

RUBICON WATER

Maximising the productivity, profitability and sustainability of
agricultural water





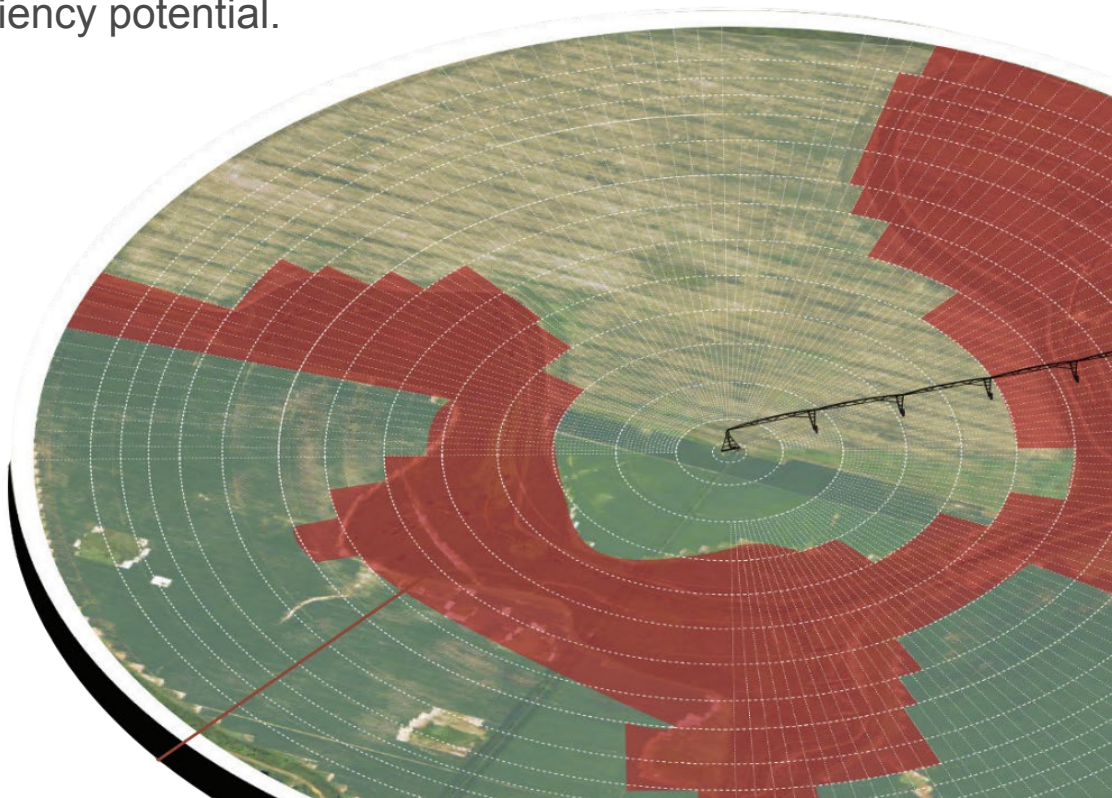
SOLUTIONS



Canal Solutions

Precision Application requires an On-Demand Supply

- It's important to get the application volume right, otherwise irrigators will either over irrigate or under irrigate
- When irrigating at a constant flow rate, the applied volume is determined by the irrigation duration.
- Flexible irrigation start times and durations are required to achieve on-farm efficiency potential.



Application Water Savings –

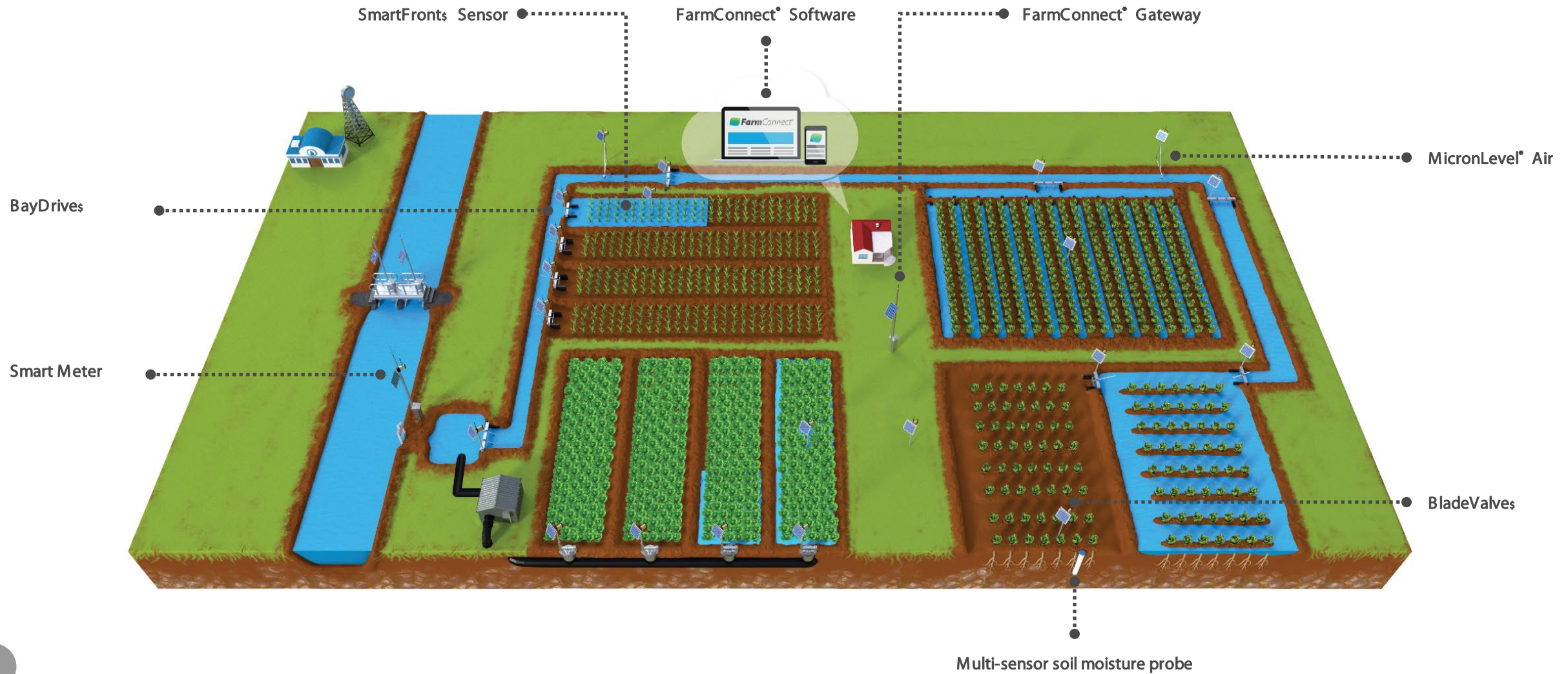
Reducing Application Losses by Precise Supply of Water to the Root Zone





On-Farm Solutions

On-Farm Implementations





Metering – Canal Supply

- Measure actual water order delivered in real time
- Respond during an irrigation program if measurement exceeds threshold





Metering – Canal Supply

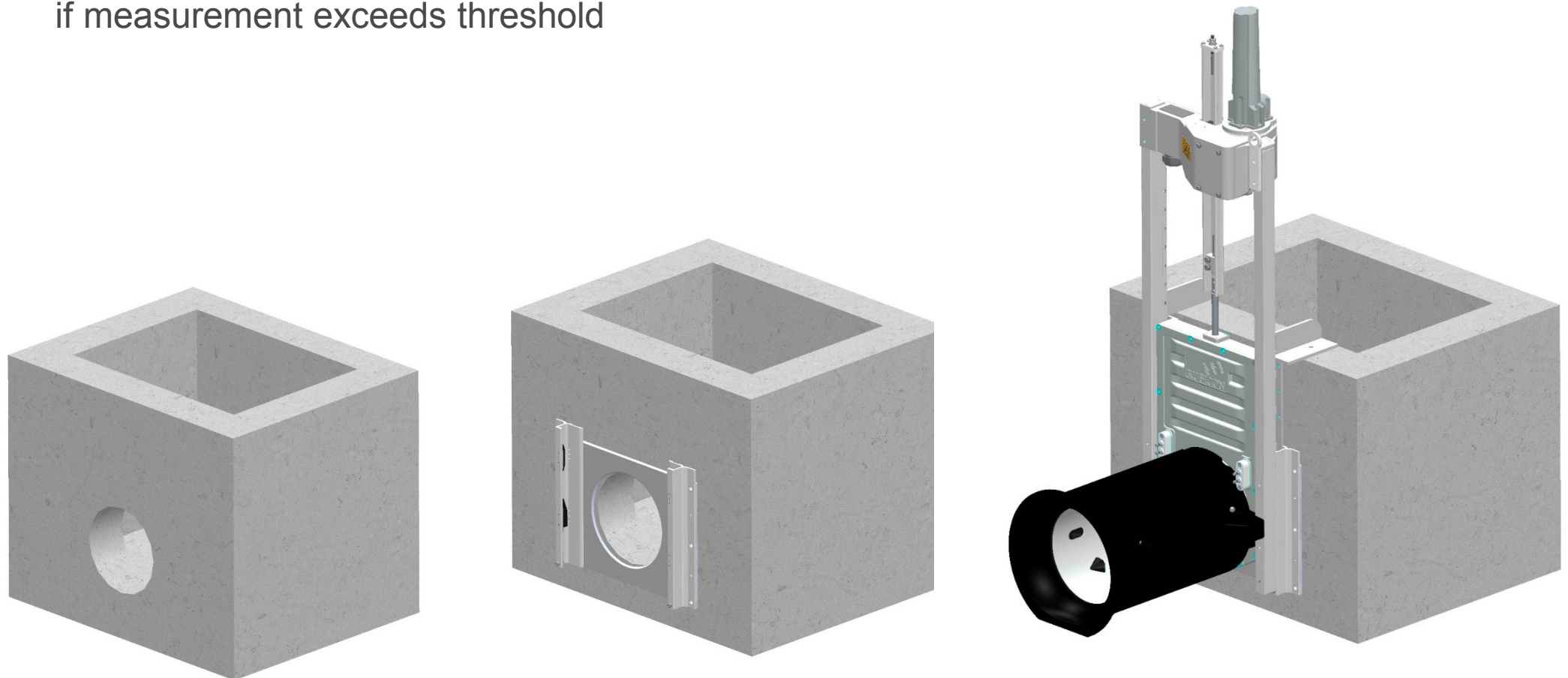
- Measure actual water order delivered in real time
- Respond during an irrigation program if wetting advance varies from planned





Metering – Tail Water

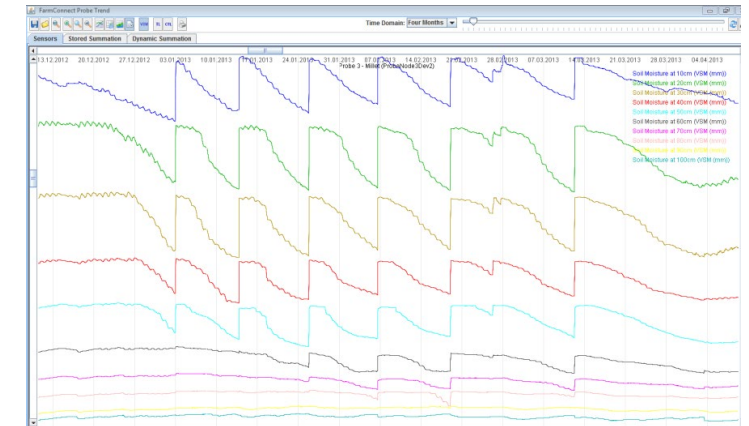
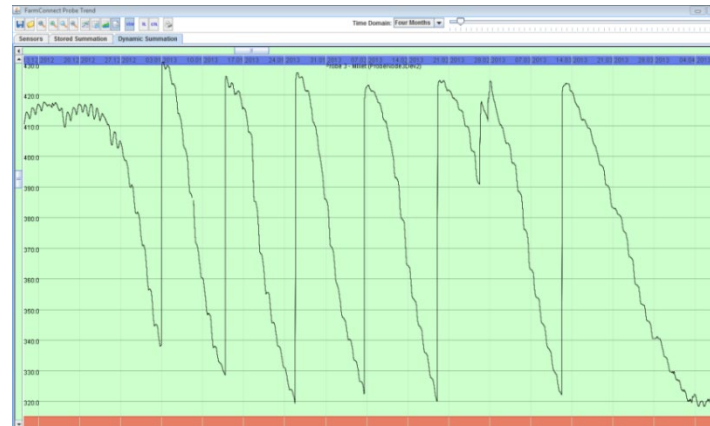
- Measure actual tail water in real time
- Respond during an irrigation program if measurement exceeds threshold

















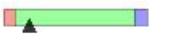









Crop

- Soil moisture status from field sensors
- Soil moisture status from estimated from ETc data
- Manage according to crop Growth stage
- Receive alerts that impact on crop health



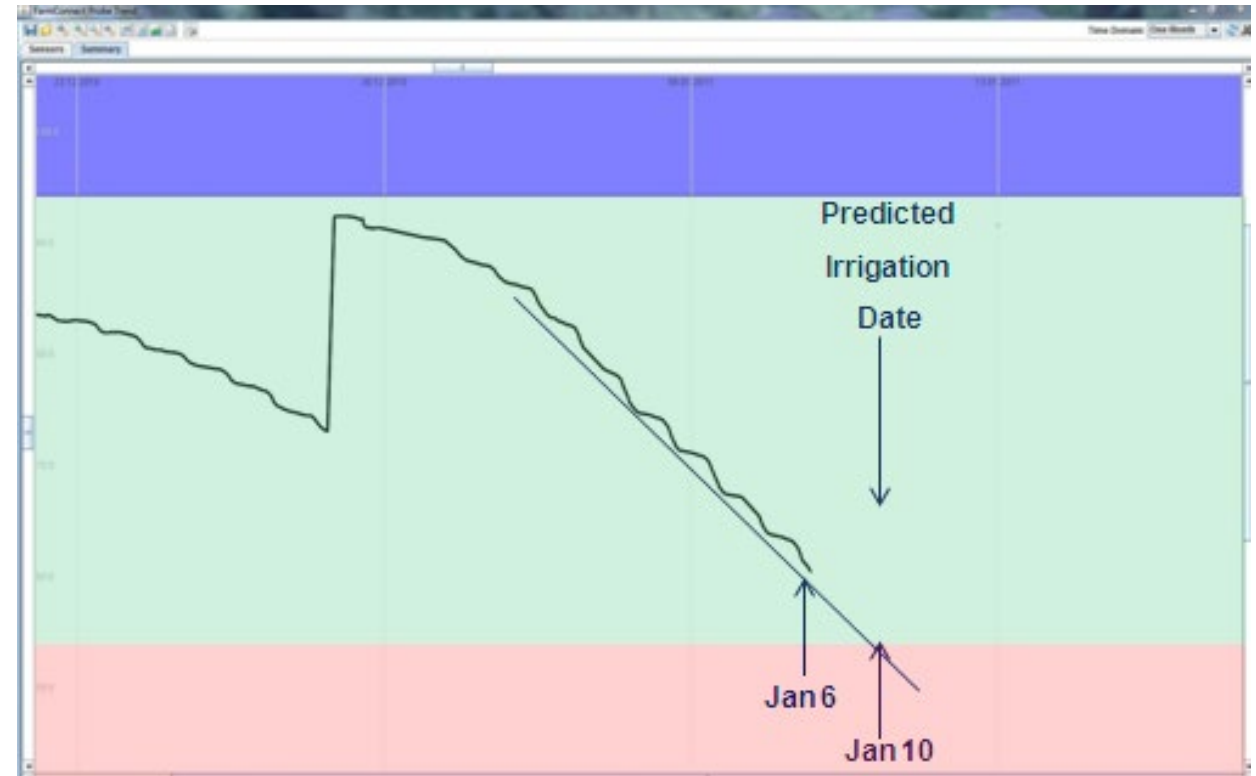
Soil Moisture Monitoring

Selected Probe:							     		
Device	Device ID	Bay	Last Updated	Moisture Level	Days	Predicted Date			
Probe 4 - Maize	ProbeNode4Dev2	Bay 2A	09/04/2013 11:27			Irrigate Now			
Probe 3 - Millet	ProbeNode3Dev2	Bay 3A	09/04/2013 10:31			Moisture Climbing			
Probe 1 - Lucerne	ProbeNode1Dev2	Bay 5B	09/04/2013 11:26		7	16/04/2013 21:52			
Probe 2 - Annual P...	ProbeNode2Dev2		09/04/2013 11:25			Moisture Climbing			



Predict

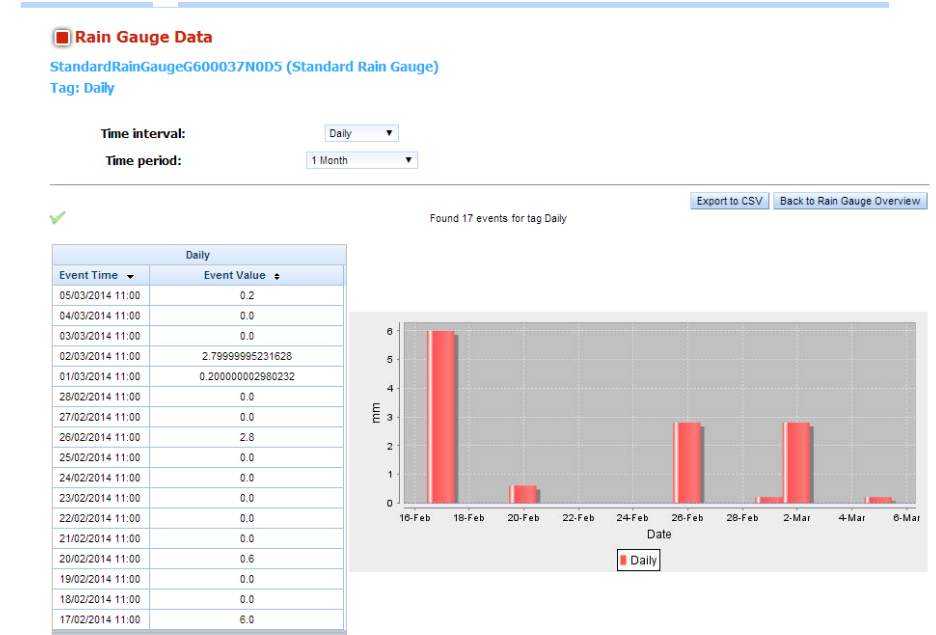
- Measure actual soil moisture status
- Predict next irrigation date
- Estimate next irrigation run times
- Estimate required flow rate
- Receive management alerts





Weather

- Access weather service data – district
- Access hyper-local weather data – on farm:
 - reference crop evapotranspiration - ET_0
 - Solar Radiation
 - Record actual rainfall
 - Review past conditions
- Data is incorporated into prediction algorithm
- Receive management alerts





Predict

FarmConnect SKIP

In order for us to be able to estimate the water use requirements on irrigation area Cotton 1, please answer the following questions about the crop planted in this area.

* Required

What type of crop is currently or will be planted in the area? *

- Please Select -

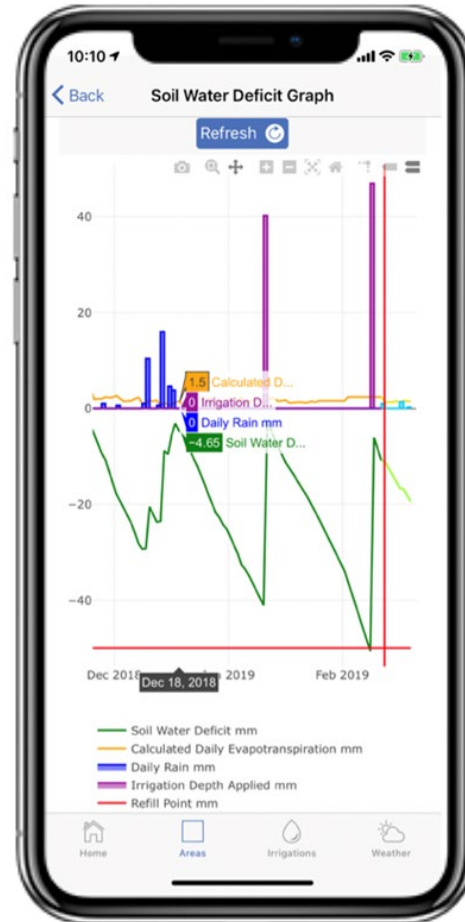
What was the date of emergence for the crop (please estimate if yet to emerge)? *

At the date of emergence, how fully was the crop irrigated as a percentage, where 0% is completely dry and 100% is fully irrigated?

0 100 **0%**

What is the current refill point of the crop in millimetres (please use refill point at emergence date if yet to emerge)?

NEXT




Area Status - a

summary deficit history

Deficit Prediction(Days) 2

2 Day Rain forecast(mm) 7.0

Refill  Full

Forecast Soil Water Deficit
-20 mm
(10/24/18, 11:33 AM)

Soil Water Deficit – Summary and Forecast

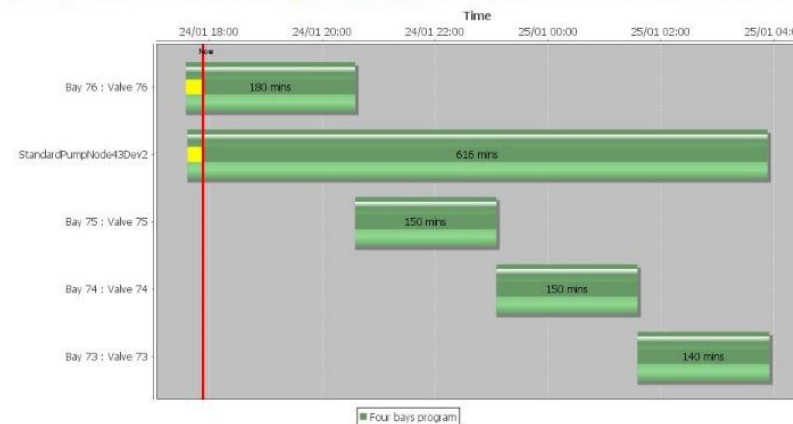


Irrigate

- Precisely execute automated irrigation schedules
- Monitor irrigation program in progress
- Determine remaining runtime for current bay
- Receive management alerts

- Receive reminder alerts to manually execute an irrigation sequence

Irrigation Action	Occurs After	Duration (mins)	Adj duration	Start Time	Finish time	Actual start time
		Adjust Remaining Durations	(mins)			
Irrigate Bay 76 (Valve 76)	Program Start Time	180	180	24/01/2018 17:35	24/01/2018 20:35	24/01/2018 17:35
Run pump StandardPumpNode43Dev2	Program Start Time	616	616	24/01/2018 17:37	25/01/2018 03:53	
Irrigate Bay 75 (Valve 75)	Irrigate Bay 76 (Valve 76)	150	150	24/01/2018 20:35	24/01/2018 23:05	
Irrigate Bay 74 (Valve 74)	Irrigate Bay 75 (Valve 75)	150	150	24/01/2018 23:05	25/01/2018 01:35	
Irrigate Bay 73 (Valve 73)	Irrigate Bay 74 (Valve 74)	140	140	25/01/2018 01:35	25/01/2018 03:55	





Irrigate

- **BayDrive**
- Ideal for actuating rubber flap gates for outlets for applying water to fields
- Engineered and manufactured for long life
- Fit for purpose





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Irrigate

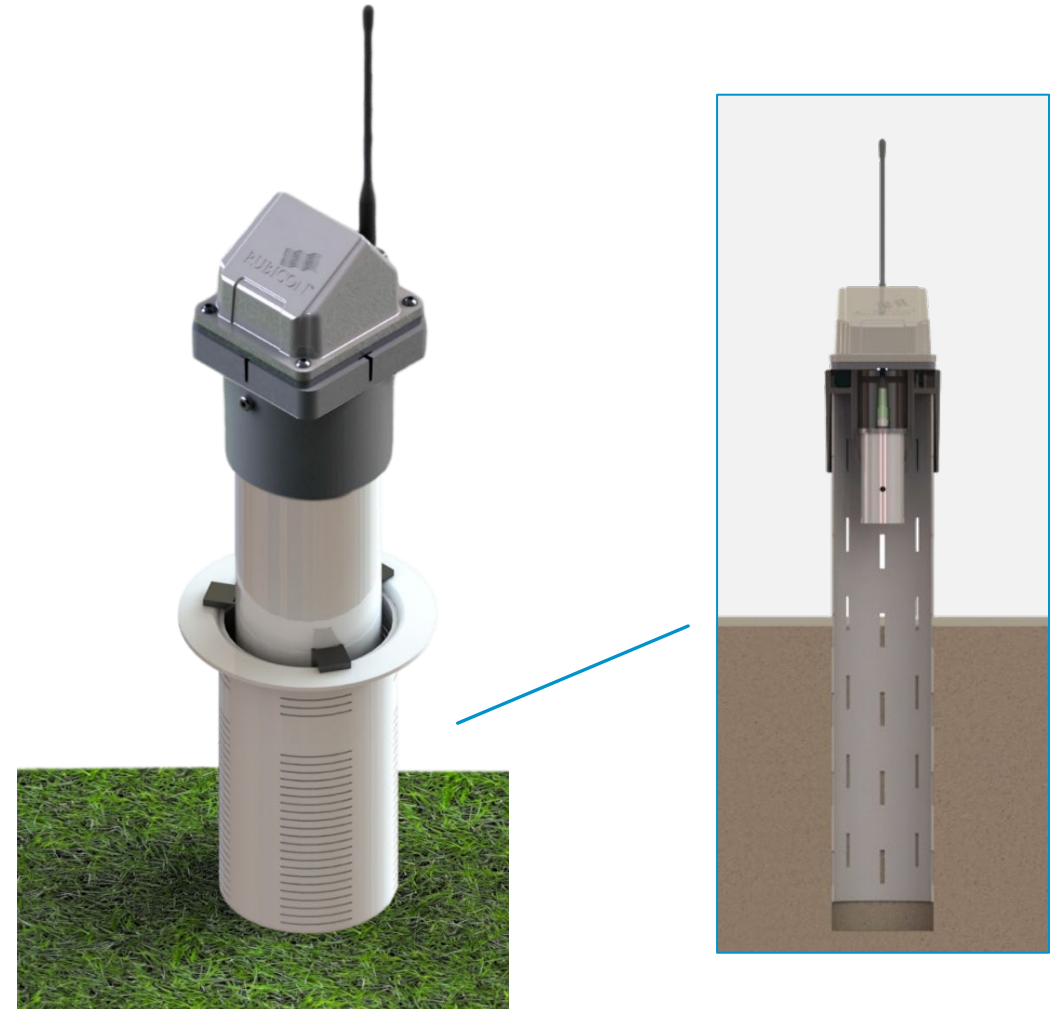
- **BladeValve**
- Fits 15inch vertical riser pipes
- Large diameter for lower water velocity
- Closes and seals moderate pressure
- Engineered and manufactured for long life
- Fit for purpose





Adapt

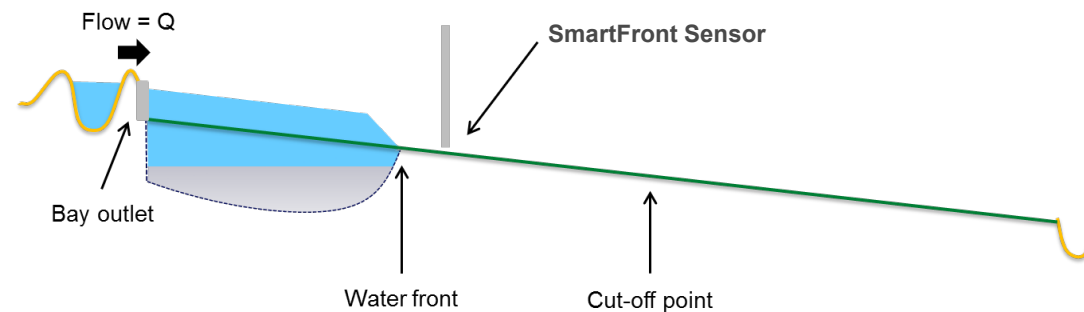
- **SmartFront Sensor**
- Algorithm determines optimal cut-off point to limit under/over irrigation
- Each irrigation can vary due to;
 - Antecedent soil moisture
 - Crop hydraulic resistance (stage of growth)
- Detects water front midway along the bay/furrow and dynamically calculates when to shut-off the irrigation
- Utilises Rubicon's precision acoustic measurement technology





Adapt

- **SmartFront Sensor**
- Adapt irrigation based on real-time conditions
- Variables such as seasonal changes in ground cover or different soil moisture content can change the runtime
- Essential to ensure water application efficiency
- Irrigation is completed without incurring tail water losses





Record

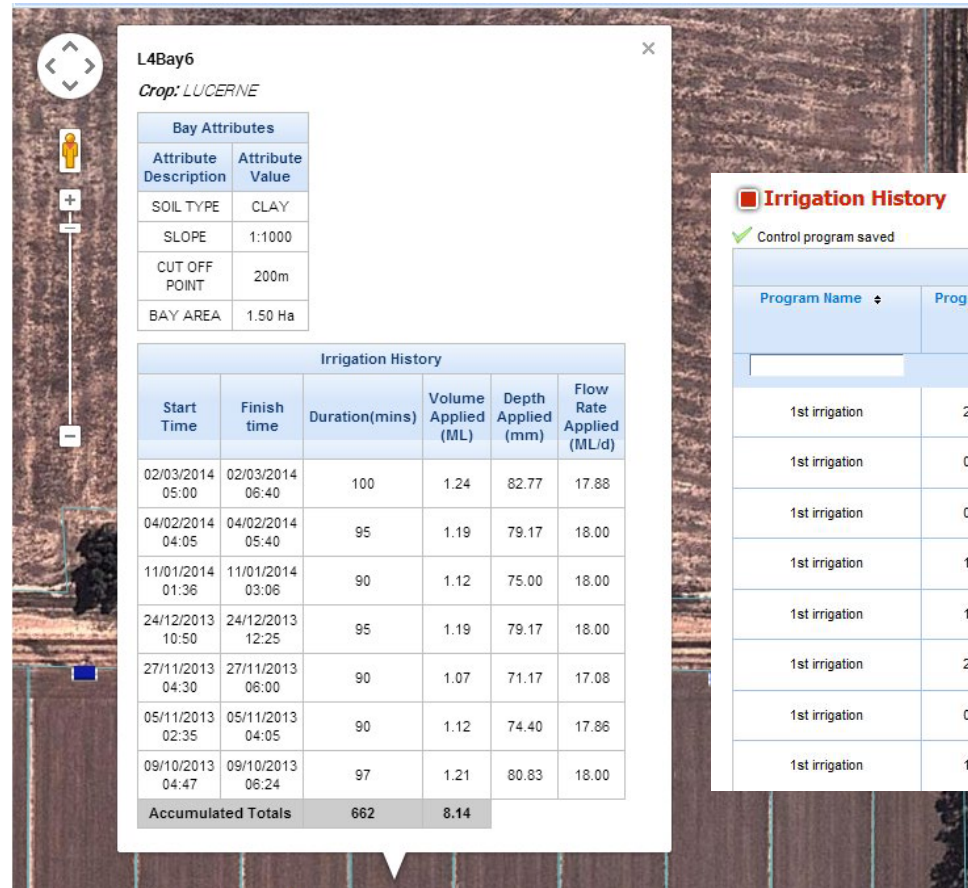
Manually enter for later analysis:

- Irrigation runtimes
 - Volume of water applied by crop and field
 - Flow rates applied
 - Non-water inputs
 - Harvest data
-
- Infield entry of irrigation start and stop times to electronically record irrigation shifts
 - Automatically determines volume of water applied by crop and field
 - Records flow rates applied



Analyze

- Track actual water use against predicted water use
- Track productivity against soil moisture, water applied, weather, irrigation program



L4Bay6
Crop: LUCERNE

Bay Attributes	
Attribute Description	Attribute Value
SOIL TYPE	CLAY
SLOPE	1:1000
CUT OFF POINT	200m
BAY AREA	1.50 Ha

Irrigation History					
Start Time	Finish time	Duration(mins)	Volume Applied (ML)	Depth Applied (mm)	Flow Rate Applied (ML/d)
02/03/2014 05:00	02/03/2014 06:40	100	1.24	82.77	17.88
04/02/2014 04:05	04/02/2014 05:40	95	1.19	79.17	18.00
11/01/2014 01:36	11/01/2014 03:06	90	1.12	75.00	18.00
24/12/2013 10:50	24/12/2013 12:25	95	1.19	79.17	18.00
27/11/2013 04:30	27/11/2013 06:00	90	1.07	71.17	17.08
05/11/2013 02:35	05/11/2013 04:05	90	1.12	74.40	17.86
09/10/2013 04:47	09/10/2013 06:24	97	1.21	80.83	18.00
Accumulated Totals		662	8.14		

Irrigation History

Control program saved

Program Name	Program start time	Finish Time	Program status	Program Successfully Executed
1st irrigation	22/02/2016 17:00	23/02/2016 05:50	Executed	<input checked="" type="checkbox"/>
1st irrigation	07/05/2016 11:00	07/05/2016 22:41	Executed	<input checked="" type="checkbox"/>
1st irrigation	05/03/2016 09:00	05/03/2016 21:16	Executed	<input checked="" type="checkbox"/>
1st irrigation	16/12/2015 10:10	16/12/2015 23:00	Executed	<input checked="" type="checkbox"/>
1st irrigation	15/11/2015 15:00	16/11/2015 01:49	Executed	<input checked="" type="checkbox"/>
1st irrigation	26/11/2015 21:29	27/11/2015 10:19	Executed	<input checked="" type="checkbox"/>
1st irrigation	08/10/2015 15:30	09/10/2015 02:19	Executed	<input checked="" type="checkbox"/>
1st irrigation	19/10/2015 13:56	20/10/2015 00:45	Executed	<input checked="" type="checkbox"/>

Solution that addresses the need of irrigators

- Productivity
 - Quality
 - Labour saving
 - Cost savings
 - Water use efficiency
-
- Today what is it happening now
 - Tomorrow when it is going to happen
 - Yesterday how & why it happened



THANK YOU

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