

Rural Research and
Development for Profit
Keeping Australian farmers
at the cutting edge



Australian Government
Cotton Research and
Development Corporation



Australian Government
Department of Agriculture
and Water Resources



SMART Automated Irrigation 2a

Adaptive Precision Irrigation Systems for Broadacre Agriculture

Dr Joseph Foley, Dr Malcolm Gillies, Dr Alison McCarthy, Dr
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Sugar Research
Australia™



Dairy
Australia

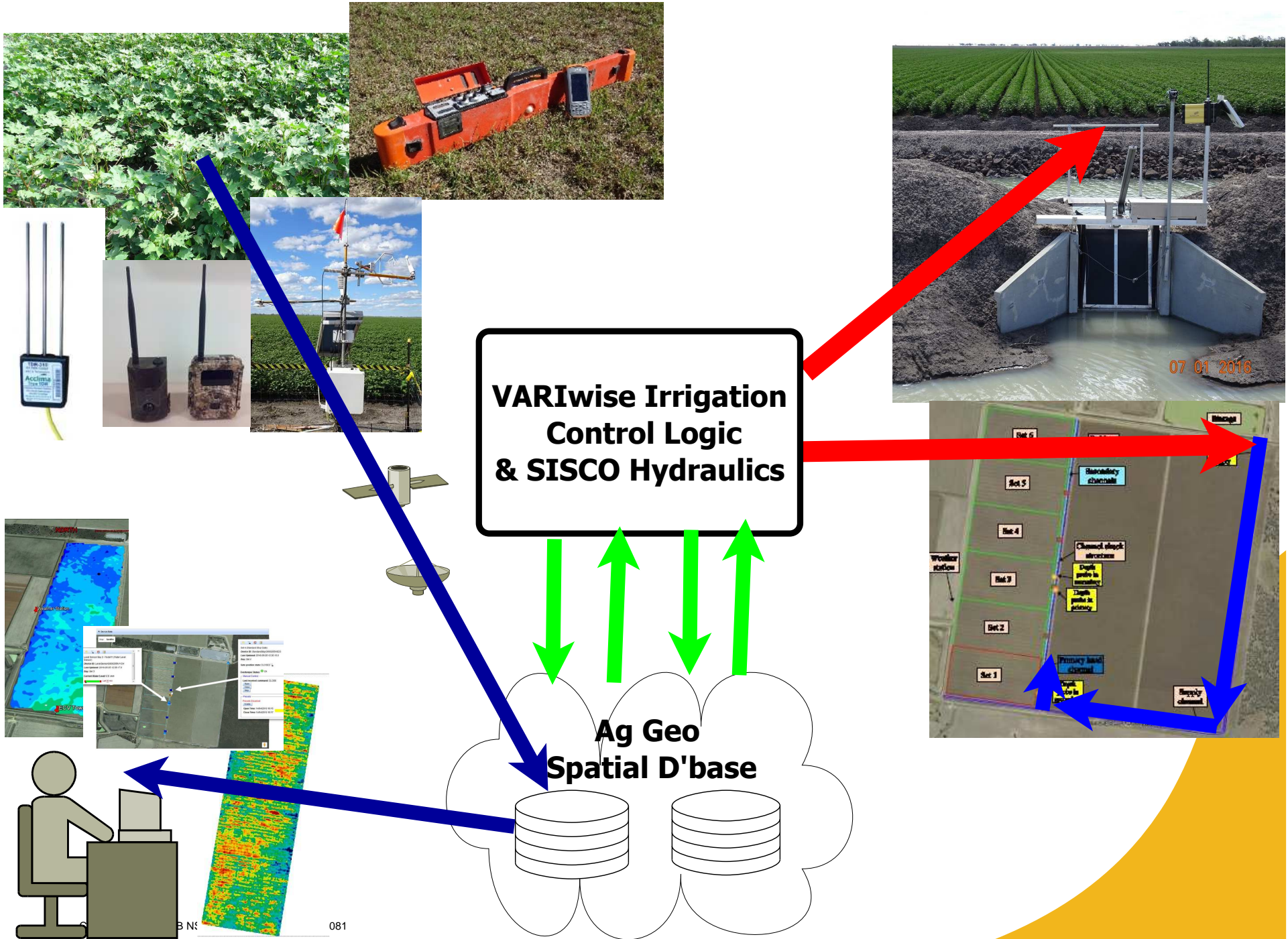
Adaptive Precision Irrigation for Broadacre Agriculture



Four separate field sites:

1. Furrow irrigation in sugarcane near Ayr in the Burdekin, FNQ
2. Furrow irrigation in cotton near Wee Waa, NSW
3. Lateral Move in cotton near Dalby, QLD
4. Centre Pivot on dairy pasture in north western Tasmania

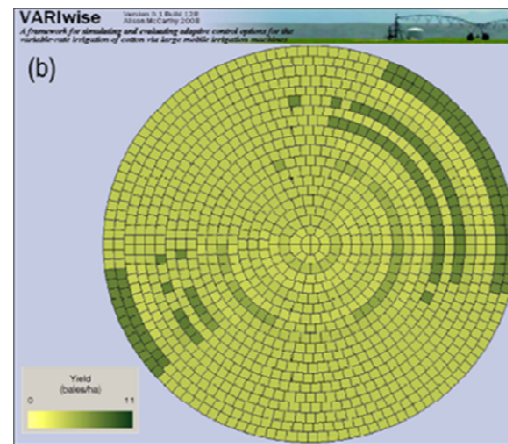
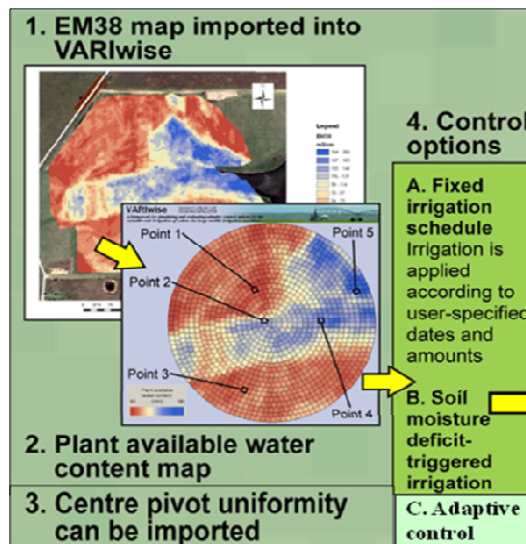




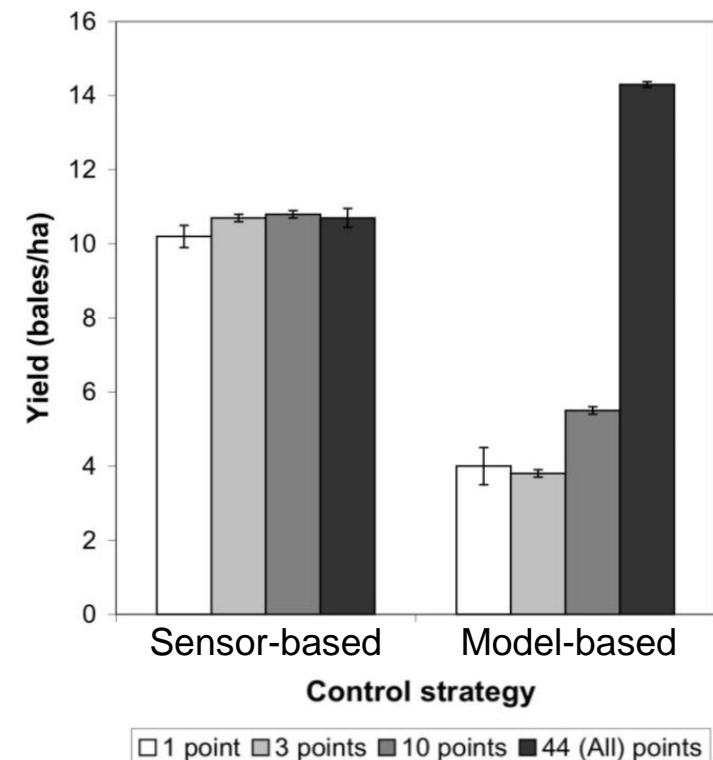
Previous work and current project



- Evaluation of 'VARlwise' irrigation control strategies
- Camera-based cotton growth and fruiting sensors
- This project will demonstrate system with commercial VRI and extend to dairy pasture and sugarcane



Sensor location	Variability in machine uniformity	Yield (bales/ha)	Irrigation water use efficiency (bales/ML)
Point 1	Low	7.0	0.7
	High	7.0	1.0
Point 2	Low	7.1	0.7
	High	7.0	1.0
Point 3	Low	7.1	0.8
	High	4.6	0.4
Point 4	Low	6.8	0.7
	High	7.0	1.0
Point 5	Low	7.4	0.9
	High	7.0	0.9

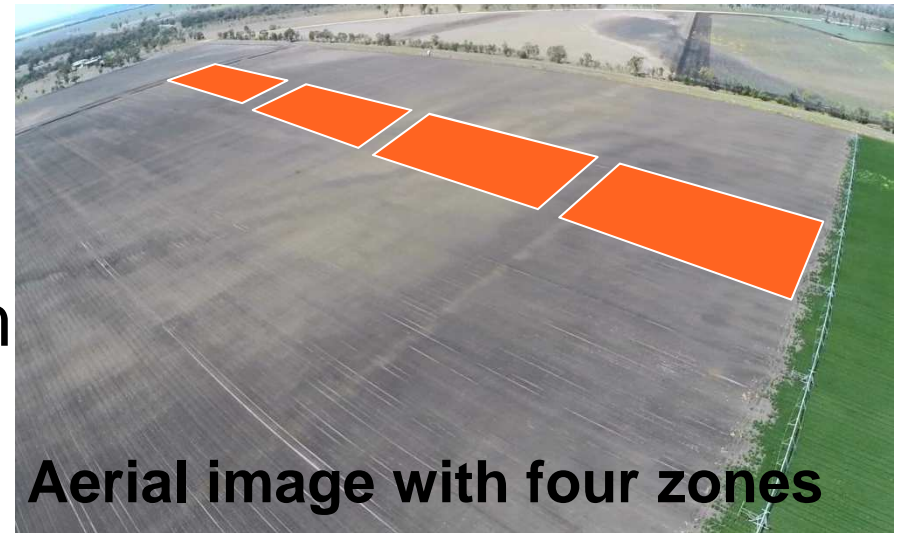


Site-specific cotton irrigation

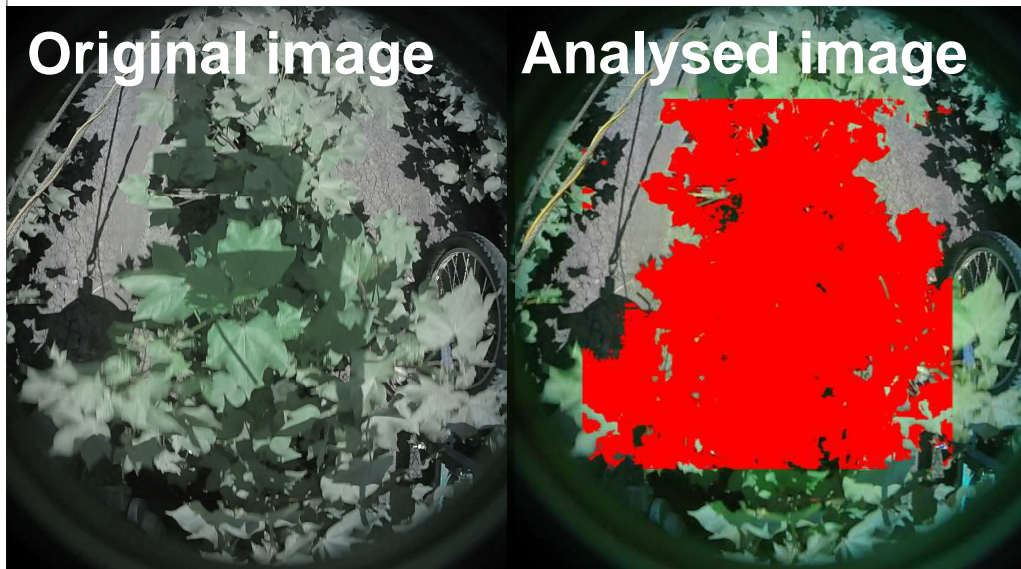


NCEA
National Centre for
Engineering in Agriculture

- Trial in Dalby to demonstrate variable-rate irrigation and sensors in control system
- Three irrigation treatments in each zone



Aerial image with four zones



Span with three cameras

Automated irrigation for dairy pastures



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National Centre for
Engineering in Agriculture

Location of cameras on pivot

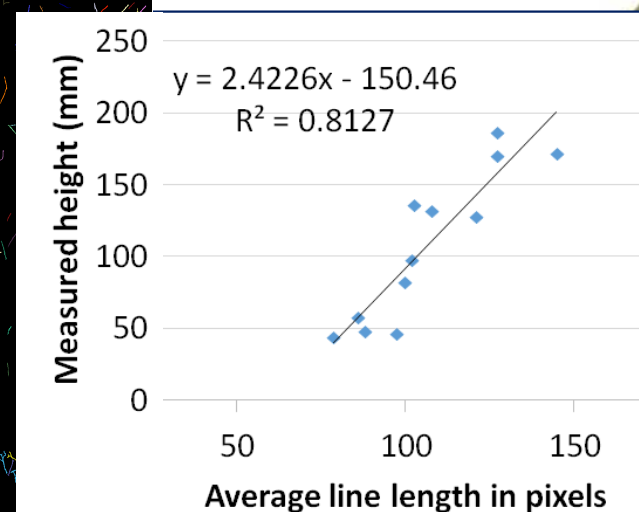
- Pasture height used for grazing, irrigation - image analysis for leaf length
- Compared with weekly quadbike height data



Original image



Analysed image



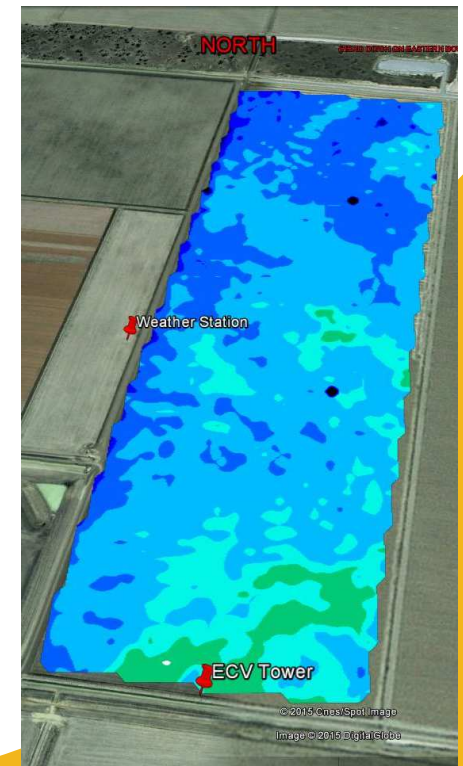
Automation of furrows in cotton with Small Pipe Through Bank



SPTB, blind head-ditches, Padman gates, Rubicon zigbee & mobile based control systems near Wee Waa.

Six sets of 18 ha each for total of 108 ha – automated.

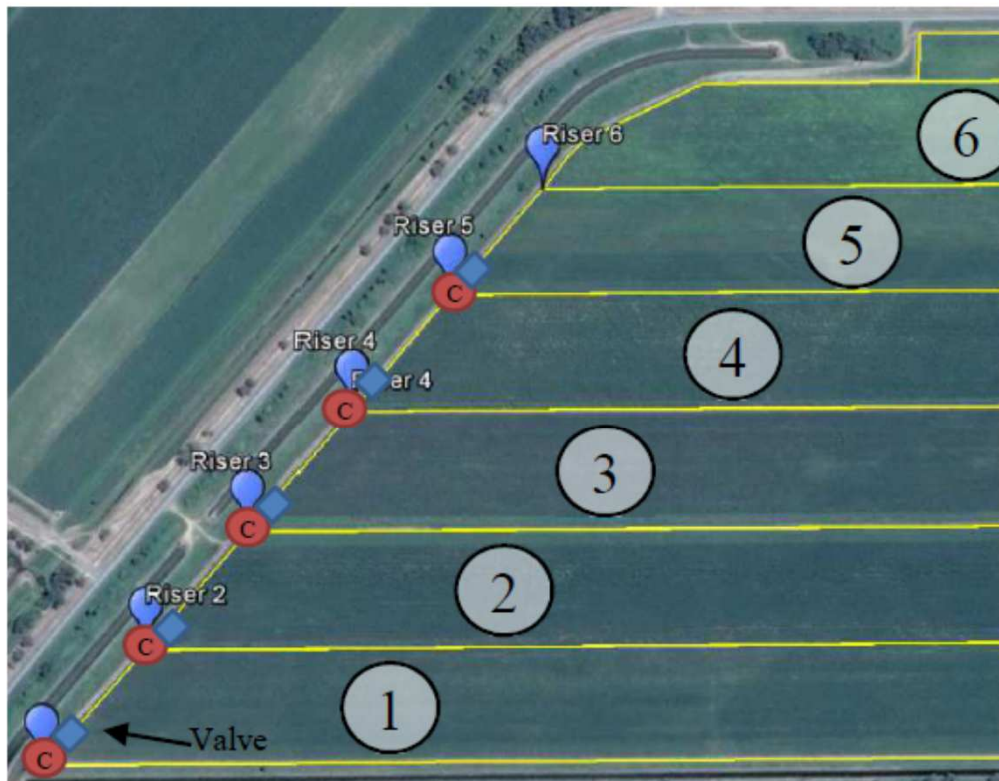
AWS, ECV, EM38, depths, flows, SM w/ TDR & FDR



Automation of furrows in sugarcane from gravity channel



Actuated valves into fluming, w/ advance, met., SM, flow, depth sensing.
Control on PC, phone, tablet



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