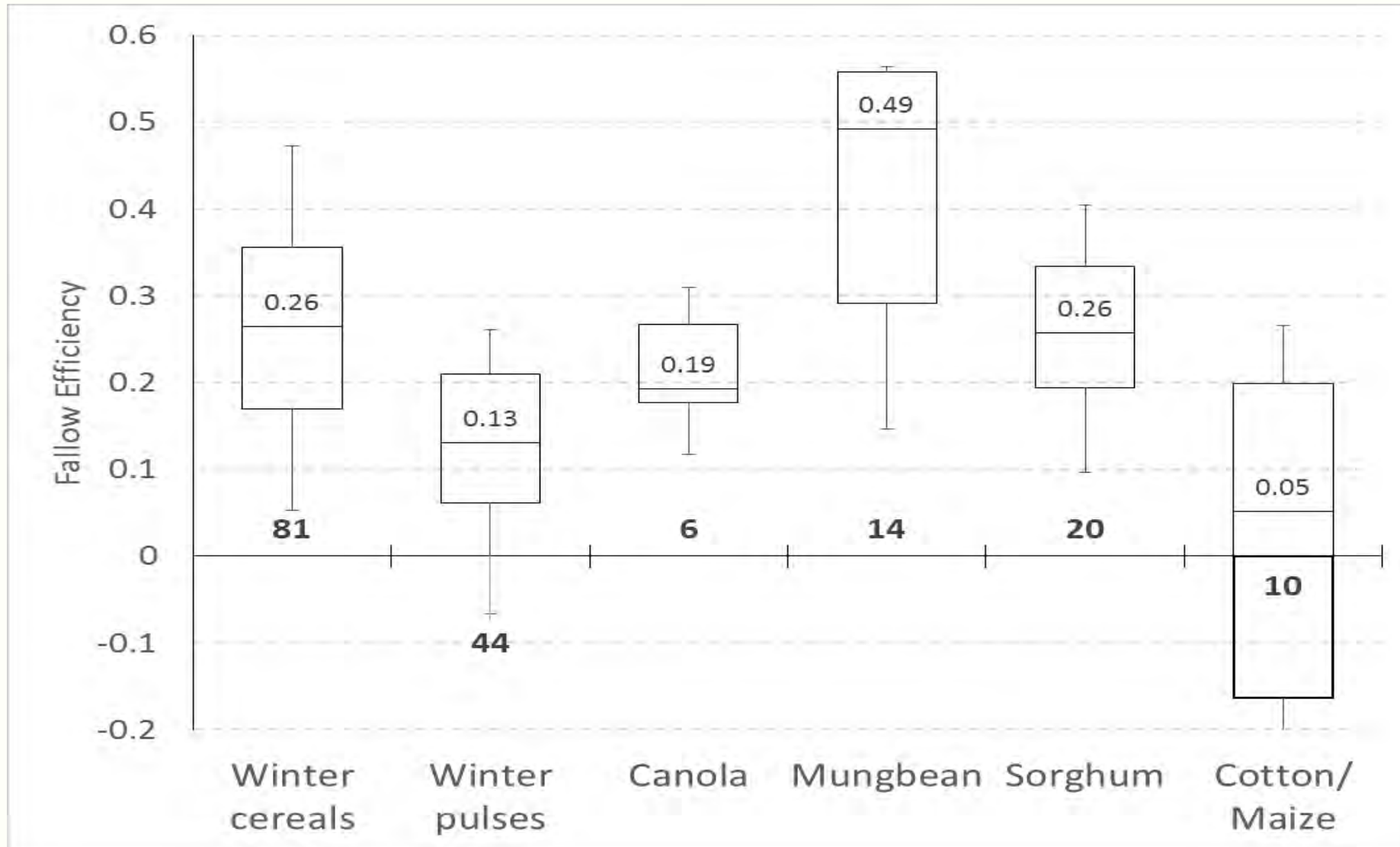
Stubble/cover (30%+)

- Protects the soil
- Maximises infiltration
- Slow surface evaporation
(for ~3 weeks after rain)

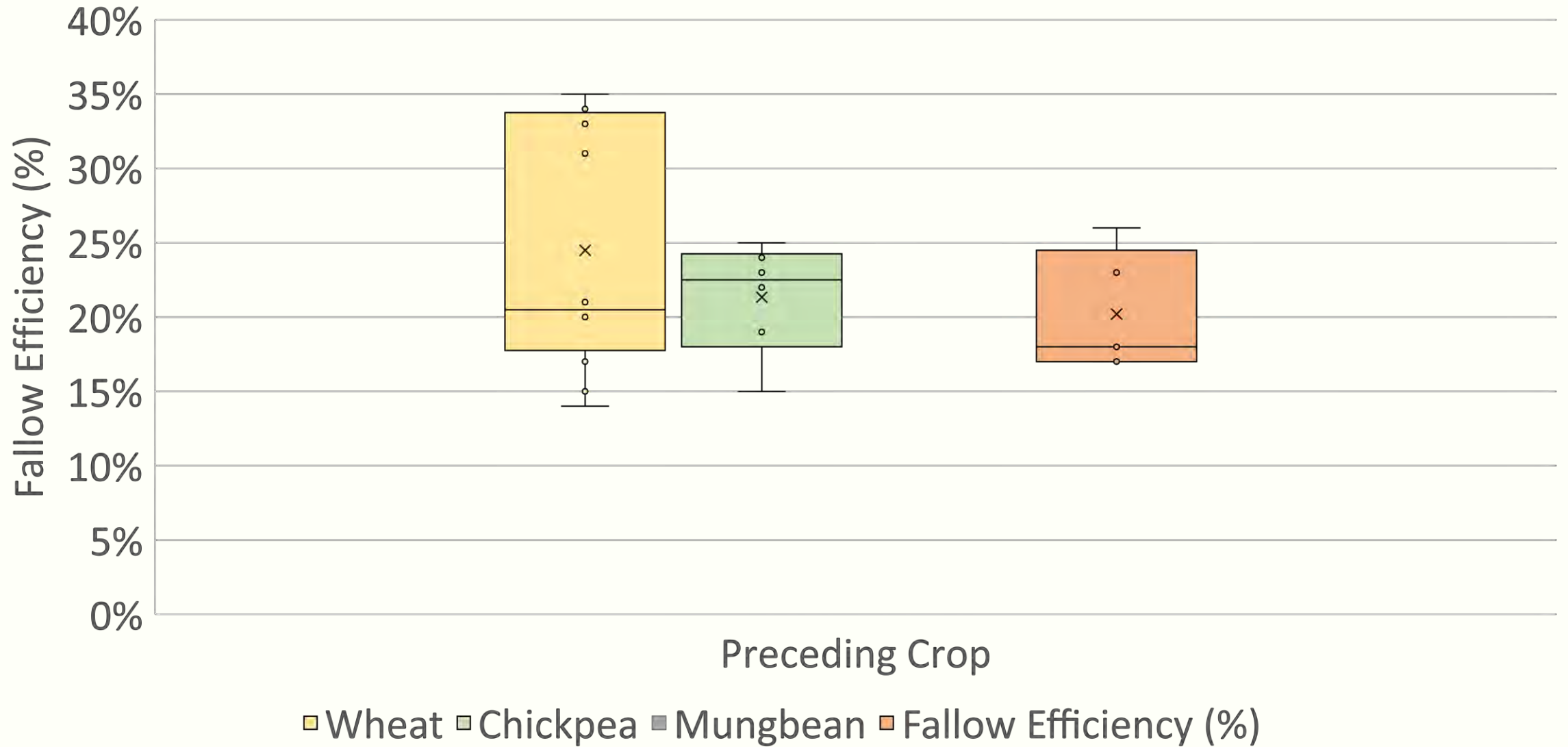
So, can boost stored water if there is more rain before soil dries out



Existing fallow efficiencies (GRDC farming systems, Northern Region)



Crop Fallow efficiencies (GRDC farming systems, Emerald)



Soil water – Bungunya

Millets at termination and 27 March



Bare



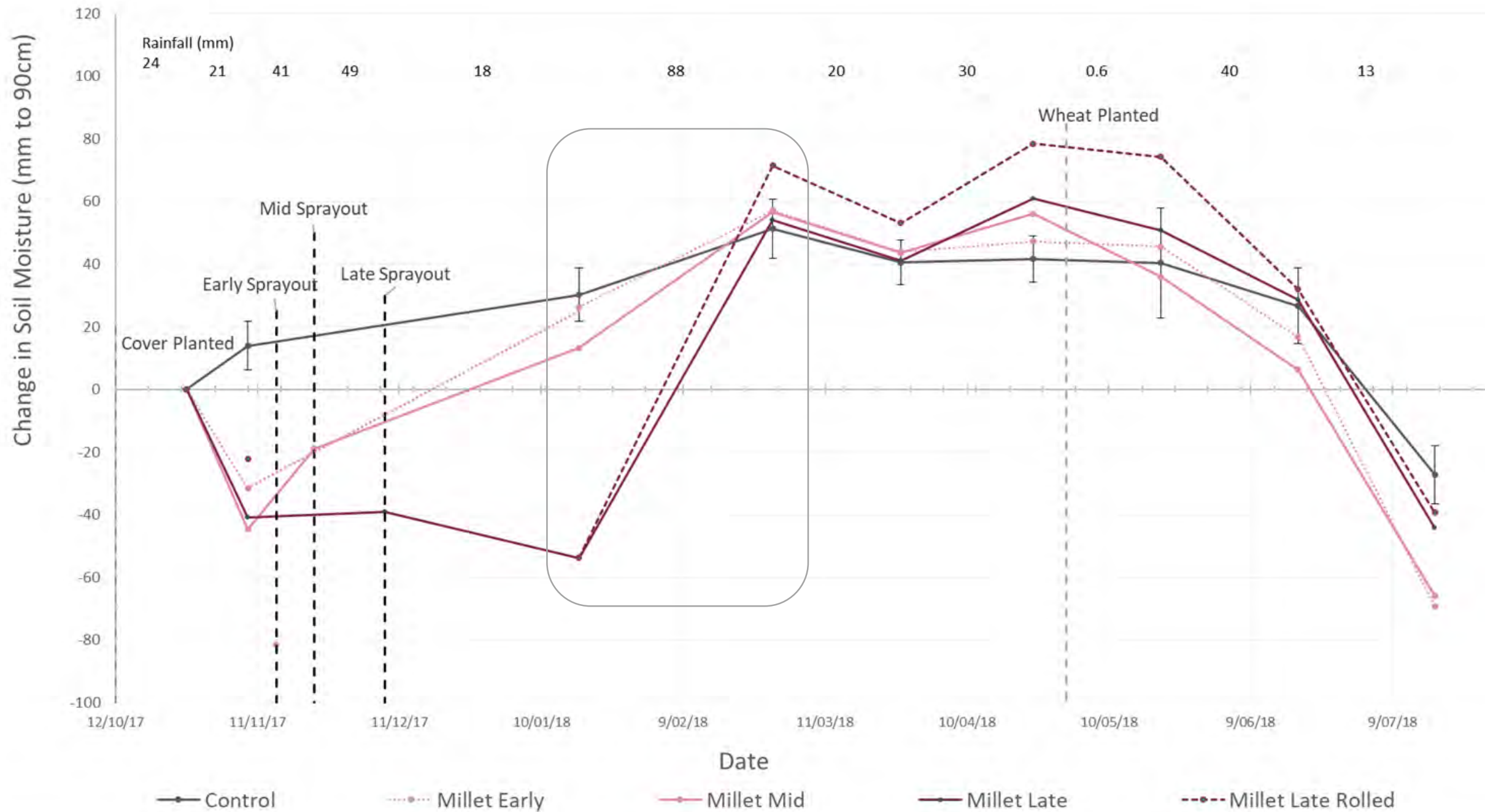
Mid

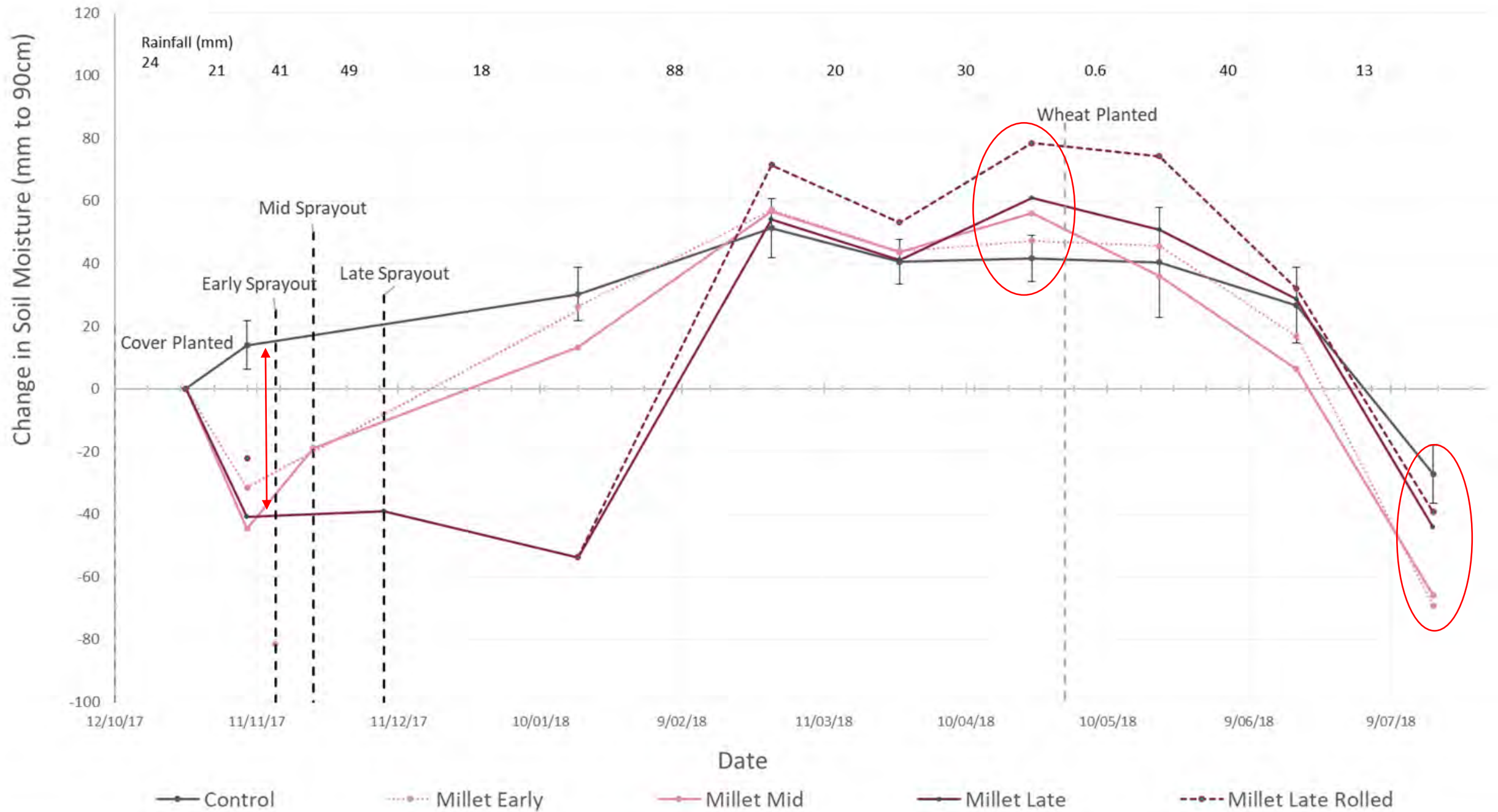
Late



Early







Measured Cover Crop Fallow Efficiency

	Yelarbon	Bungunya
Early Sprayout	53%	38%
Mid Sprayout	50%	48%
Late Sprayout	77%	64%

Establishment

Bare fallow



Lab Lab cover



Millet cover



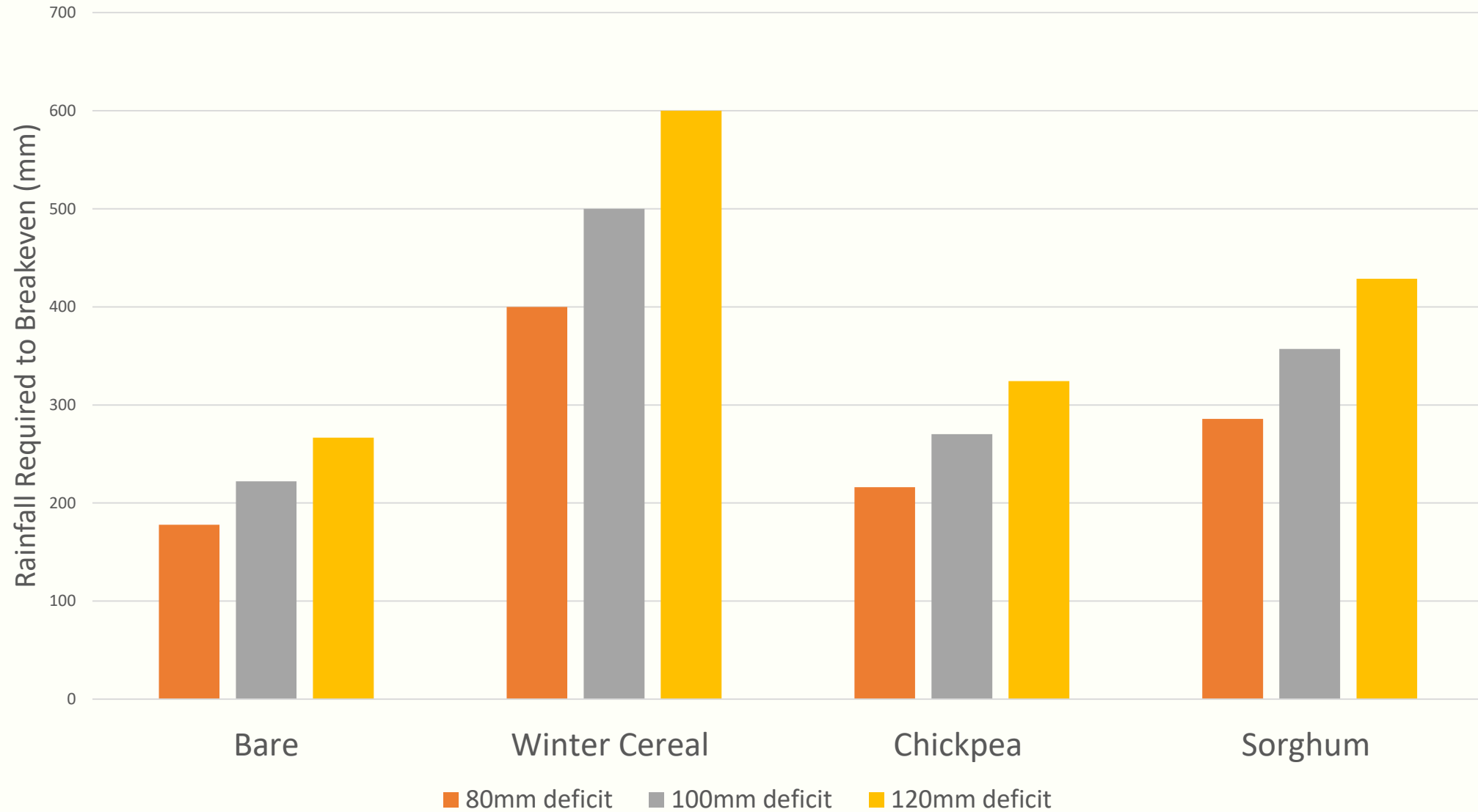
Establishment (\$/ha)	Spray Out (\$/ha)	Total (\$/ha)
\$50	\$20	\$70

What do you need to grow to recoup \$70/ha?

Grain price of \$300/t, \$70 = ~230kg Grain

To grow 230kg at WUE of 12kg/mm need to store 20mm of additional water

Cover Crop Fallow Efficiency of 50% vs Existing Stubble



Cover Crop

- Fallow Efficiency : 50%
- Mid Termination Water Deficit: 100mm

Fallow Stubble Type	Cover Crop Fallow Efficiency Benefit	Rainfall Needed for CC to break even?	Likelihood of this rainfall
Bare / Cotton	45%	~220 mm	???
Winter Cereal / Sorghum (Solid)	24%	~420 mm	???
Winter Pulse / Sorghum (Skip)	37%	~270 mm	???

How's the
Season?

How Often?

How
Wet/Nitrate?

Potential Yield?

Drought?

How Hot/Cold?

How Likely?

How's El Nino?

How's the Past?

What Trend?

Version: 2.0.7087.25880
Dated: 13/12/2019

How often?

Q How often do we receive...

Rainfall	more than	200mm
over a		197 day period
at		BILOELA DPI
between	15	November
and	30	May
for years		1990 to present

A In 97% of years.



30 of 30 years,
1.3 times/yr

Times > 200mm Rainfall occurs over 197 Consecutive Days, 15 Nov-30 May (198 days)
BILOELA DPI

How's the Season?

How Often?

How Wet/Nitrate?

Potential Yield?

Drought?

How Hot/Cold?

How Likely?

How's El Nino?

How's the Past?

What Trend?

Season?

How Often?

How Wet/Nitrate?

Potential Yield?

Drought?

How Hot/Cold?

How Likely?

How's El Nino?

How's the Past?

What Trend?

Version: 2.0.7097.25880
Dated: 13/12/2019

How often?

Q How often do we receive...

Rainfall more than 300mm
over a 197 day period
at BILOELA DPI
between 15 November
and 30 May
for years 1990 to present

AUSTRALIAN
ClimiMate

A In 77% of years.



24 of 30 years,
1.0 times/yr

How often?

Q How often do we receive...

Rainfall more than 450mm
over a 197 day period
at BILOELA DPI
between 15 November
and 30 May
for years 1990 to present

AUSTRALIAN
ClimiMate

A In 32% of years.



10 of 30 years,
0.4 times/yr

Times > 450mm Rainfall occurs over 197 Consecutive Days, 15 Nov-30 May (198 days)
BILOELA DPI

Take Home Messages

- Ground cover (stubble) is KING!
- Need to capture as much rainfall as possible
 - Infiltration, stubble cover, surface condition, evaporation
- Avoid loss of moisture via weeds
- Ensure adequate stored moisture prior to planting
- When ground cover is <20% it is likely to be profitable to improve ground cover via cover crops.

Maximising Crop Yield

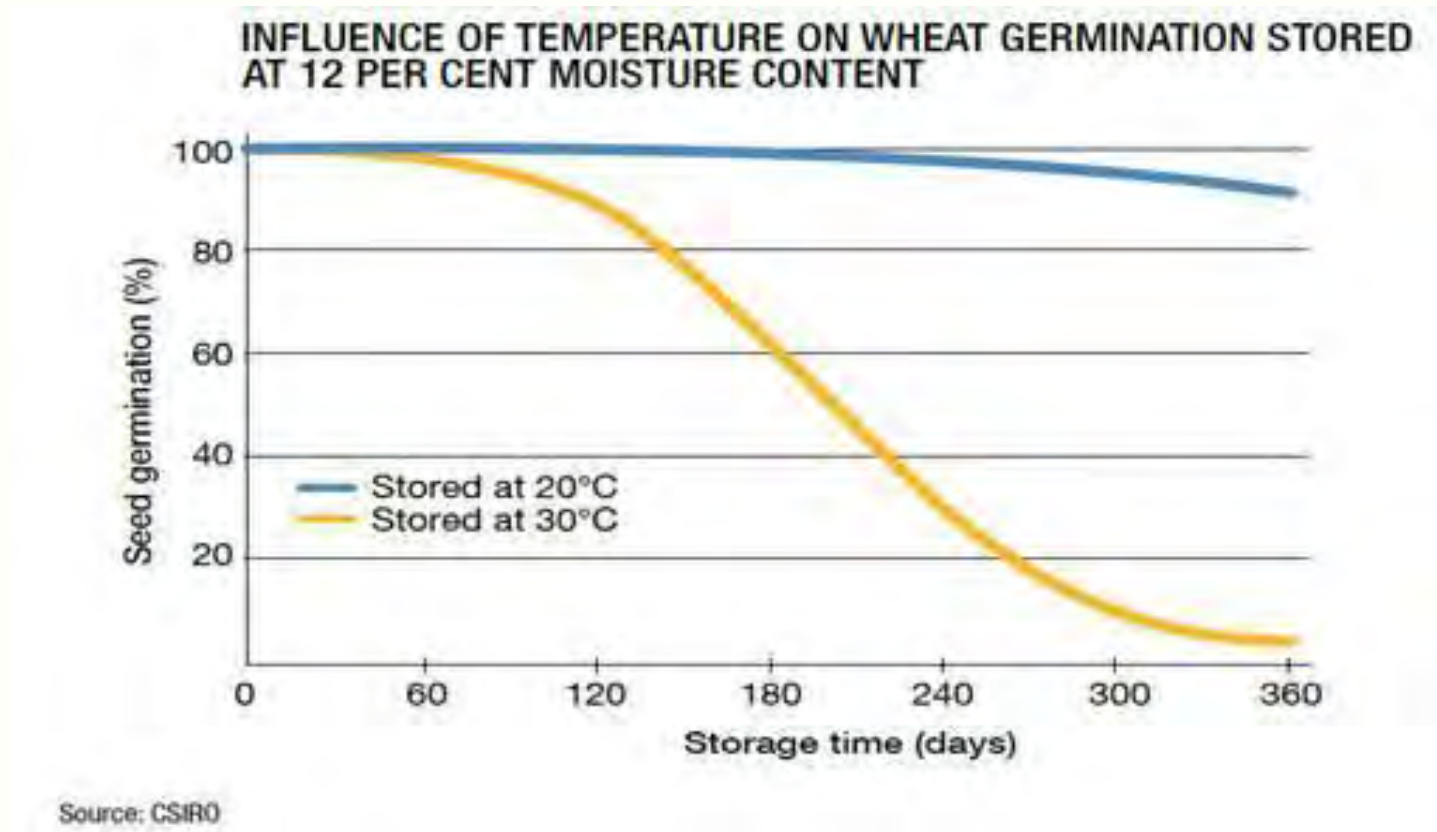
- Do I have enough moisture to produce a harvestable yield?
- What crop will give me the best chance of achieving this?
- What decisions do I need to make to give the crop the best chance to reach potential?

Crop Selection

- Highest \$/t does not always mean greatest \$return/ha!
- Balancing risk vs cash flow needs
 - What are the likely crop input costs?
 - Relative reliability of producing a harvestable yield?
 - What experience do I have in growing the crop?
 - What alternative approaches are possible - fodder vs grain
- Consider likely contribution to stubble levels after harvest
 - Pulses and oilseeds vs. Cereals

Before you plant

- If using seed stored on-farm for some time, check germination (total %) as well as vigour (rate of germination) and % abnormal



Before you plant

- Avoid planting at the edges (or outside of) regional planting windows
 - Potential yield is limited if you plant outside of these times
 - Crops will maximise kg grain/ha/ mm of water when planted in the middle of the planting window
 - Sometimes the 'best' approach is to wait for the next window
- Consider the impacts of using residual herbicides in the fallow
 - Prolonged dry weather can extend the activity of some products
 - Seek agronomic advice if you are unsure
 - Are susceptible weeds germinating?
 - Bio-assay with a susceptible crop species

Before you plant

- Fertiliser strategy
 - Soil testing is important to determine what is required
 - Prolonged dry conditions will reduce nitrogen accumulation (mineralisation)
 - Consider potential long fallow disorder impacts on phosphorus and zinc requirement
 - How much can I afford to not recoup from this crop? (note it may not be lost but available to subsequent crops)
- Biosecurity
 - Weed seeds in planting seed and in flood water
 - Early detection and removal is critical

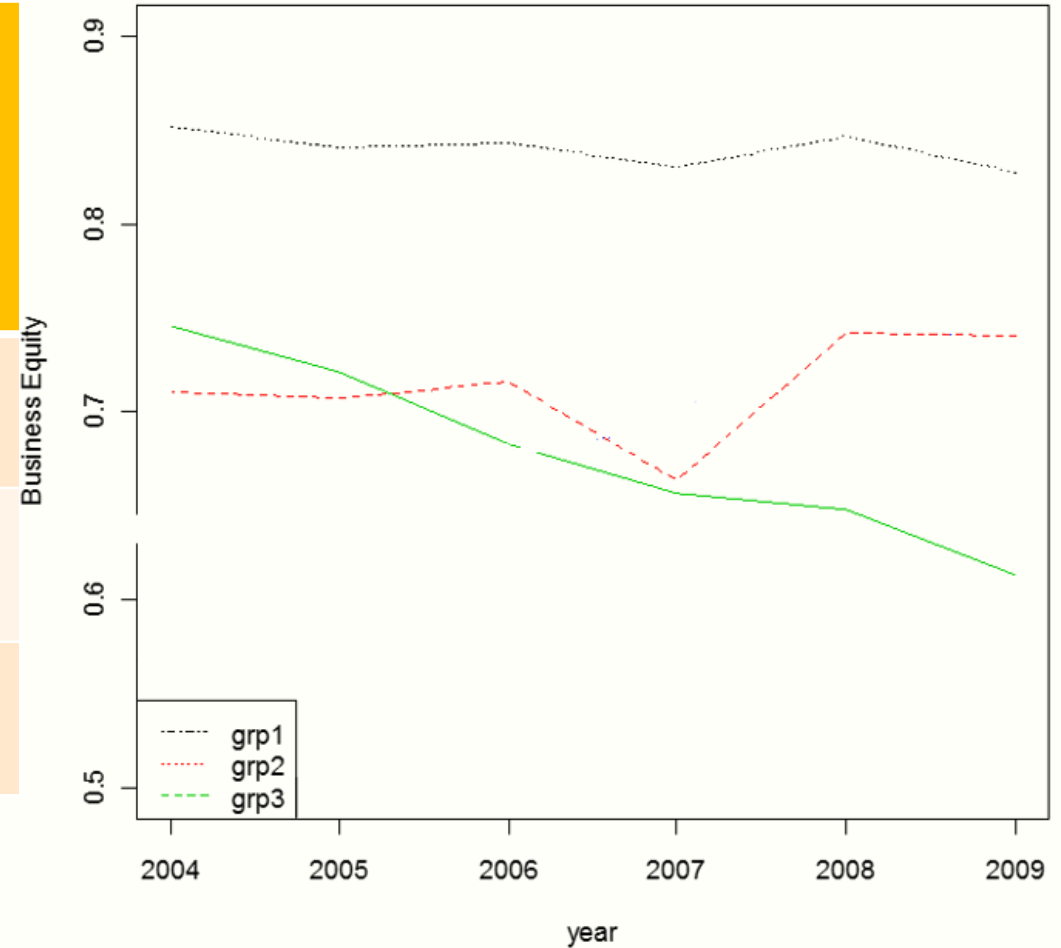
Past Drought Experience



- 70 - 85% Income from cropping – Wheat Dominance
- Average size 4800Ha
- Around 350mm annual rainfall, with between 250mm and 220mm falling during the winter growth period.
- In 2006 and 2007 GSR < 120mm

Business Financials (2001 – 2008)

	Number	Return on Capital (2008)	Change in Equity (2004 – 2008)
Group 1	76	2.7%	-2%
Group 2	49	12.9%	+5%
Group 3	14	0.1%	-14%



6 years of farm production data collected

Hectares owned	Fuel and oil	Plant R&M
Hectares managed	Total operating Income	Infrastructure R&M
Permanent labour	Wages	Depreciation
Casual labour	Contractor costs	Lease Costs
GSR (mm)	Fertiliser	Finance Costs
Hectares x crop type	Seed	Tax
Overall enterprise mix	Chemical	Equity
\$ Sales x crop type	Personal Drawings	Business assets
Sheep + Cattle Numbers/sales/purchases/ etc	Debt	Off farm assets

And more...

Economic Factors found to not be significant

- Farm size
- Differences in Rainfall between Farms

Significant factors

- Management

Existing Resources

GRDC - Dealing with dry - <https://grdc.com.au/resources-and-publications/resources/dealing-with-the-dry>

Challenging drought conditions

As grain growers across the GRDC's northern region and parts of the southern region continue to be challenged by drought conditions, the GRDC is committed to providing access to practical agronomic advice and support to assist with on-farm decision making during tough times.

This page provides easy access to useful information on agronomy in dry times and tips for planning and being prepared when it does rain.

There are also resources for farm business, including tips for retaining staff in dry times and debt management strategies, including advice on how to prepare for difficult conversations with your bank manager.

Watch the videos from the GRDC Dealing with the Dry forum series. These forums were initiated to bring practical, relevant information to growers in drought-affected regions of New South Wales and Queensland.



Resources

Agronomy for dry conditions	▲
Farm business strategies in tough seasons	▲
Mental health support	▲
Harvest or hay making informed decisions	▲
Government support what is available	▲

Agronomy for dry conditions ▼



Maximising crop potential in a drying environment

Changing weather patterns can mean growers are increasingly attempting to plant into less-than-favourable conditions. This resource offers information on how and what growers can do to make the most of varying moisture levels in a drying environment.

[Read more](#)



Are you ready and set for when it rains?

Experienced agronomist Greg Rummery offers growers a guide-for-action amidst the often paralysing talk of drought, rainfall deficits and erratic summer storms. Here is what growers can do to put themselves in the best position to take advantage of a sustained seasonal break

[Watch video](#)

Farm business strategies in tough seasons ▼



Business planning guide for farmers recovering from drought

This guide was commissioned by the GRDC to assist growers and advisers in making the complex decisions that will be necessary in planning and implementing strategies to manage seasonal threats and opportunities given the effects of past and on-going climatic and financial challenges

[Read more](#)

The GRDC have also developed a [video series](#) focused on delivering practical information and support to grain growers in drought affected regions during some of the toughest seasons on record.



Banking on good communication for drought recovery

Former rural banker and agronomist Garry Littlejohns offers some advice and practical tips for how to talk debt with your bank manager and what you can do to put yourself in the best possible position for that tough conversation.

[Read media release](#) | [Watch video](#)



Could benchmarking help growers survive the next dry?

Farm business consultant Simon Fritsch explains how understanding aspects of your business, like expenses, and how they compare with similar agricultural operations could help growers identify how and where they might be able to reduce costs.

[Read more](#) | [Watch video](#)



Job security stress: the flow on effect of no rain

Agronomist and grower Drew Penberthy discusses the importance of retaining staff when times are tough and explores the options as well as the value of involving your employees in key conversations

[Read more](#)

Take Home Messages

- Dealing with drought is as more about how you plan prior to and respond following than it is during.
- Ground cover (stubble) is KING!
- Making timely decisions will put you in the best position to produce yield and generate cashflow