



RED MEAT UPDATES

TASMANIA

27 July 2018

Optimising energy use to increase pasture production

Iain Bruce



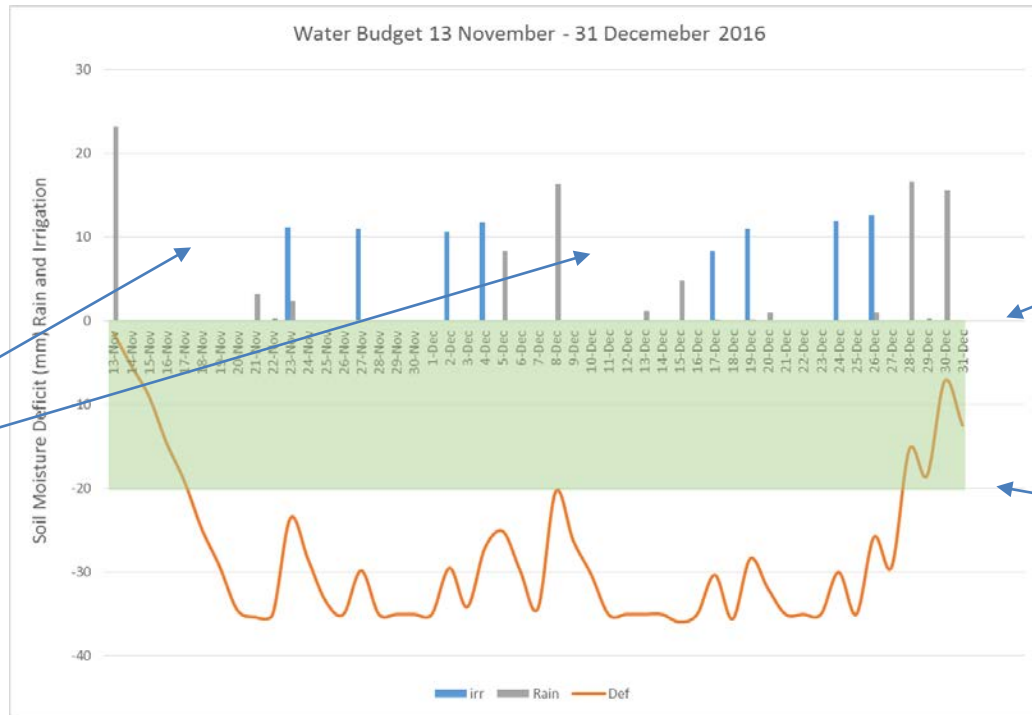
Agronomic overview

- Power price agreement set?
 - Focus on the production outcomes.
- Why: Control costs by increasing production
 - Local examples
- How: Measure, monitor and visualise
 - Identify the variables
- Off-peak vs shoulder
 - Can using cheaper power cost you money?

The green drought

Average ETc = 4.3mm/d - therefore required 200mm rainfall plus irrigation to replace water used. Rainfall plus irrigation was 191mm – so similar to requirements, but the timing was wrong

Delayed start up of irrigation after rain led to a soil moisture deficit dropping below the refill point. Scheduling of irrigation events was not adequate to correct this deficit leading to the green drought phenomena



Field capacity

Readily available water
The aim is to keep the deficit in this region for optimum pasture production

Refill point



Source: Dr James Hills, TIA
National Smarter Irrigation for Profit Project
Dairy Aust, TIA, Federal Government



Why — lost production

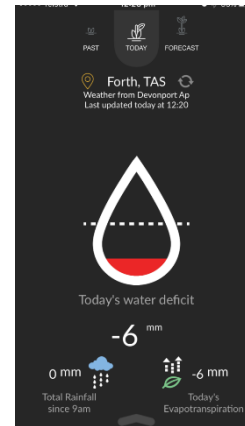
60 days x 30 kgDM/d x 40 ha
= 72,000kg of DM foregone

72,000kg @ \$200/t
= \$14,400 or \$360/ha

How — theory

- You need to know:

1. Evapotranspiration rate
2. Soil water holding capacity
3. Soil water level at a point in time (RAW)
4. Irrigation system capacity



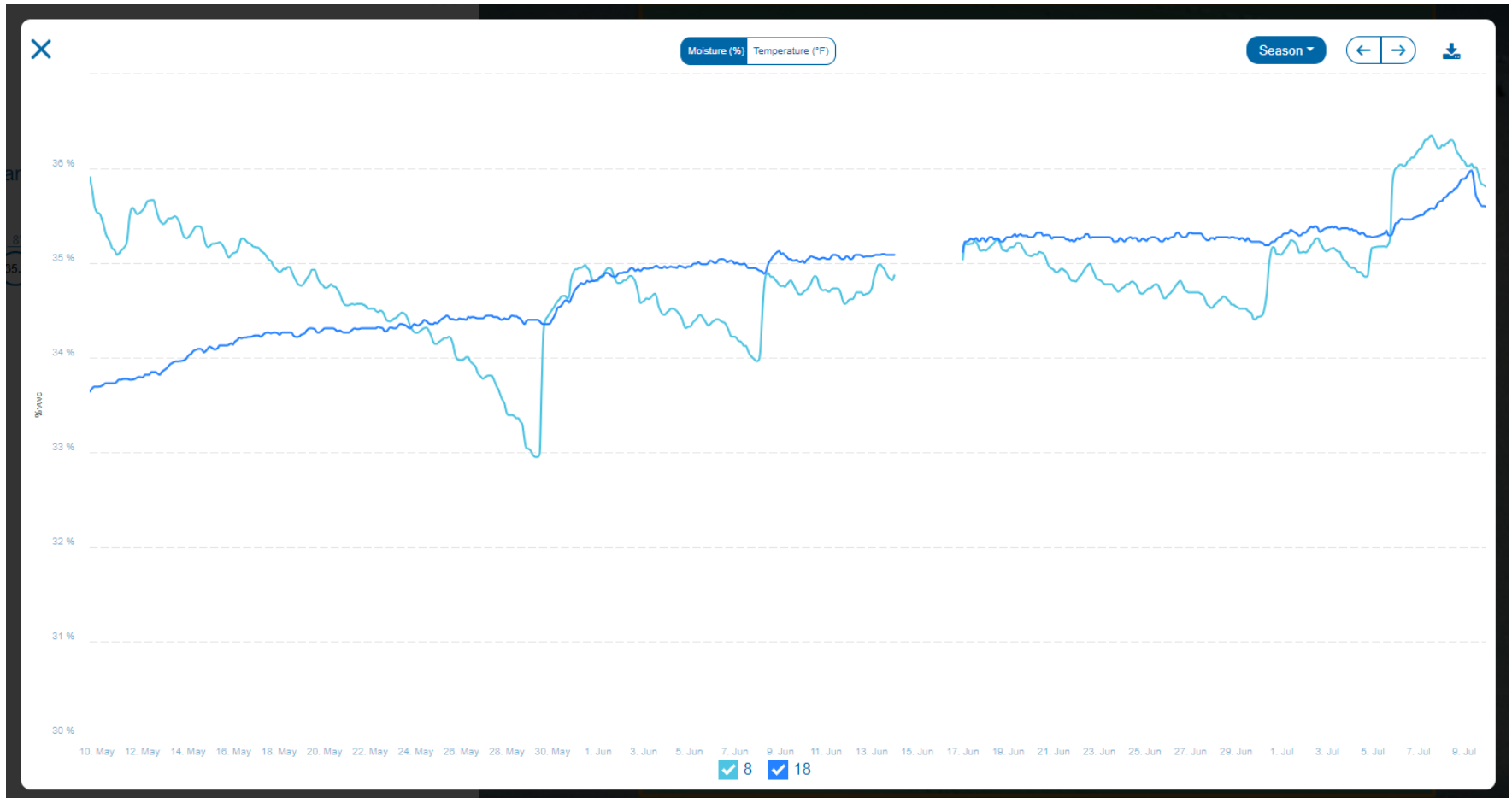
Soil water bank

- Soil only holds so much water → soil type.
- Water in soil is money in the bank.
- Capacity of this bank **determines** the maximum application/input amount.
- Irrigation is **putting** money into bank.
- Evapotranspiration is **taking** money out.
- It is important to always know your **current bank balance!**

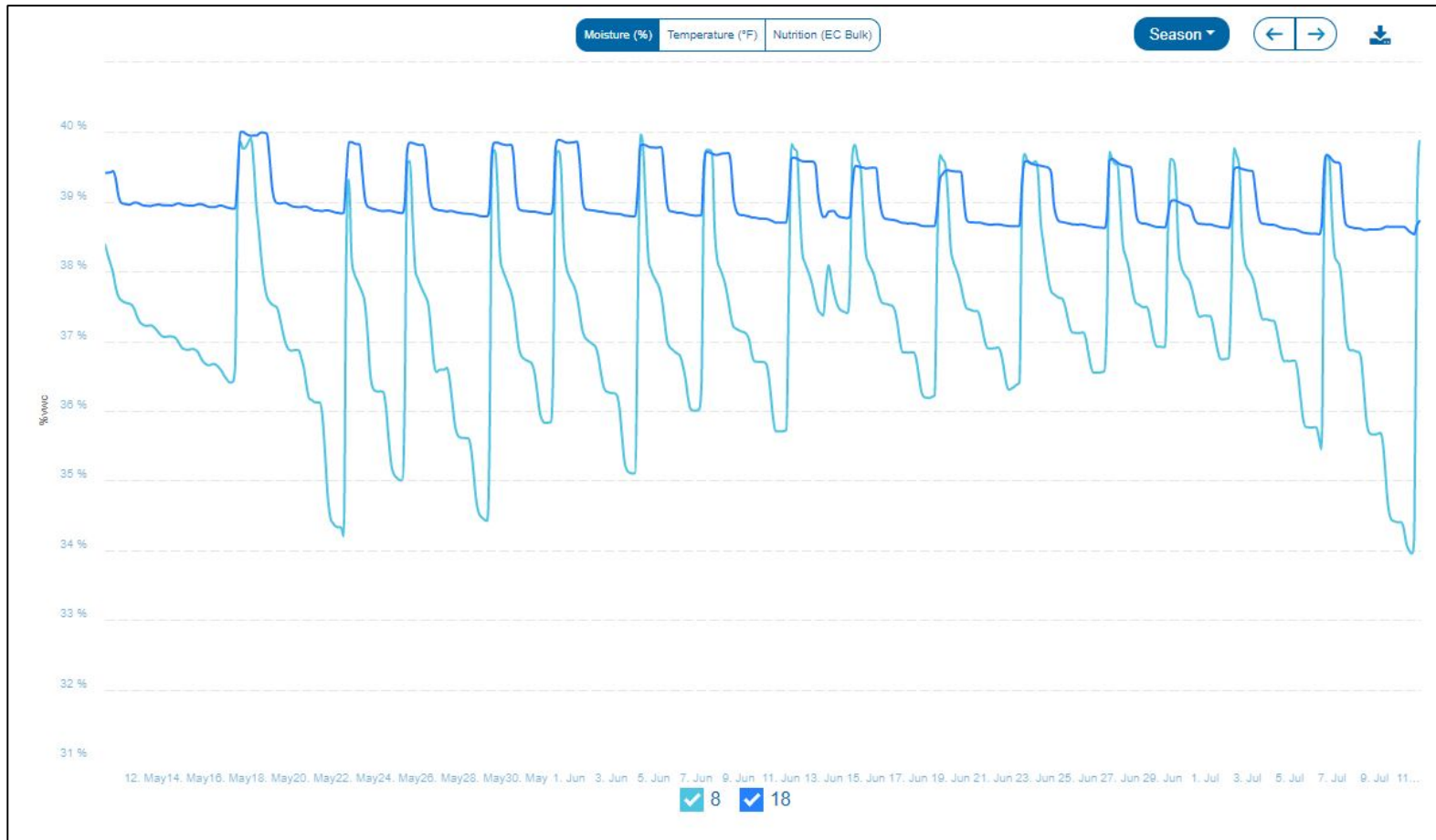
How — practice



Current water in soil

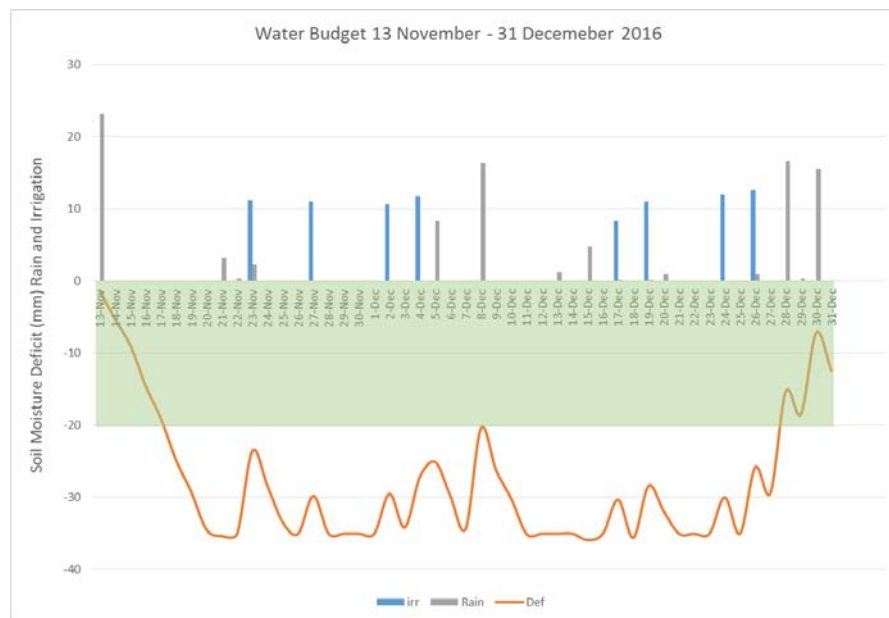


Current water in soil



Off-peak vs shoulder

- $60\text{d} \times 30\text{kgDM/d} \times 40\text{ha} = 72,000\text{kg}$ of DM lost
- 8mm/day pack
- 30mm per week req
= 4.25mm/day



Off-peak vs Shoulder

Power costs

Irrigation – time of use Tariff 75

	Inc. GST	Ex. GST
Daily supply charges	279.809 ¢/ day	254.37 ¢/ day
Peak energy	30.409 ¢/ kWh	27.645 ¢/ kWh
Shoulder energy	22.144 ¢/ kWh	20.131 ¢/ kWh
Off-peak energy	13.837 ¢/ kWh	12.579 ¢/ kWh

Source: James Curran, Macquarie Franklin

Off-peak vs shoulder

	Off-peak	Shoulder
Mon-Fri	9hrs = 3mm	13.3hrs = 4.4mm
Sat-Sun	24hrs = 8mm	13.3hrs = 4.4mm
Total applied	31mm	31mm
Total hours	93	93 (21 shoulder)
\$/hour	\$4	\$4.52
Weekly cost	\$372	\$420

Weekly difference \$48 = \$1.20/ha/week

Off-peak vs shoulder

- 60-day shoulder irrigation extra cost
 - = \$10.30/ha
 - = \$412

- 60 days x 30kgDM/d x 40ha
 - = 72,000kg of DM foregone
 - = \$14,400 or \$360/ha

Top three take home messages

1. Know your soil water bank balance, input requirement and your capacity.
2. Live information is key.
3. Power cost \ll lost production cost.

Tools, resources and training

1. System capacity
2. Soil capacity
3. Usage rate
4. Live data



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