

Australian

CliMate



SoilWaterApp, Irrigation and the new CliMate App

or

Knowing current conditions and probabilities

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National
Landcare
Programme



Overview

- Decision framework for risk management
- What info lies in our climate records – the farmers bookmaker or almanac
- Update on CliMate – Trend, Potential yield
- Explore some examples from the floor – Howoften?
- SoilWaterApp + irrigation
- Explore some examples

www.climateapp.net.au

(www v2, iOS v1, Android coming)

www.soilwaterapp.net.au

(iOS only)



If You Can't Measure It, You Can't Manage It

However, There are many things that cannot be measured and still must be managed.

And there are many things that cannot be measured and managers must still make decisions about.

The water managers challenge

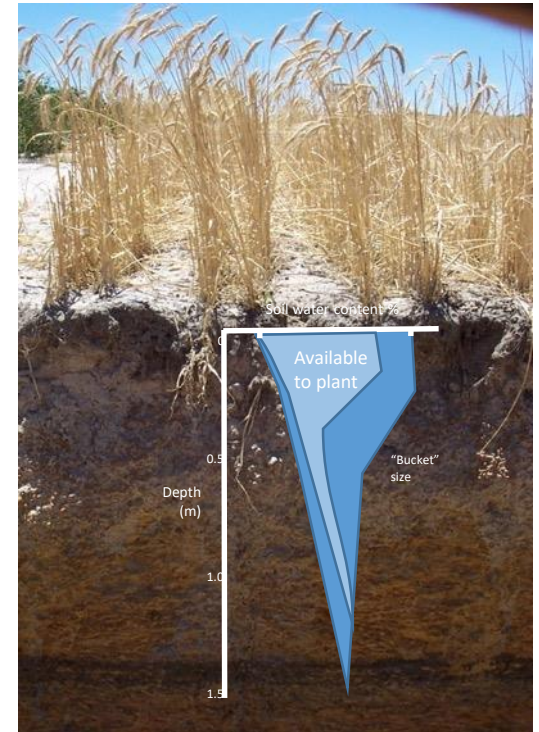
- Unreliable and erratic rainfall >> crops are highly dependent on soil water.
- Fast and reliable estimates of soil water could be useful

Leads us to ...

- How best to estimate soil water?

and

- How best to estimate the odds of future rain



Good decision making uses understanding of ...

current status + probability of future events



What is the value of knowing these?

“all decisions are based on forecasts”

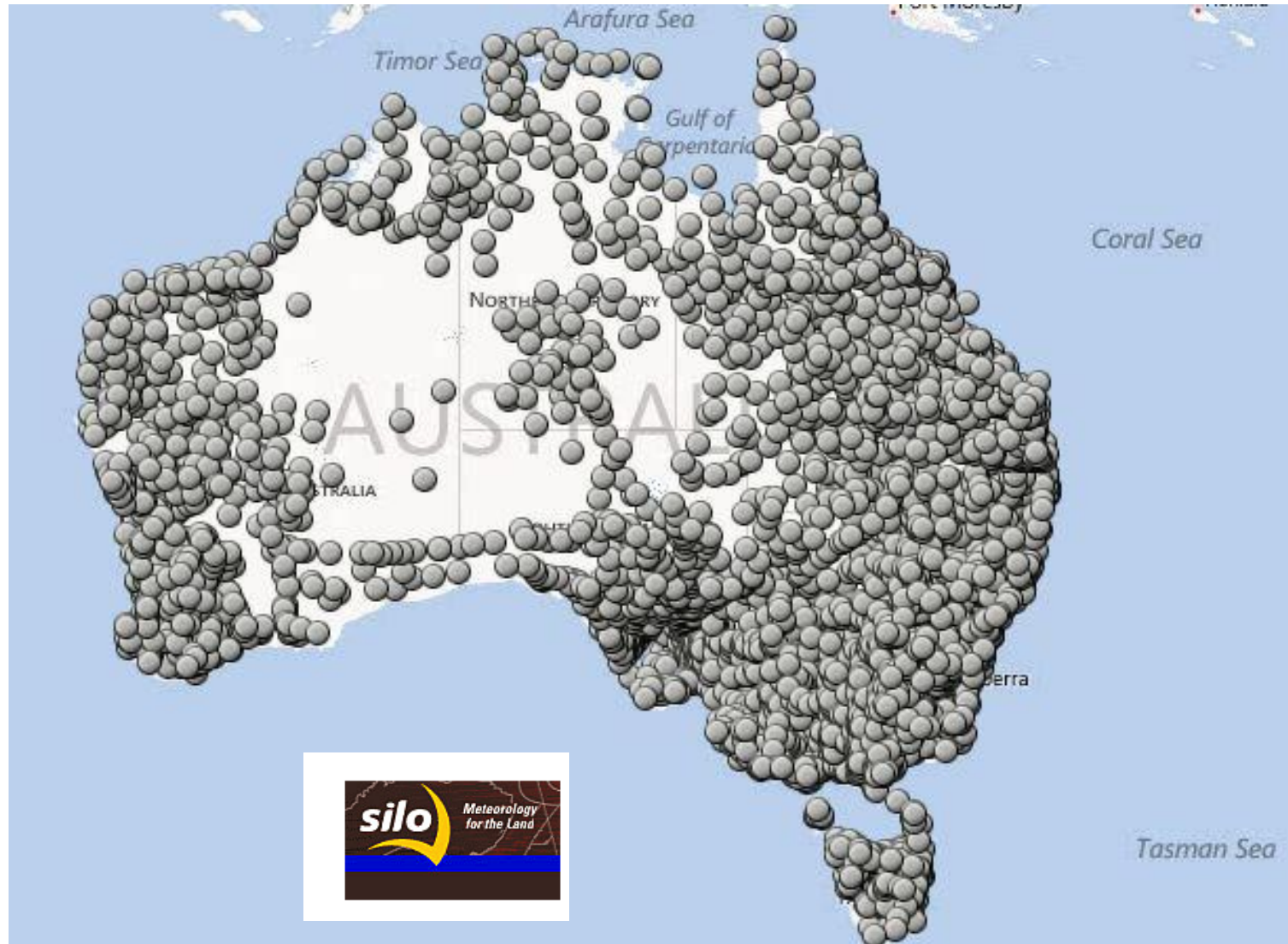
“most of us are not good at probabilities”

Dan Gardener, U Pennsylvania

*from Best Practice Podcast with Richard Aidy
20th May 2016 ABC RN*

The bookmakers “odds” machine

(>8,000 sites with >100 year record)



How's the Season?

Rain, temperature, radiation & heat-sum

Track how the current season is progressing, as compared to past seasons.

Run Analysis...



How often?

Rainfall, temperature, radiation, heat sum, risk assessment

Explore probabilities of future rainfall and temperature events based on past seasons.

Run Analysis...



How Wet/Nitrate?

Soil water & nitrate

Assess how soil water and nitrate have changed over the current fallow season.

Run Analysis...



Yield Potential?

crop yield

Yield potential based on water supply (soil water + in_crop rain) and water use efficiency.

Run Analysis...



Drought?

Drought, percentiles, rainfall deficit, residence period

Drought? provides a monthly update of drought status using the Drought Percentile Method.

Run Analysis...



How Hot/Cold?

Cold & heat stress

Assess the chance of heat-stress and cold-stress events for any day of the year.

Run Analysis...

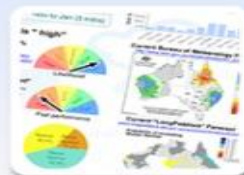


How Likely?

Rainfall & temperature seasonal forecast

Generate seasonal climate outlooks and assess historical forecast skill.

Run Analysis...



How's El Nino?

Atmosphere & ocean status

Assess current ENSO indicators based on key atmospheric and oceanic indicators.

Run Analysis...

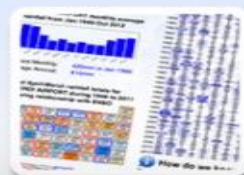


How's the Past?

Rain, temperature & radiation

Review historical monthly and annual rainfall, temperature and solar radiation patterns.

Run Analysis...



What Trend?

rainfall, temperature, solar radiation

Test whether trends in meteorological data and occurrences of particular meteorological patterns occur during different periods in recent history.

Run Analysis...



Potential Yield?

Q How is yield potential progressing?

for a crop planted 20 Oct 2016

which matures 160 days after planting

with starting SW of 100mm

a WUE of 2 kg/ha/mm

a threshold of 0mm

at NARRABRI AIRPORT AWS

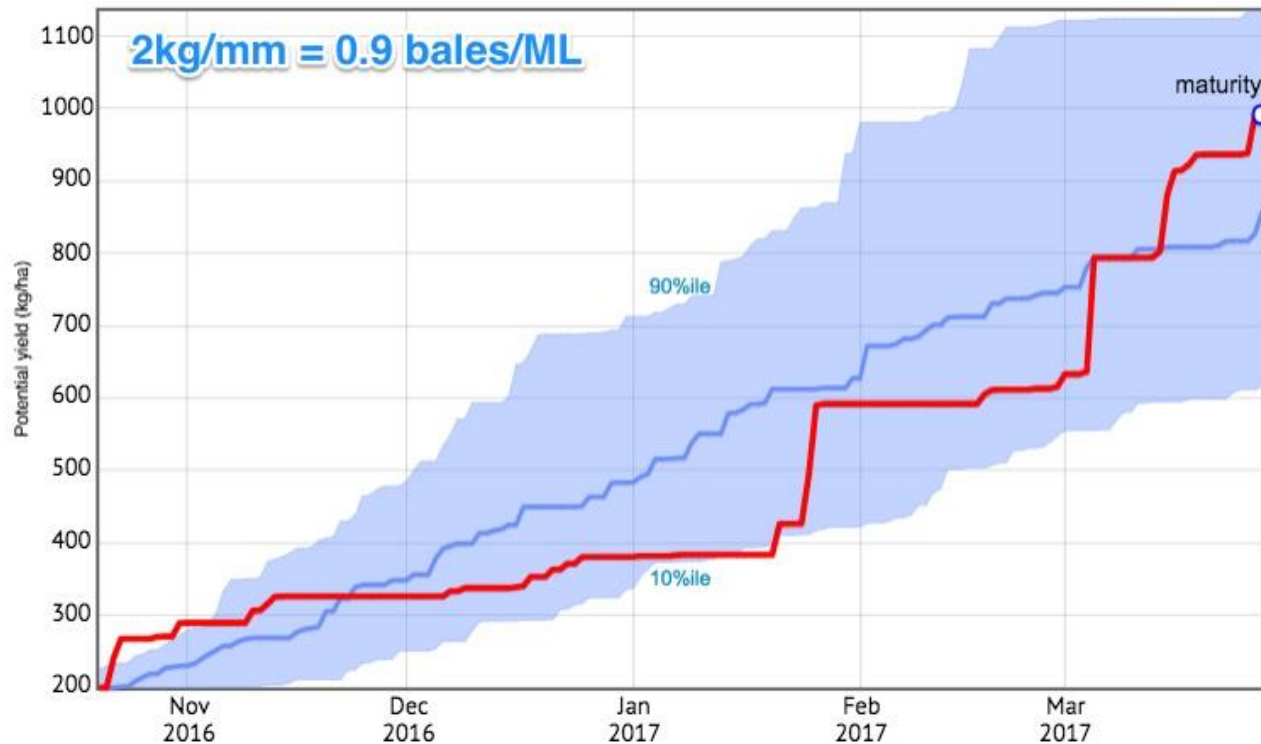
based on data from 1980 to present

A Expected yield as at 30/08/2017 is 859 kg/ha (81%-ile)



Expected water supply is 429mm
(soil water + incrop_rain)

Yield progress for crop planted 20/10/2016, mature 29/03/2017, WUE 2kg/ha/mm



What Trend?

Q Explore trends in...

in **Total Rainfall**

at **GOONDIWINDI AIRPORT**

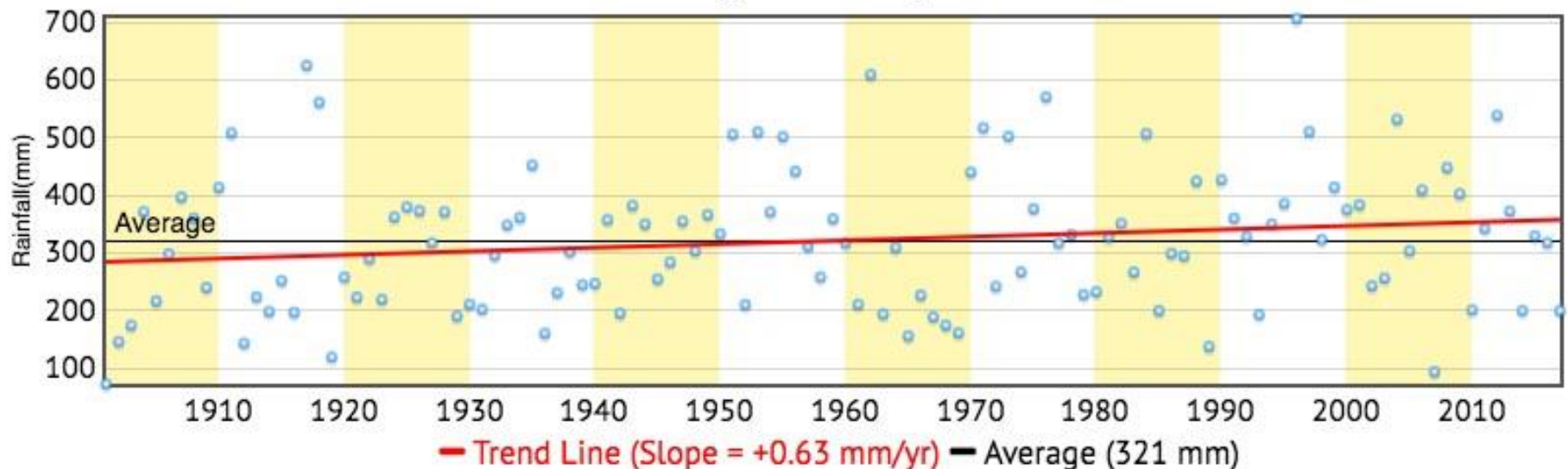
from **1900 to present**

during **October to February (5mths)**

A Visual Trend Analysis - see graphs below

October to February Results

Rainfall October to February, 1901-2017, GOONDIWINDI AIRPORT



What Trend?

Q Explore trends in...

in

at

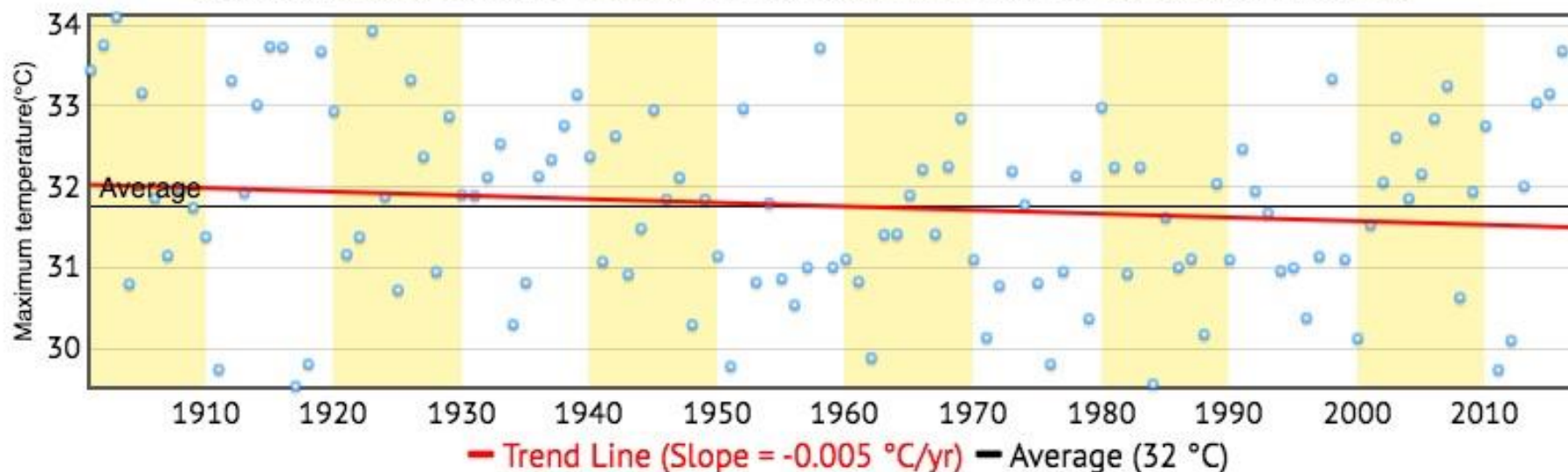
from

during

A Visual Trend Analysis - see graphs below

October to March Results

Maximum temperature October to March, 1901-2017, GOONDIWINDI AIRPORT



How often?

Q How often do we receive...

Rainfall more than 65mm

over a 10 day period

at GOONDIWINDI AIRPORT

between 12 September

and 30 October

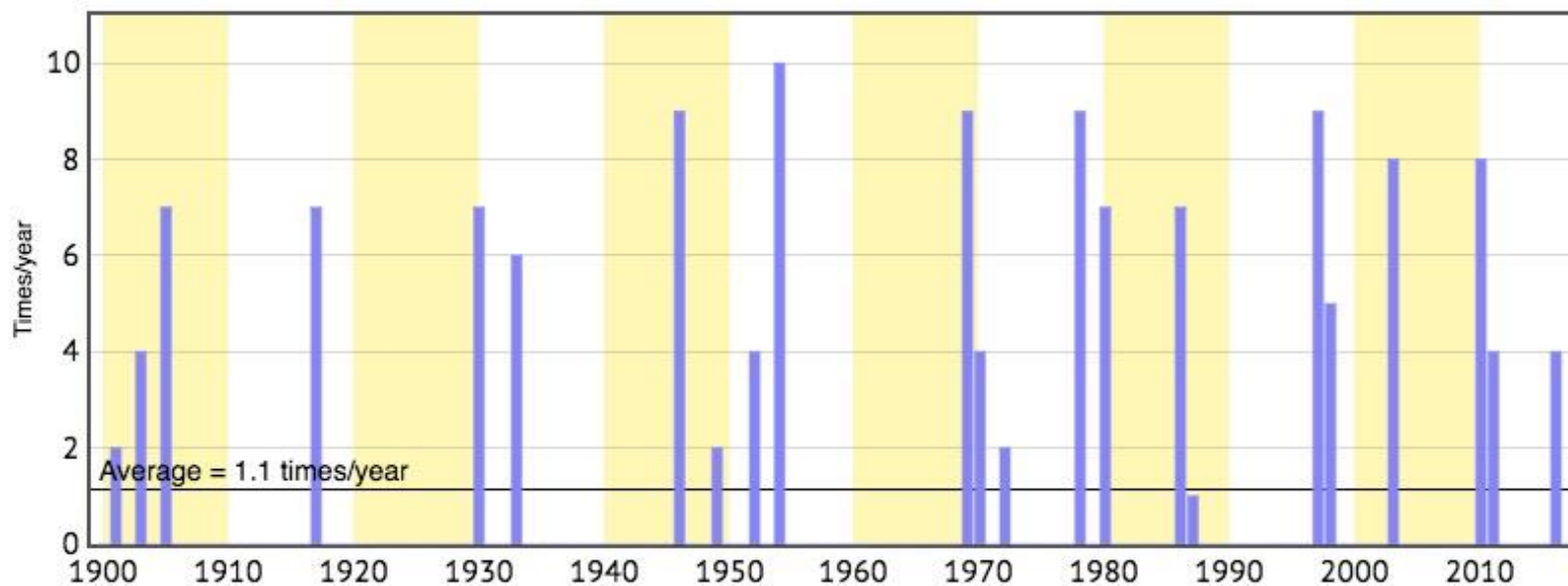
based on data from 1900 to present

A In 19% of years.



23 of 118 years,
1.1 times/yr

Times > 65mm Rainfall occurs over 10 Consecutive Days, 12 Sep-30 Oct (49 days)
GOONDIWINDI AIRPORT



Australian

CliMate

WWW www.climateapp.net.au (v2) (all devices)



(v1)



(v2) later 2017

Android

later 2017

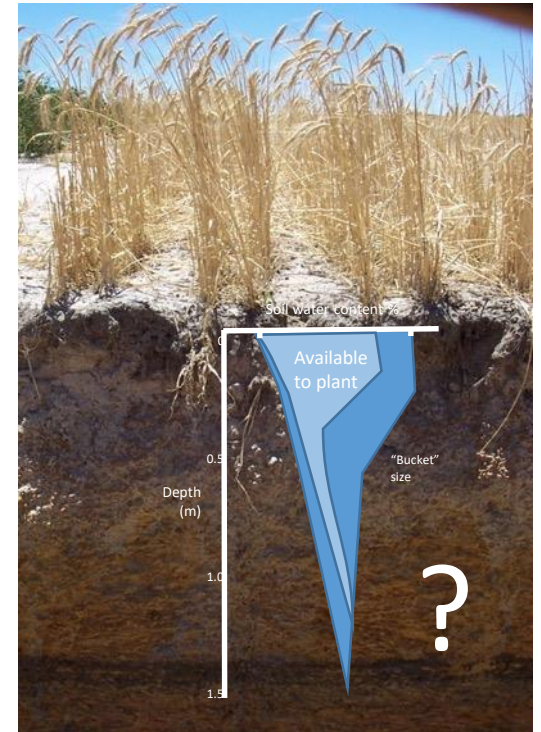
[See www.climateapp.net.au](http://www.climateapp.net.au) for updates

The water managers challenge

- Unreliable rainfall >> crops are highly dependent on stored soil water
- Fast and reliable estimates of soil water could be useful

Leads us to ...

- How best to estimate soil water?



SOIL MOISTURE ASSESSMENT



Sometimes its just bleeding obvious!

These estimates are good starting points for us

But what lies below?



Weather & soil sensors



1



2



4



3



5



6

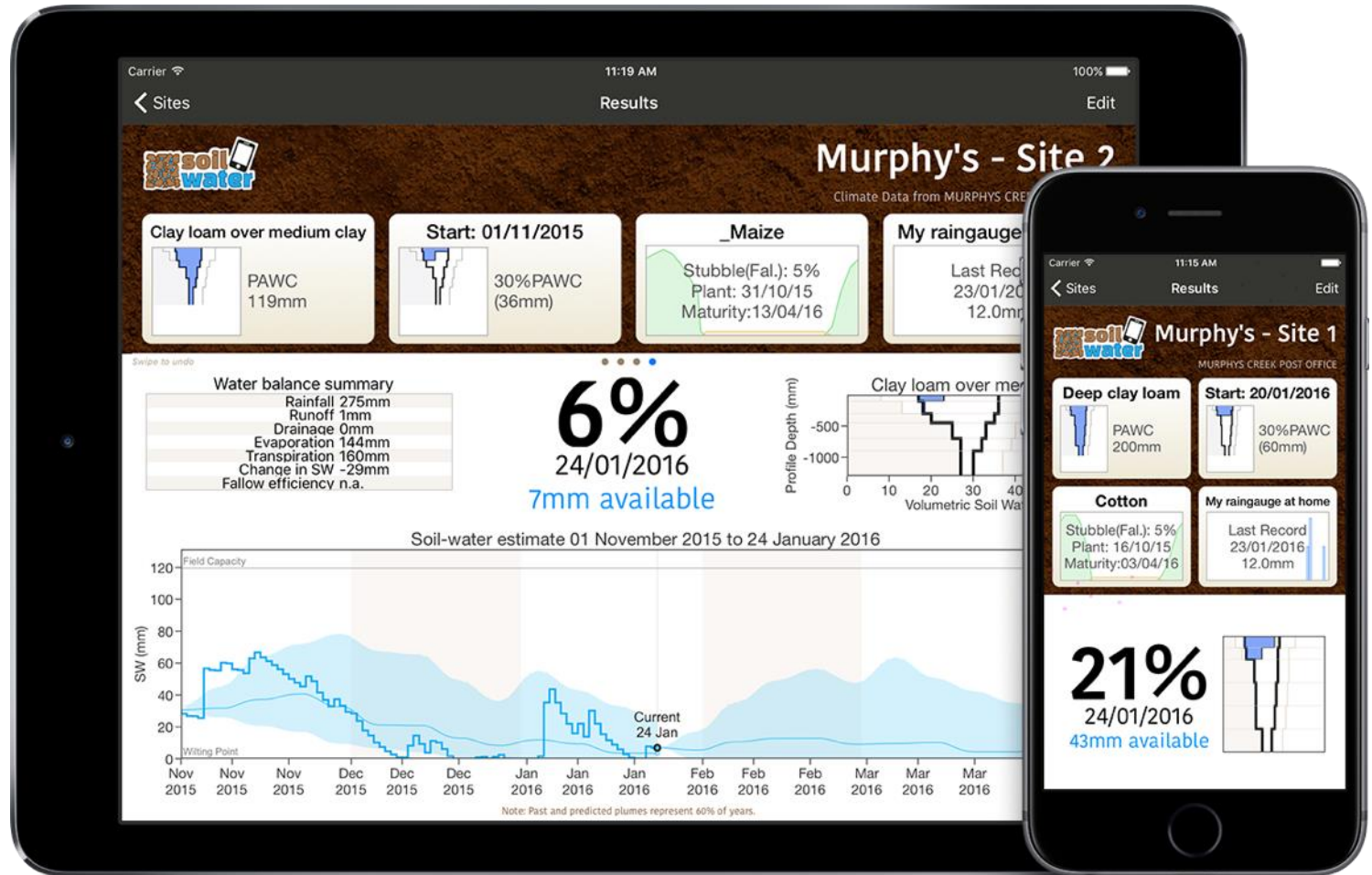


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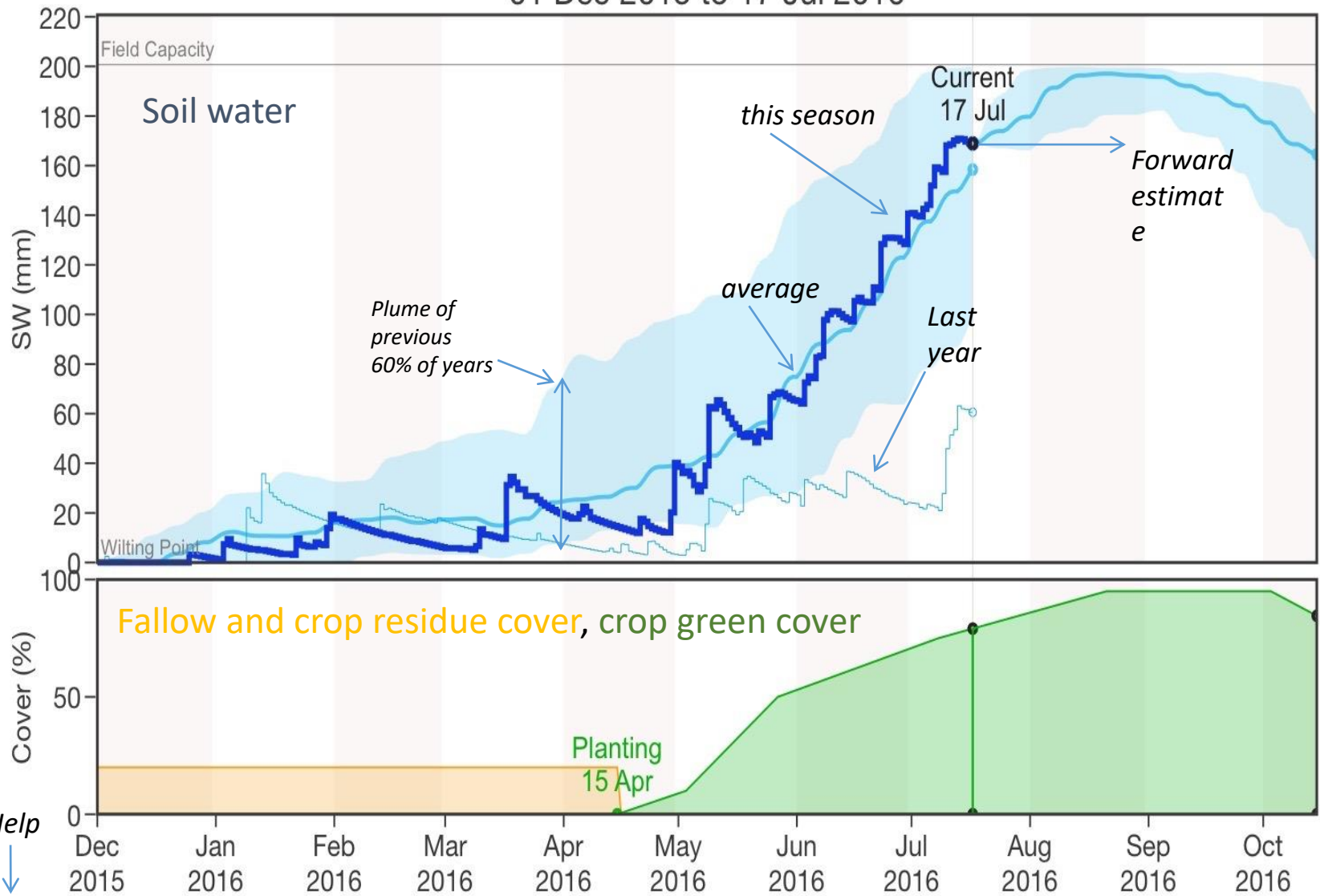
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SoilWaterApp



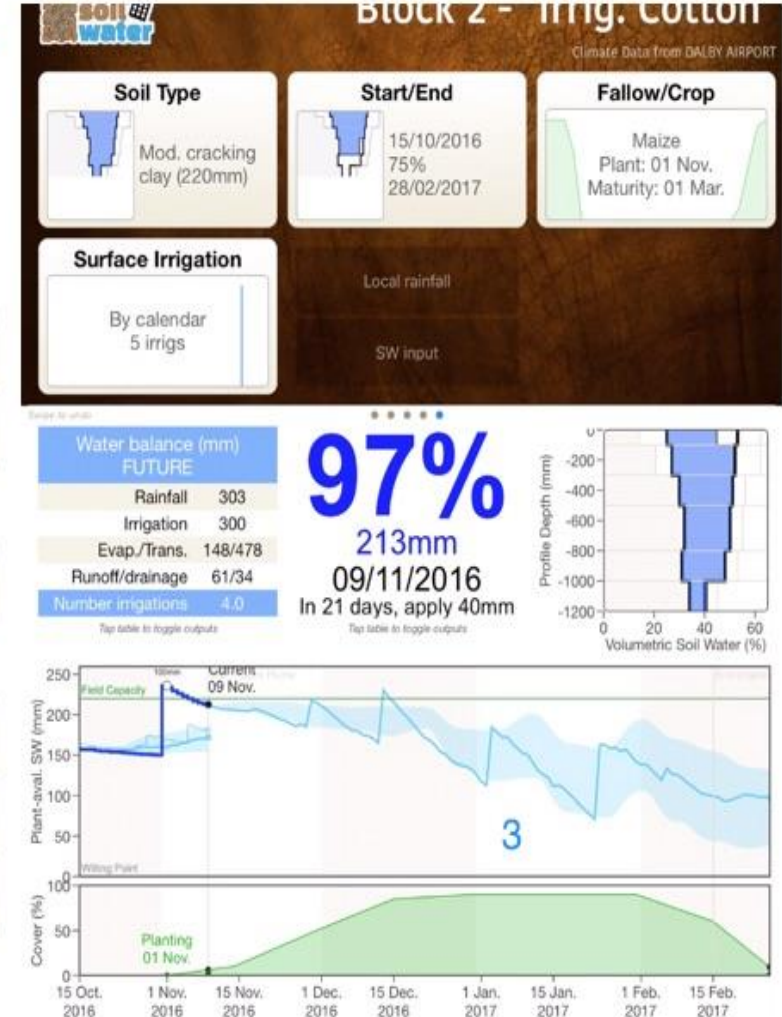
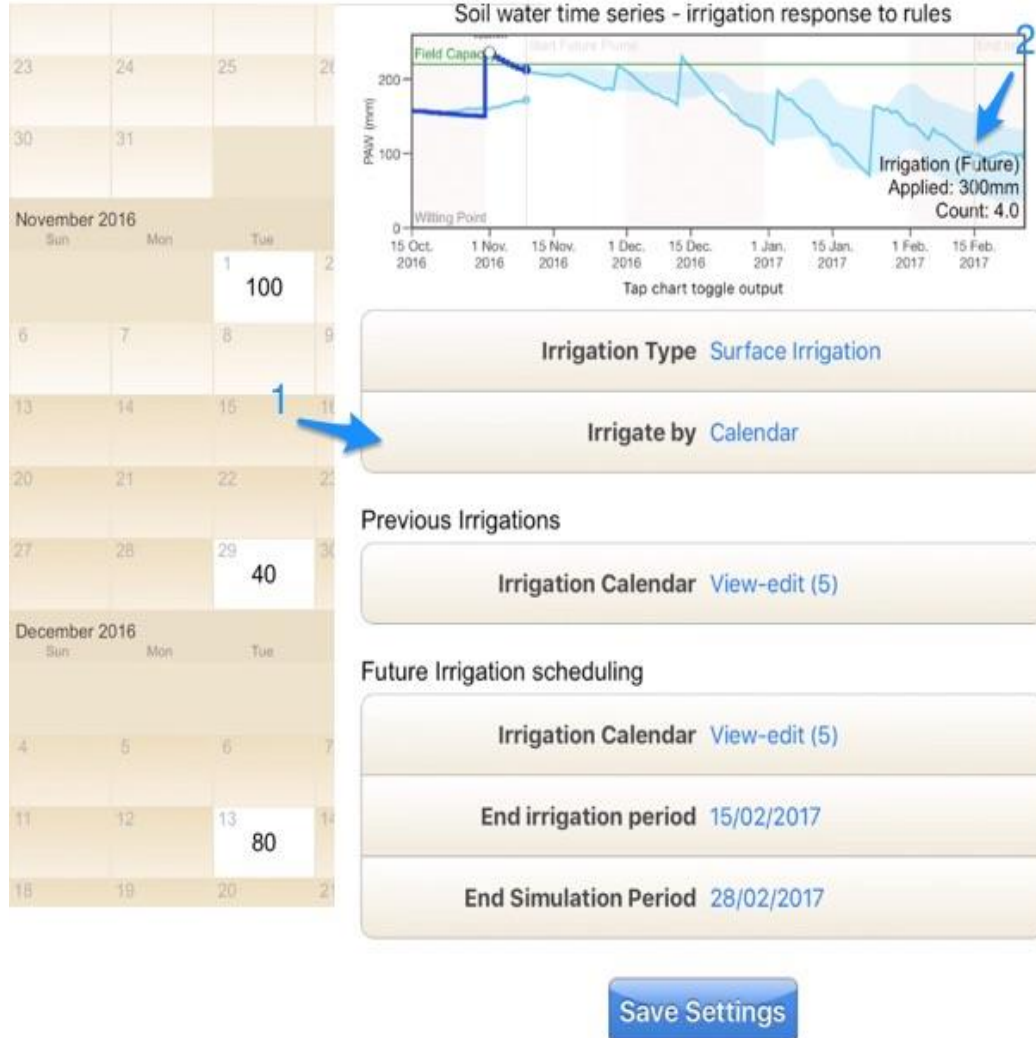
www.soilwaterapp.net.au

01 Dec 2015 to 17 Jul 2016

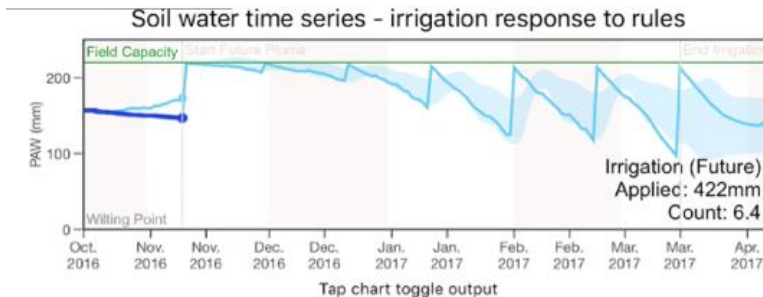


Note: Past and predicted plumes represent 60% of years.

Irrigation -by calendar



Surface irrigation, 21-day cycle, fill to field capacity



Irrigation Type **Surface Irrigation**

Irrigate by **Time interval**

Previous Irrigations

Irrigation Calendar **View-edit (0)**

Future Irrigation scheduling

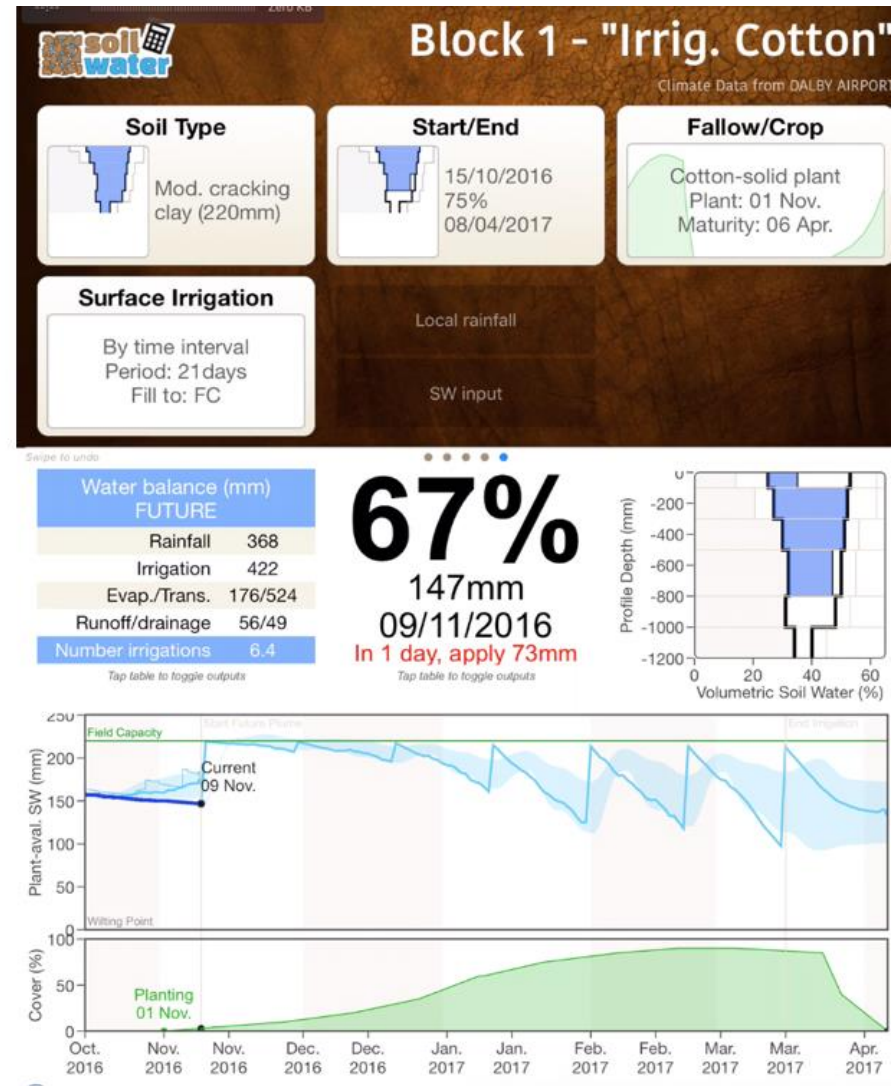
Irrigation frequency **21 days**

Fill-point **Field capacity (220mm)**

End irrigation period **15/03/2017**

End Simulation Period **08/04/2017**

Save Settings

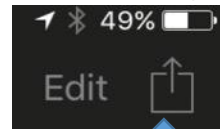


Resources

Help



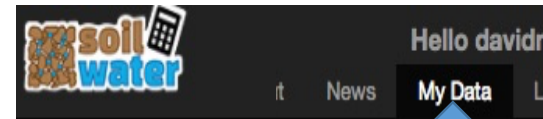
Share, report



Share report via email

Share site with others

My data



Library

SoilWater App Reference Library

Here you will find a range of documents, presentations and videos relating to the SoilWater App.

Show All Show Documents Show Presentations Show Videos Show Other



Rainfall data options

BoM

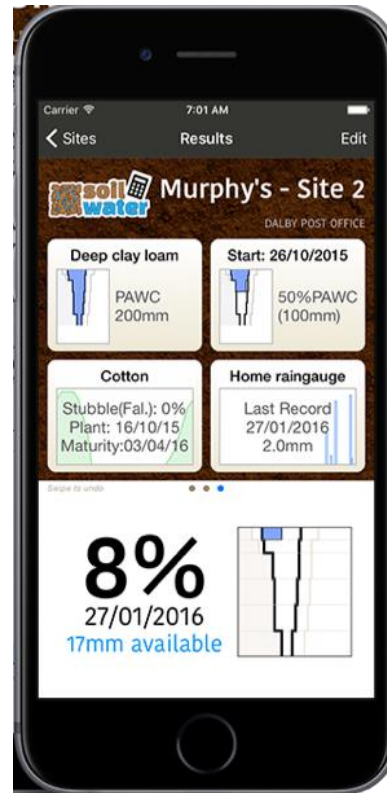


Local gauge



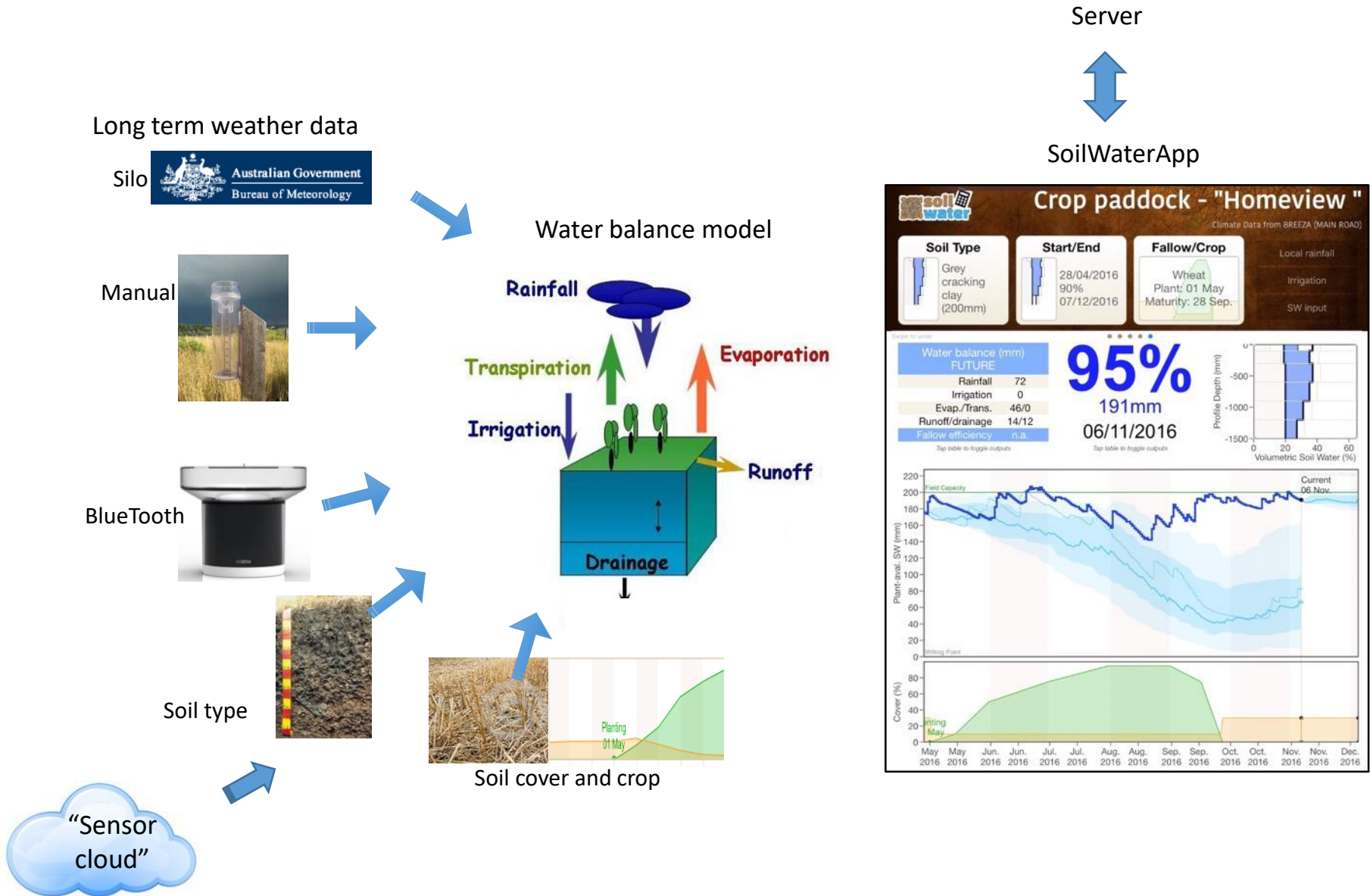
BlueTooth

“Sensor cloud”



Added data is stored in the cloud

SWApp information flow



Coming soon ..hopefully



Manual



BlueTooth



SoilWaterApp



App B, C



Other sensor networks

In summary

- App brings information together, customised for your conditions
- Available all the time
- Simple, fast and objective

CliMate



(v1)

www.australianclimate.net.au (v2)

Android coming late 2017

SoilWaterApp



Acknowledgements

*These Apps were developed with cooperation from
scientists and growers*

Funded by MCVP and GRDC

Future developments funded by the Commonwealth Government's NLP program

www.australianclimate.net.au

www.soilwaterapp.net.au

Spare

Some home truths on measuring soil water and PAWC

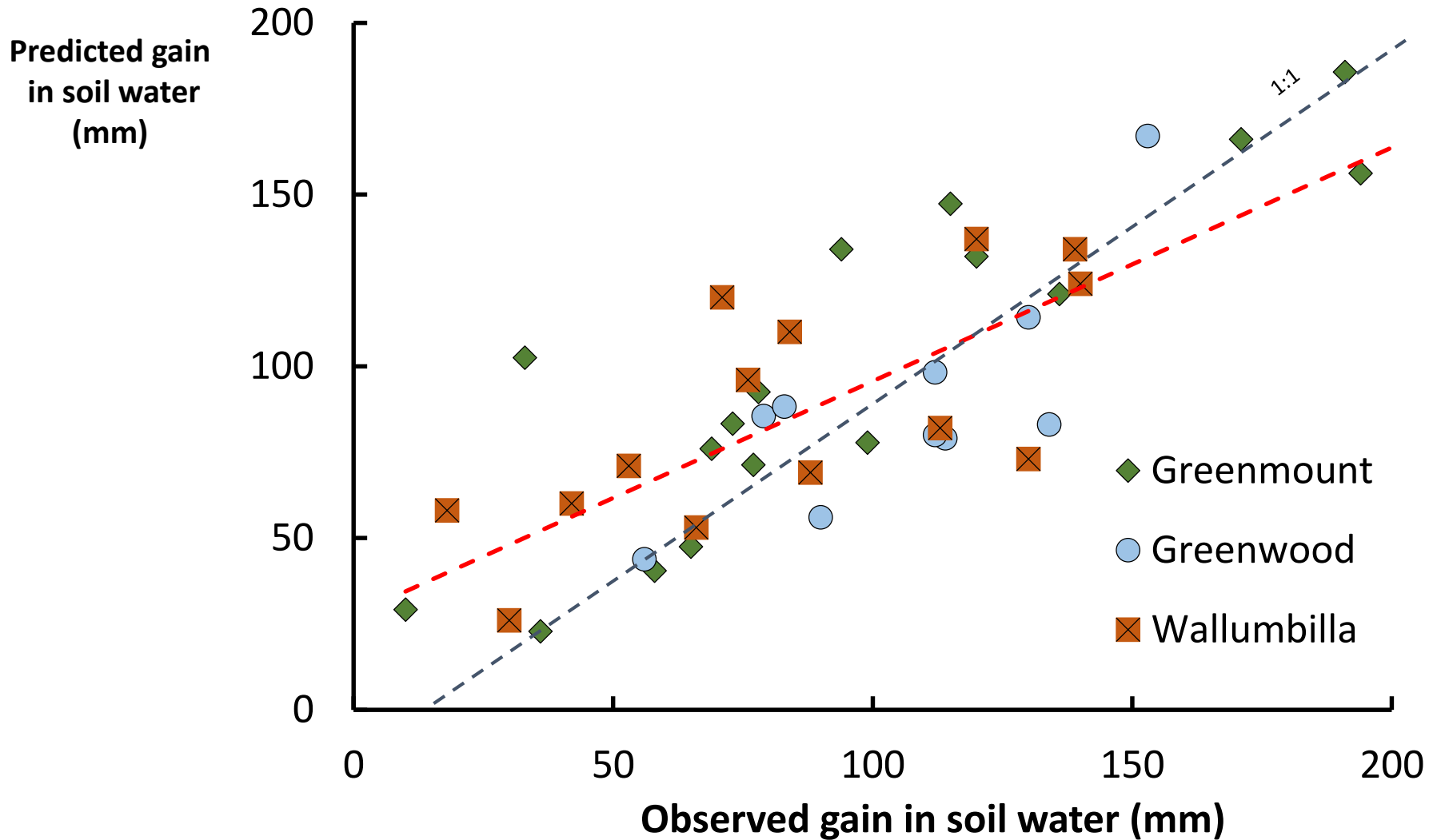


For a sample date varied by + and - 40 mm from the mean for a sample data (nine cores/treatment)

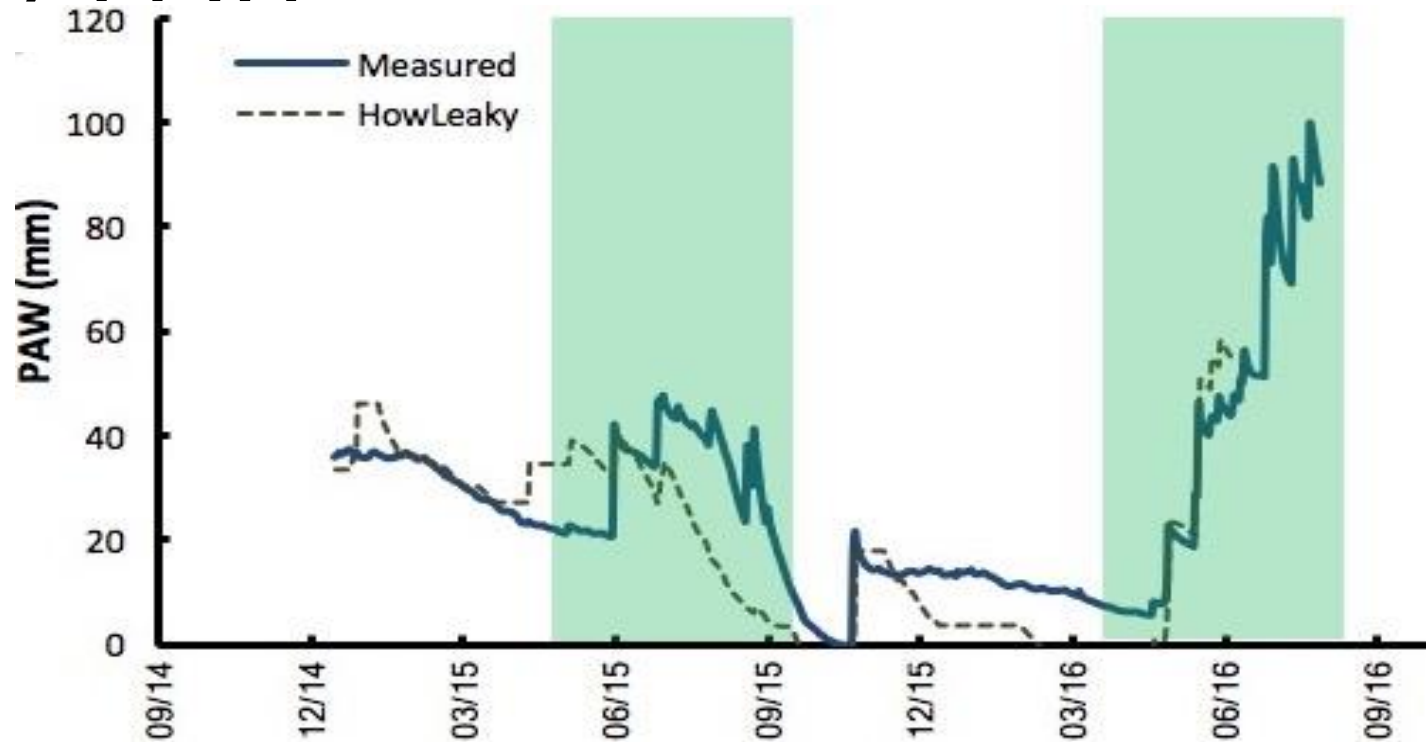
PAWC varied by 45 mm within 5-20 ha sites.

Prediction

Model explains 70% of field observations



Measured and modelled daily PAW



Raywood, Victoria 2015/16 (200- 1000 mm soil profile) Green shading indicates the crop phase.
Courtesy Dale Boyd