Soil Moisture: Lessons Learned

Rebecca Shortt & Kathryn Carter

Water – community of practice meeting

7 April 2016

- WRAMI and WAMQI through Farm and Food Care

Ontario Tender Fruit Growers

Grape Growers of ONTARIO

ONTARIO APPLE GROWERS

Conclusions

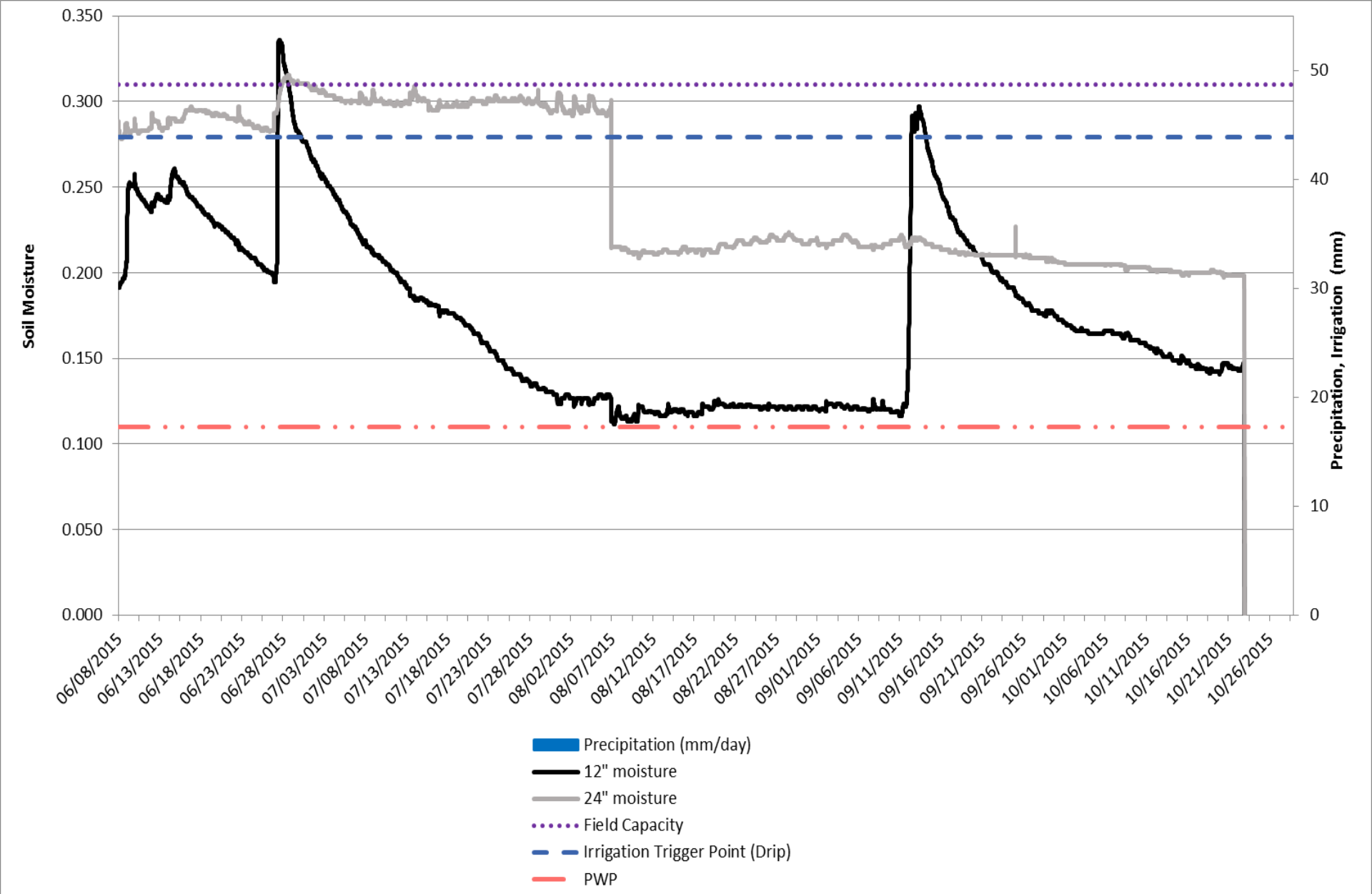
- There is opportunity to increase agricultural production (quality and/or quantity) in Ontario by increasing irrigation.
- Economic analyses are required to determine which commodities have the greatest potential impact not only for that sector but for the entire agri-food sector.
- Water Balance studies are required so that farmers can have access to information about where water supplies are available.

Conclusions

- Technology doesn’t always perform as effortlessly as one would hope
- Cost is still relatively high (~$1,500 for wireless reporting station and 2 probes – adds ~5% to the cost of a relatively large irrigation system 30+ acres)
- Probe data should be used for relative values (trends) not absolute values (could go to absolute values with more expensive probes and extensive calibration)

Opportunities/Gaps

- Greater weather monitoring (ET)
  - Especially outside of grape growing areas (Georgian Bay, Eastern Ontario)
- Synthesising/understanding/making accessible the information about water availability through Source Water Protection
- Support (technical, regulatory/governance, financial) for developing water supplies and water supply infrastructure
- Monitoring of climate change and economics to identify the optimal investment time


Soil Moisture
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
Precipitation, Irrigation (mm)
50
40
30
20
10
0
06/08/2015
06/13/2015
06/18/2015
06/23/2015
06/28/2015
07/03/2015
07/08/2015
07/13/2015
07/18/2015
07/23/2015
07/28/2015
08/02/2015
08/07/2015
08/12/2015
08/17/2015
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08/27/2015
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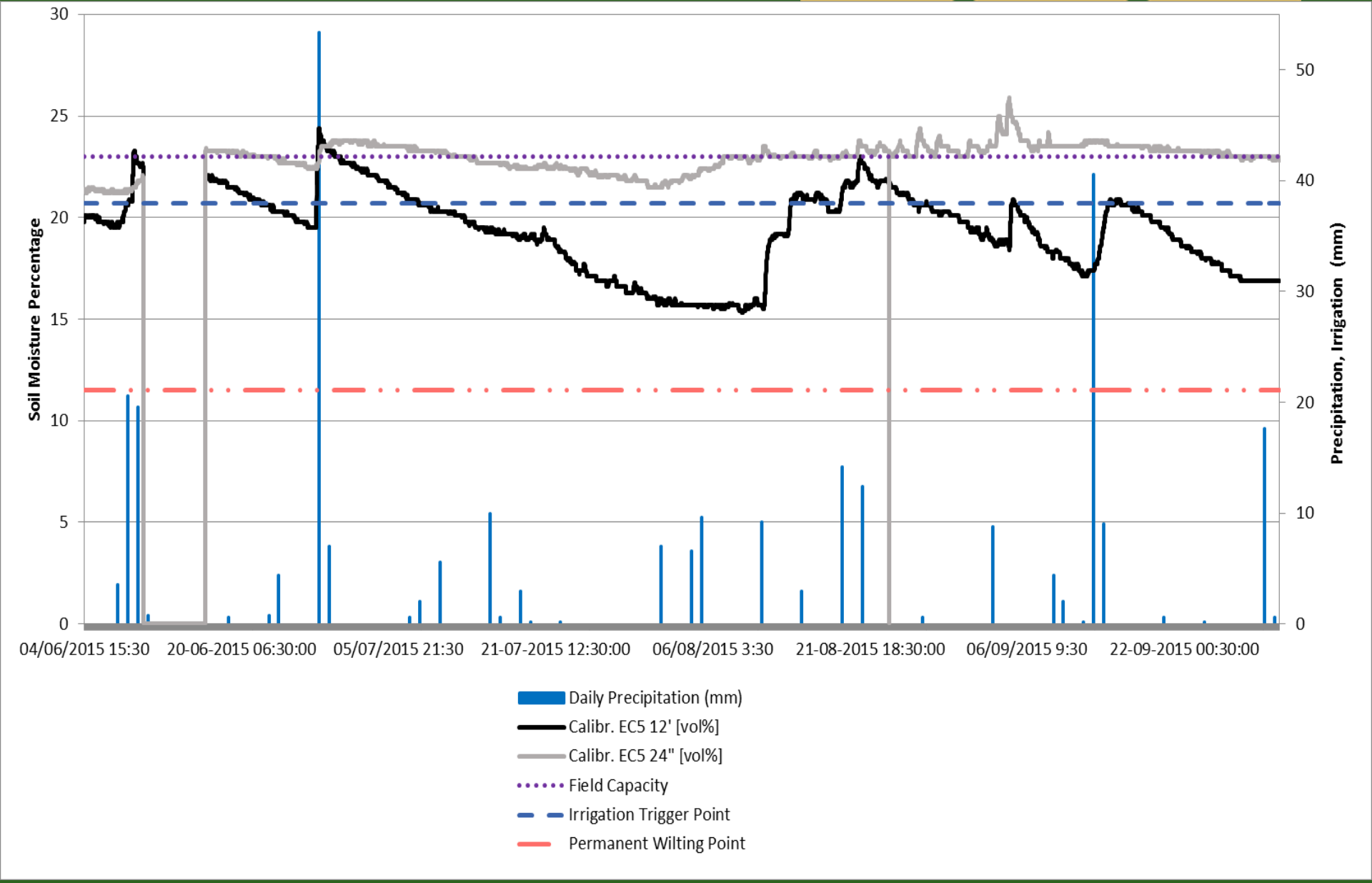
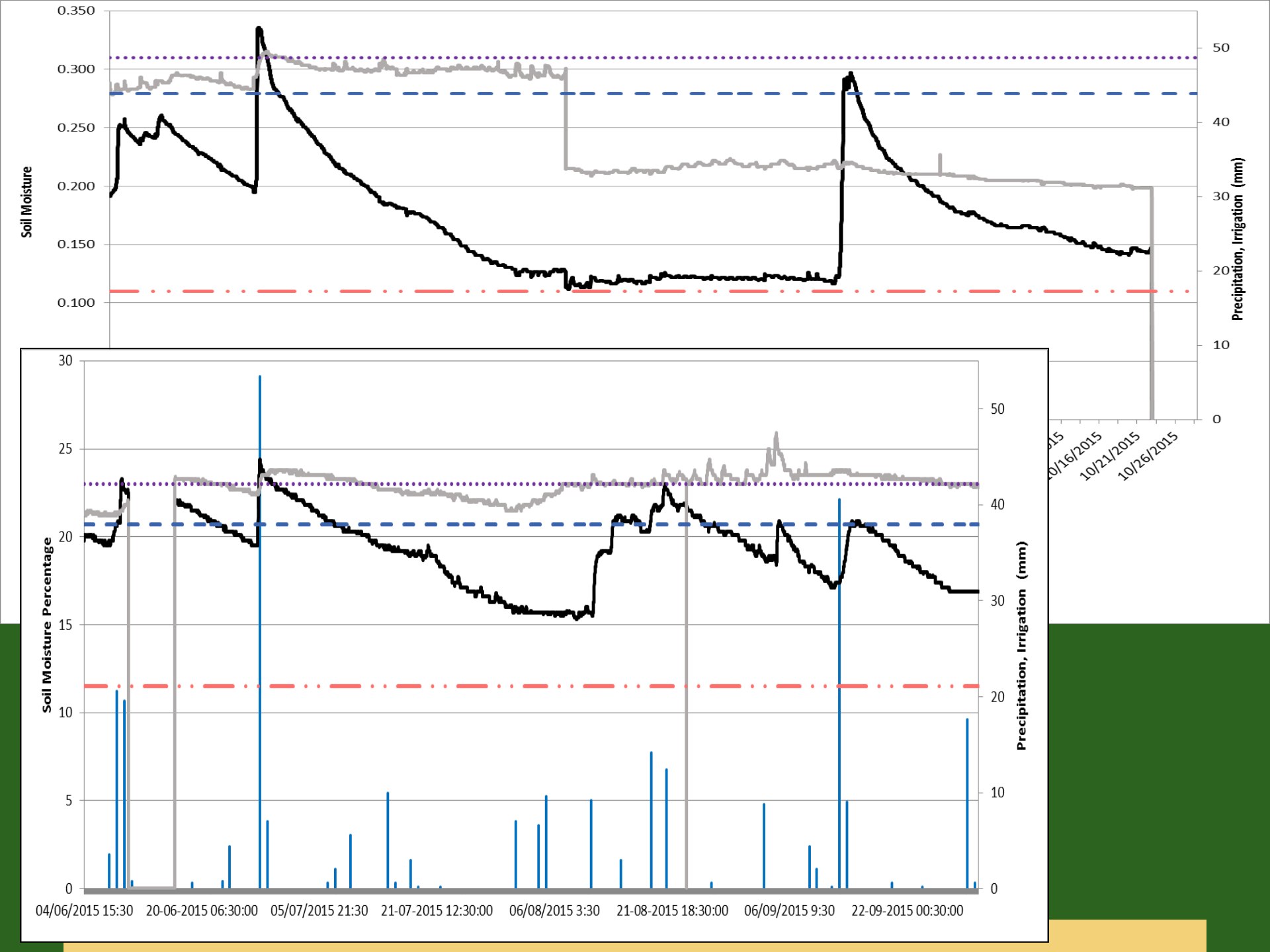
09/11/2015
09/16/2015
09/21/2015
09/26/2015
10/01/2015
10/06/2015
10/11/2015
10/16/2015
10/21/2015
10/26/2015
Precipitation (mm/day)
12" moisture
24" moisture
Field Capacity
Irrigation Trigger Point (Drip)
PWP


Soil Moisture Percentage
Precipitation, Irrigation (mm)
30
25
20
15
10
5
0
50
40
30
20
10
0
04/06/2015 15:30
20-06-2015 06:30:00
05/07/2015 21:30
21-07-2015 12:30:00
06/08/2015 3:30
21-08-2015 18:30:00
06/09/2015 9:30
22-09-2015 00:30:00
Daily Precipitation (mm)
Calibr. EC5 12' [vol%]
Calibr. EC5 24" [vol%]
Field Capacity
Irrigation Trigger Point
Permanent Wilting Point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21-08-2015 18:30:00
06/09/2015 9:30
22-09-2015 00:30:00


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Data Logger
ECH2O EC-5

- Soil moisture monitoring integrated into Fruit Tracker and Apple Tracker
- Grape irrigation economics calculator available on GGO website
- Scheduling workshops based on ET method available to grower groups by request
- OMAFRA hort videos series include soil moisture monitoring as well as irrigation system monitoring.

Frequency of drought and associated irrigation water demand calculated for Grapes in NOTL (1972-2007)				
Water demand period	25%	10%	5%	2007 actual conditions
	1 in 4 years	1 in 10 years	1 in 20 years	Exceeds a 1 in 20 year occurrence
2 week	2.1”	2.1”	2.1”	2.1”
4 week	3.9”	4.0”	4.0”	4.1”
8 week	6.9”	7.3”	7.4”	7.3”
90 day	8.9”	9.3”	9.5”	10.1”
16 week	9.1”	9.6”	9.8”	10.8”