

Soil Moisture Sensors for Cranberry Growers

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Overview

Why is this project important to growers?

Year 1 - testing sensors in field

Year 2 - testing telemetry components

Key takeaways

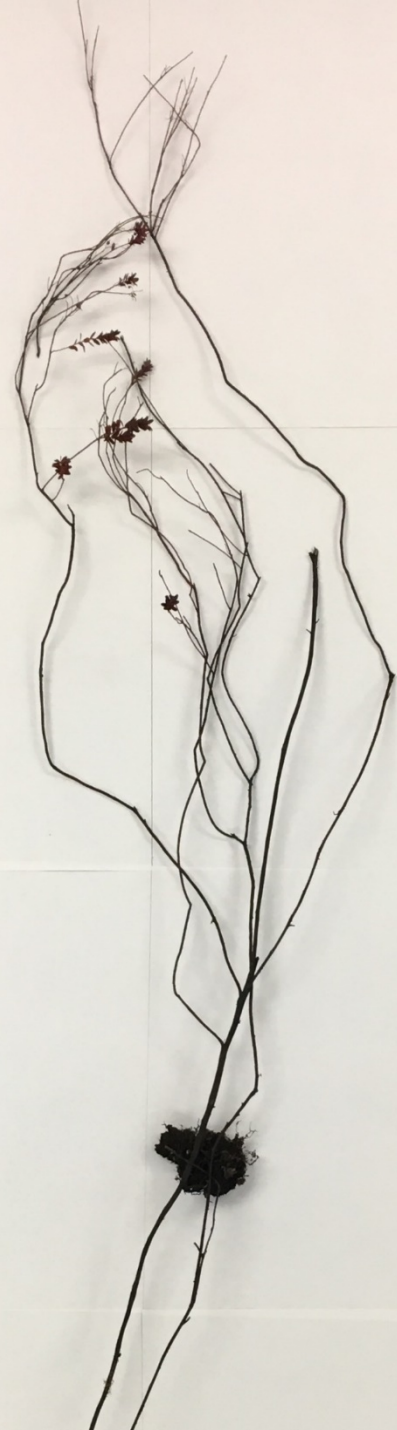
Why this project?

Canopy issues

Poor rooting

Overwatering

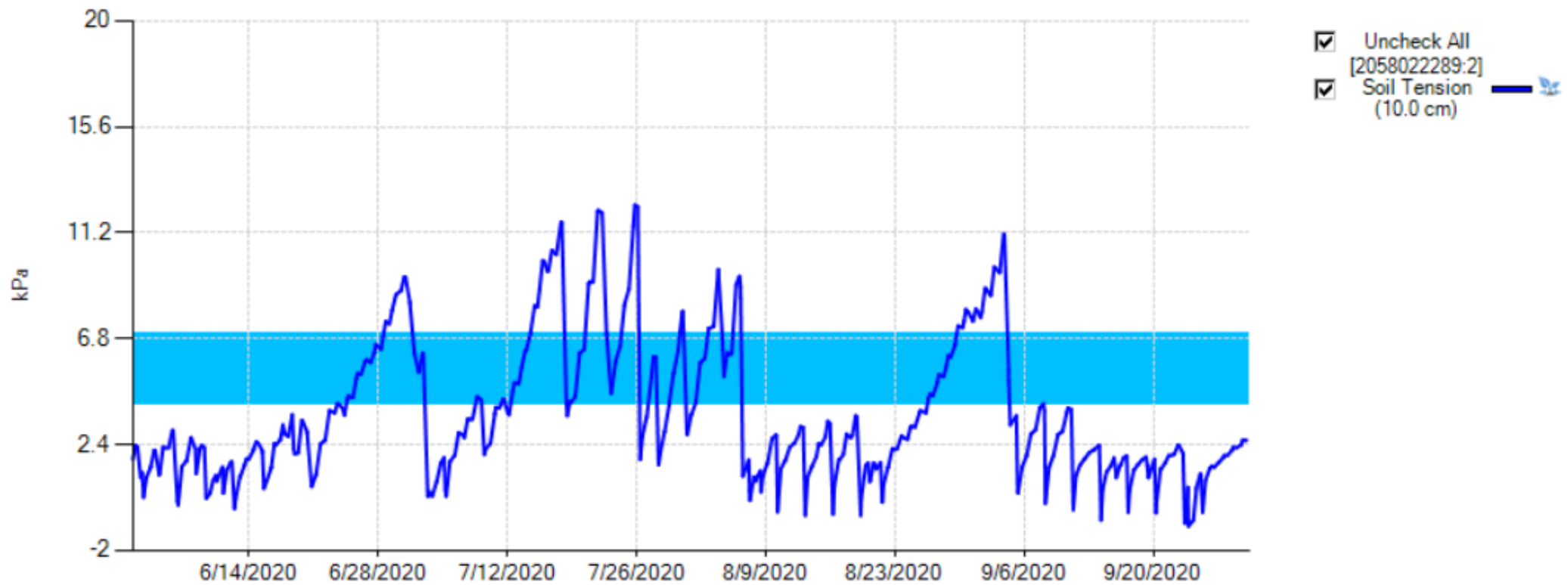
Hortau





BY TYPE - SOIL TENSION

BACK ←

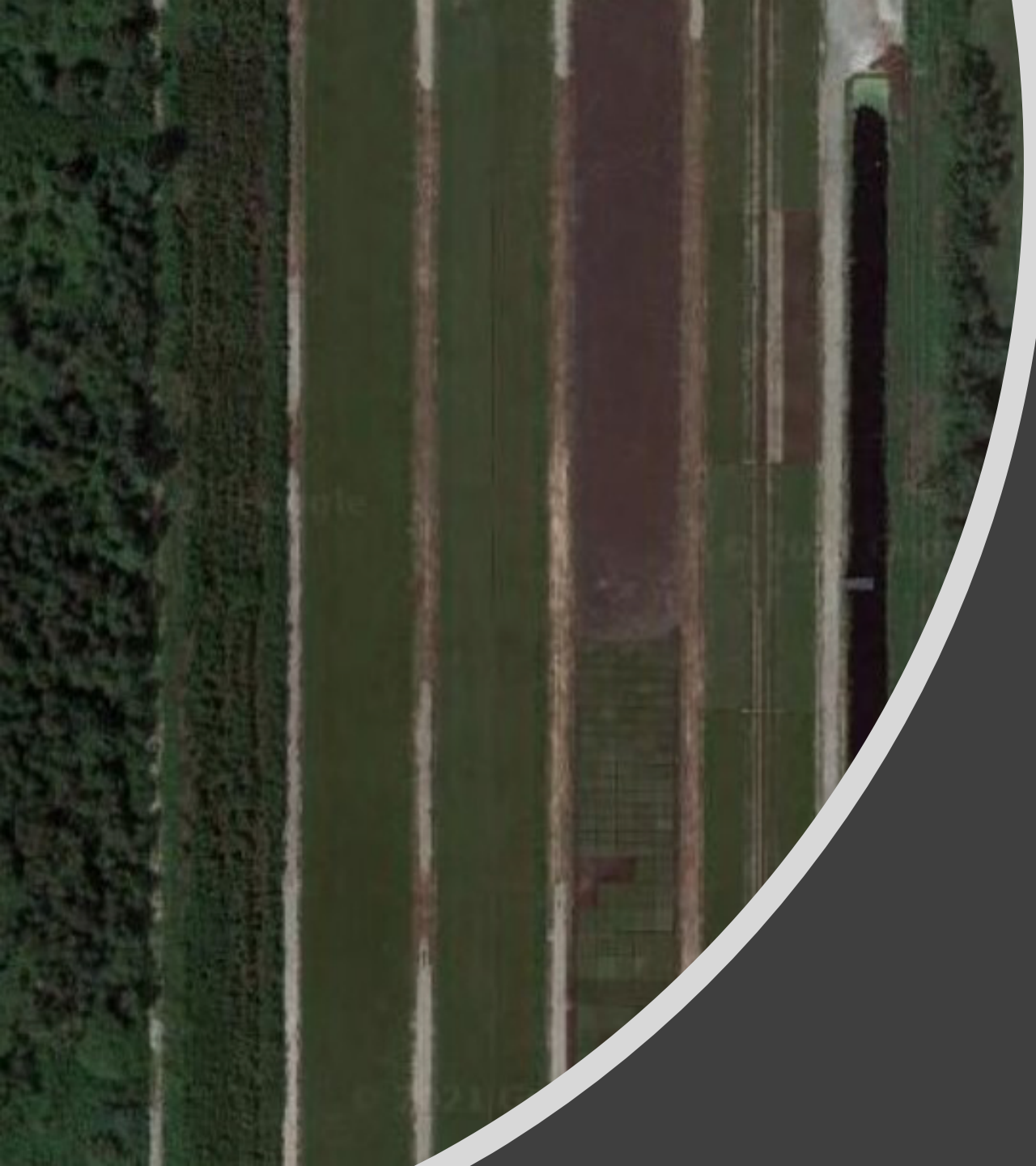


So, we have some areas to improve on...

Some overwatering, and occasional underwatering
(summer spikes)

Some canopy issues and poor rooting

A sensor that works, but it's expensive



BCCRF irrigation guinea pig

Contacted irrigation companies

Reviewed quotes and sensors

Industry review



GroPoint

Spectrum
SM 100

Irrrometer

Meter
Tensiometer

Acclima
310H

Watermark

Meter
Teros 12

Spectrum
FieldScout

Onset EC5

Ruled out crazy expensive sensors, ones that went too deep in soil, redundant ones, ones that had already been shown to not work...



Installed sensors

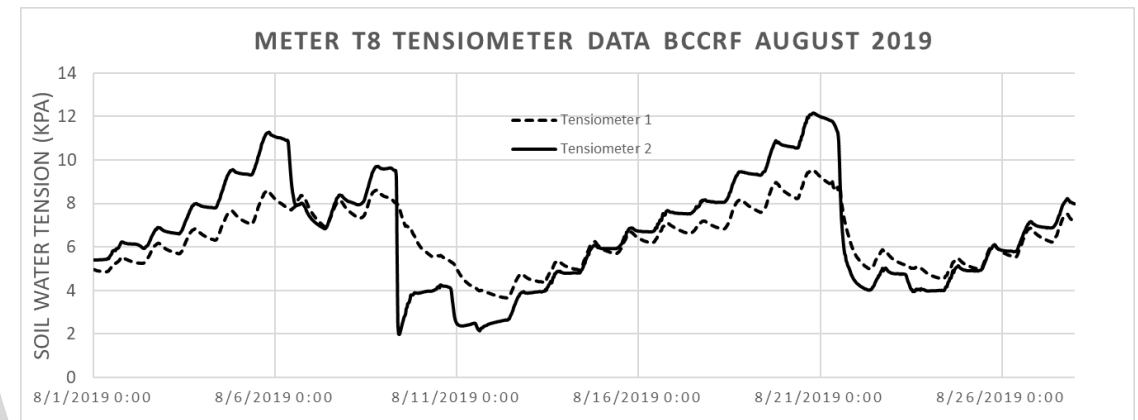
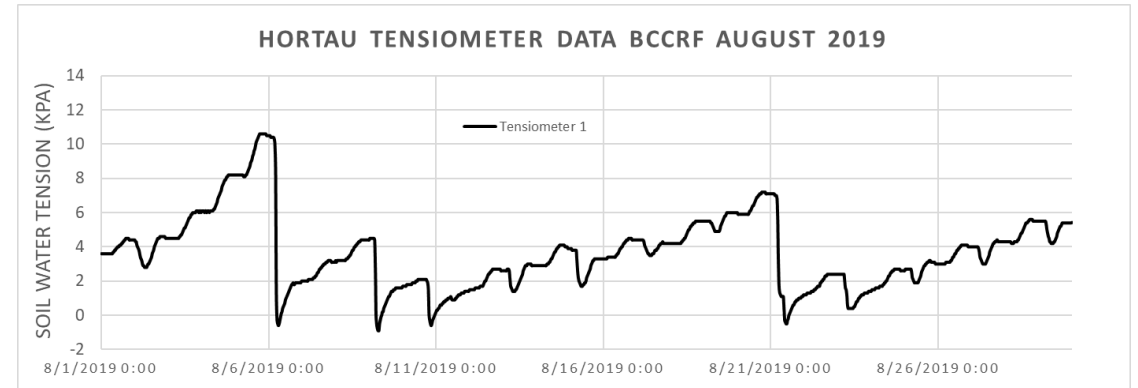
Peat, Mullica Queen

Tracked data all season

Hortau check

Results

- Meter tensiometer clear top performer and significantly less expensive than Hortau tensiometer (and you purchase, not lease).
- Tensiometers seem preferable over devices that give VWC readings (irrigation thresholds less well-understood for VWC, particularly in BC).
- Spectrum FieldScout is a good portable tool to “diagnose” wet or dry spots in a field.



Sensor Review Summary (CAD \$)

	Logger	Sensor	Relative Cost	User-Friendliness	Accuracy	Cran Suitability	Overall Score	Recommended
Meter T8 Tensiometer (now Teros 32 Tensiometer)	\$965	\$600						Yes
Spectrum FieldScout TDR 350 Moisture Meter	~\$2000							Yes
Acclima 310H Sensor	\$450	\$370						TBD
Spectrum SM 100 Soil Moisture Sensor	\$860	\$130						No
Onset EC5 Soil Moisture Smart Sensor	\$295	\$215						No
Meter Teros 12	\$965	\$185						No
Irrrometer LT (Low Tension)	\$725	\$150						No
WaterMark Soil Moisture Sensor	\$330	\$60						No
GroPoint Lite Sensor	\$650	\$295						No

	Poor
	Fair
	Good

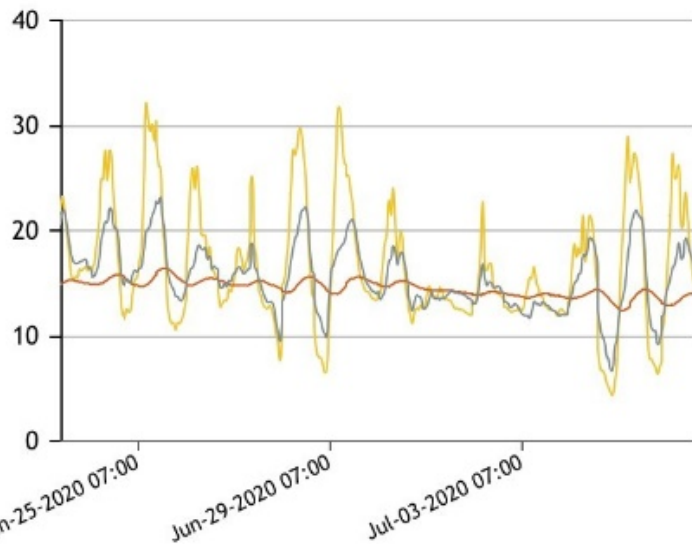


2020 Focus: telemetry components – can the data reliably be sent to your phone/computer and is it user-friendly?

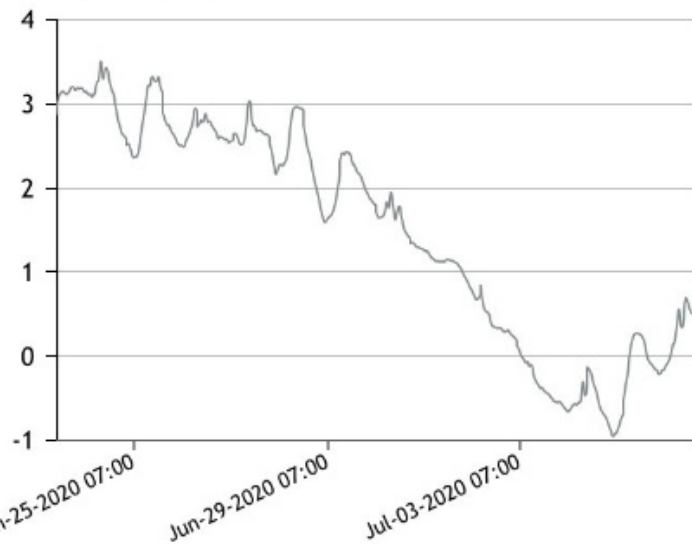


Field 3

Station (5'), In-Canopy, and Soil Temperature - Temperature (°C)



Soil Moisture - Matric Potential (kPa)



BCCRF

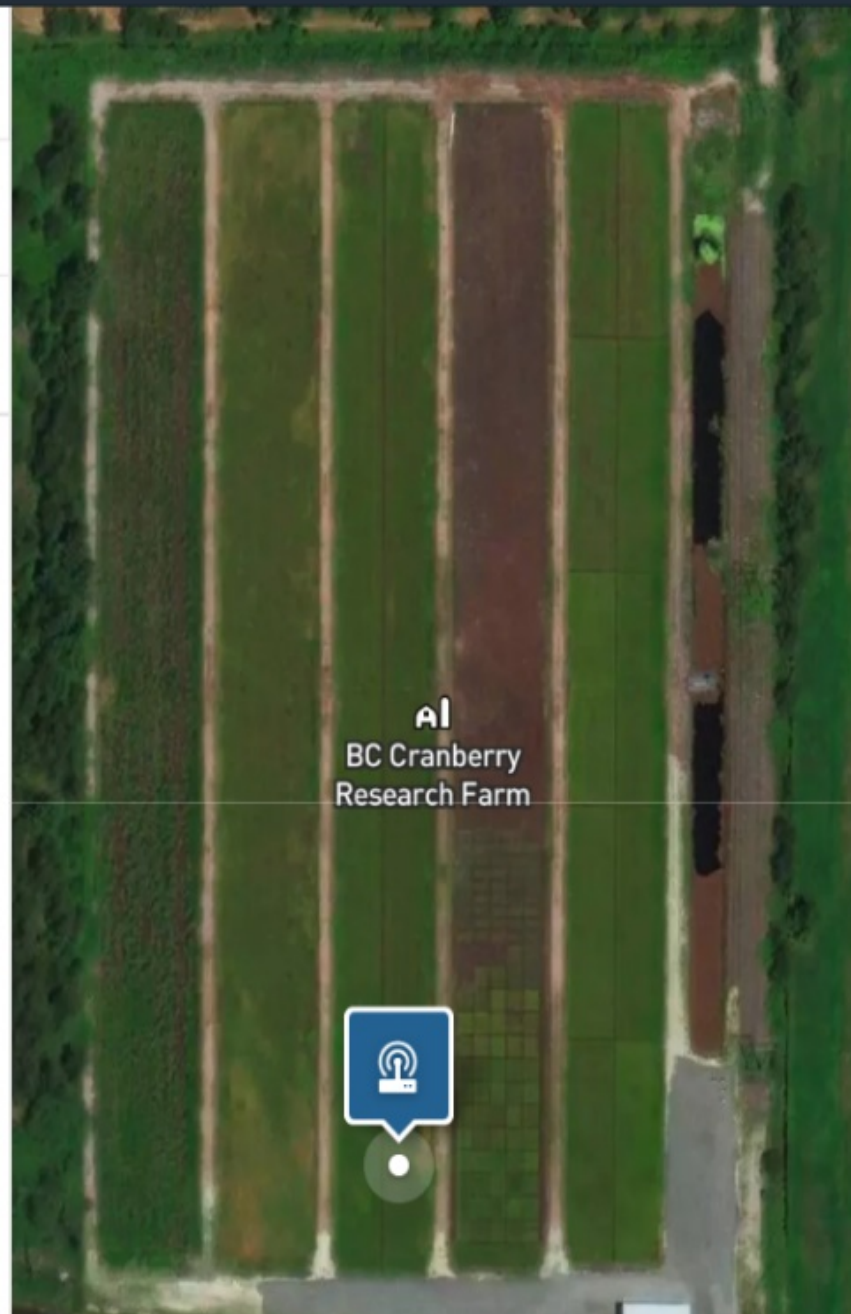
Field 3



BCCRF ZL6 Logger



Meter's Online Platform

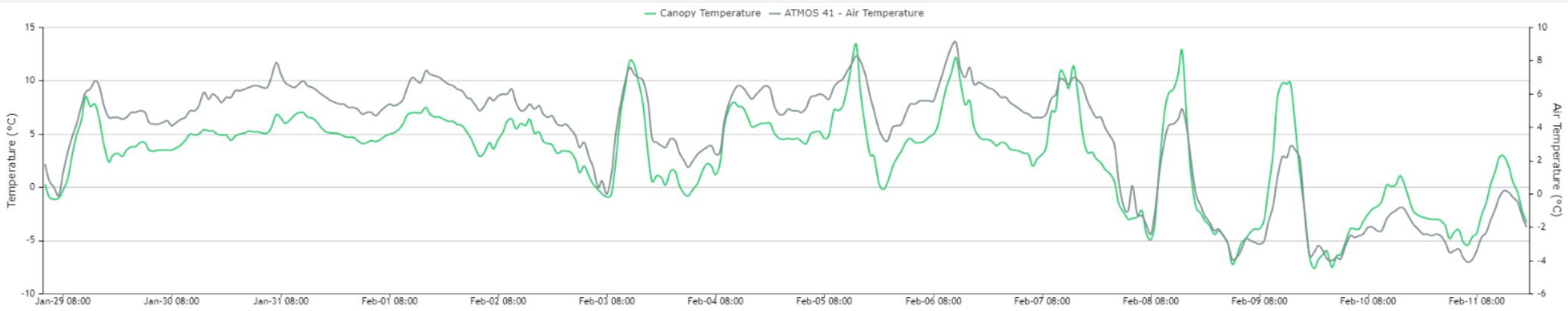


Collapse All

Report: Field 3

Air and Canopy Temperature BCCRF

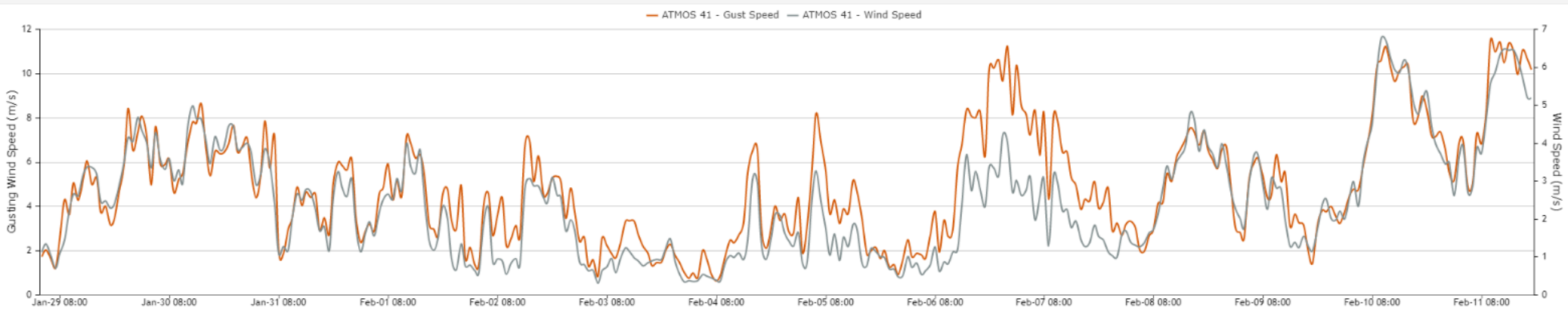
Jan-28-2021 - Feb-11-2021



MAX	MIN
9.1 °C	-4.1 °C
ATMO5 41 - Air Temperature	
13.4 °C	-7.6 °C
Canopy Temperature	

Wind Speed

Jan-28-2021 - Feb-11-2021



MAX	MIN
6.74 m/s	0.31 m/s
ATMO5 41 - Wind Speed	
11.47 m/s	0.64 m/s
ATMO5 41 - Gust Speed	

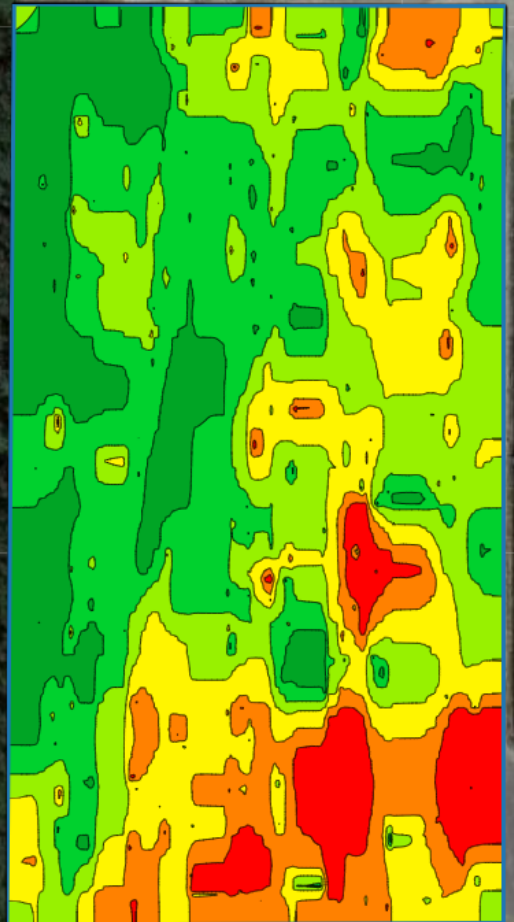


BCCRF: Cranberry Fields: % VWC [Close]

Contour [Statistics]

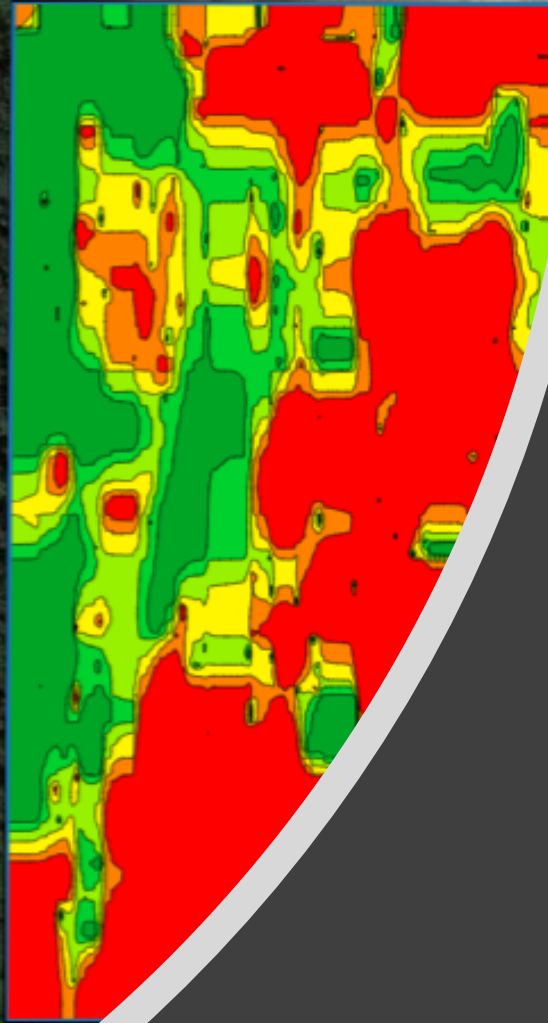
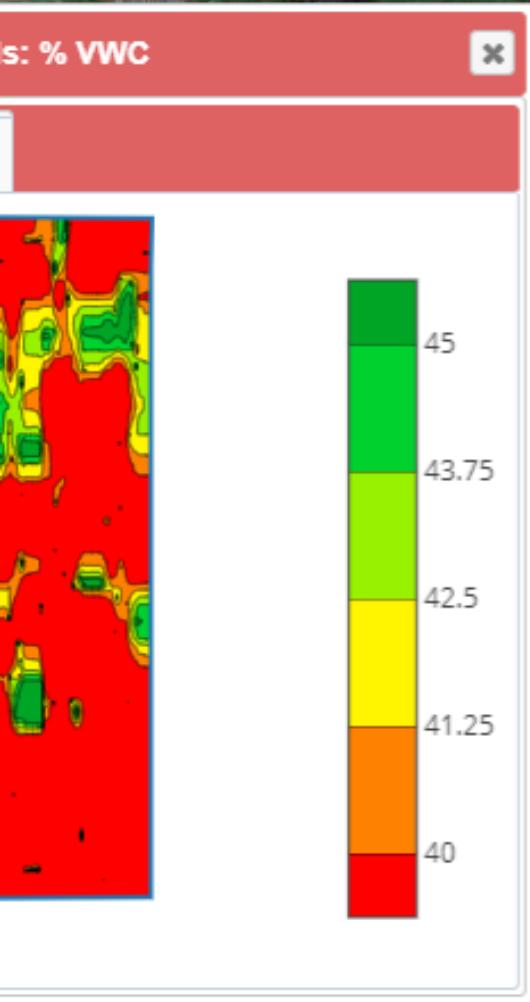
45
41.25
37.5
33.75
30

[North Arrow]



Key takeaways and now what?

- There is room to improve and fine tune irrigation in BC, we're in the early stages of understanding what that looks like.
- A good tensiometer is needed for BC peat, don't waste your money on cheap sensors. You'll just get annoyed and give up on the whole concept!
- If I was a grower, I'd be getting the Spectrum FieldScout TDR 350 and making maps of my fields and understanding patterns in the vines/yields.
- Next step, stationary season-long monitoring with the Meter tensiometer, learn how the numbers fit with your fields and comfort level, then MAYBE automation.





Thank you!

Questions?

Thank you to the BCCRF, BC cranberry growers, BCCMC, Ocean Spray Cranberries, and Investment Agriculture Foundation for project support.