Plant Propagation with Leaf Wetness Sensors

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IPPS
Sharing Plant Production Knowledge Globally

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Materials

- Dielectric Leaf Wetness Sensor
  - Measures dielectric constant of a zone above the leaf, which is a function of moisture on the sensor surface
  - Sensor outputs a mV signal proportional to amount of water on surface
  - Sensor mimics leaf radiation balance and water adsorption
- Decagon Devices

Materials

- Must work with a datalogger
  - CR1000 Datalogger
  - Campbell Scientific

Uses

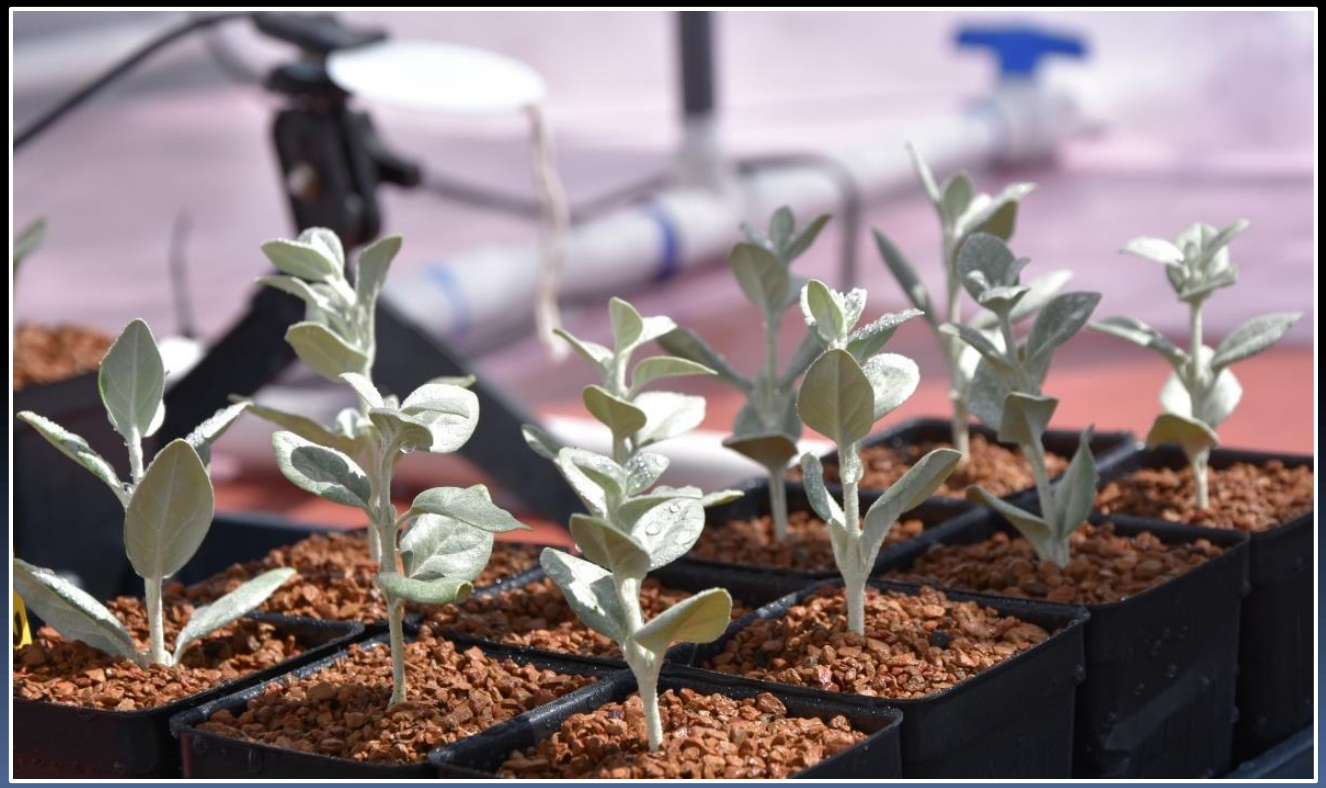
- Used to monitor conditions relative to foliar disease
- Can be used to predict when to spray crops
- Tested as mist controller in potted floral crop propagation
  - Allison Justice, Jeremy Crook, and Jim Faust – Clemson University

Mist Control Options

- Can target specific moisture levels on leaves
- Mist duration can be based on time or sensor surface moisture depth
- Misting interval can be based on time or leaf surface moisture depth
- Allows recording of specific misting events
- Allows real-time monitoring of mist benches via Internet

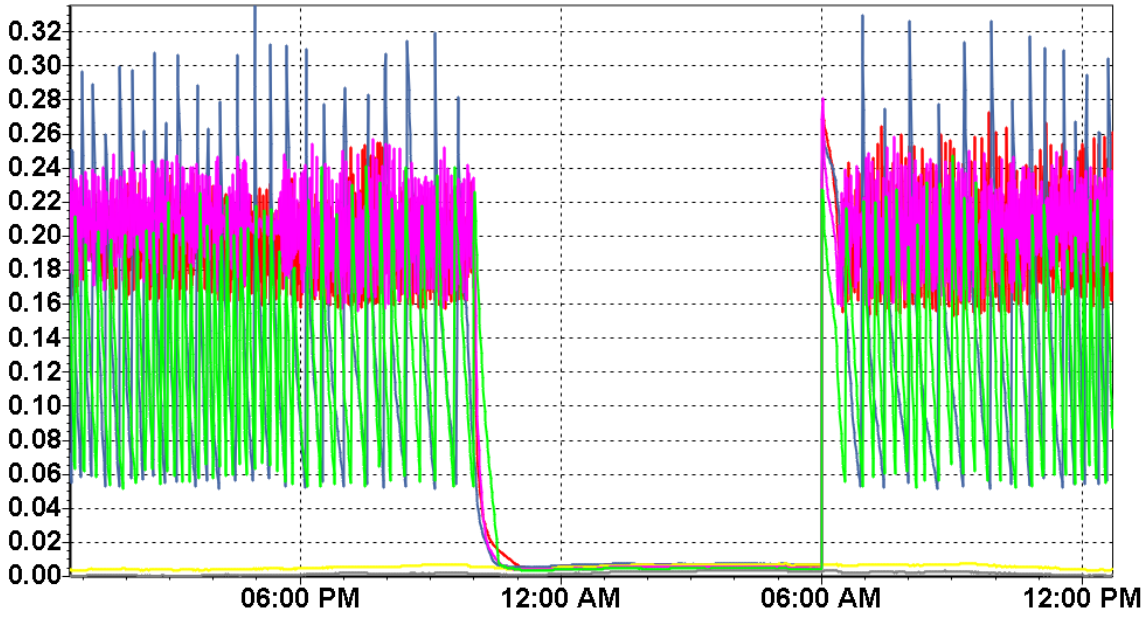
Evaluation

- Three dry-down thresholds
  - 0.05, 0.10, and 0.15 mm water
- Five-second mist duration



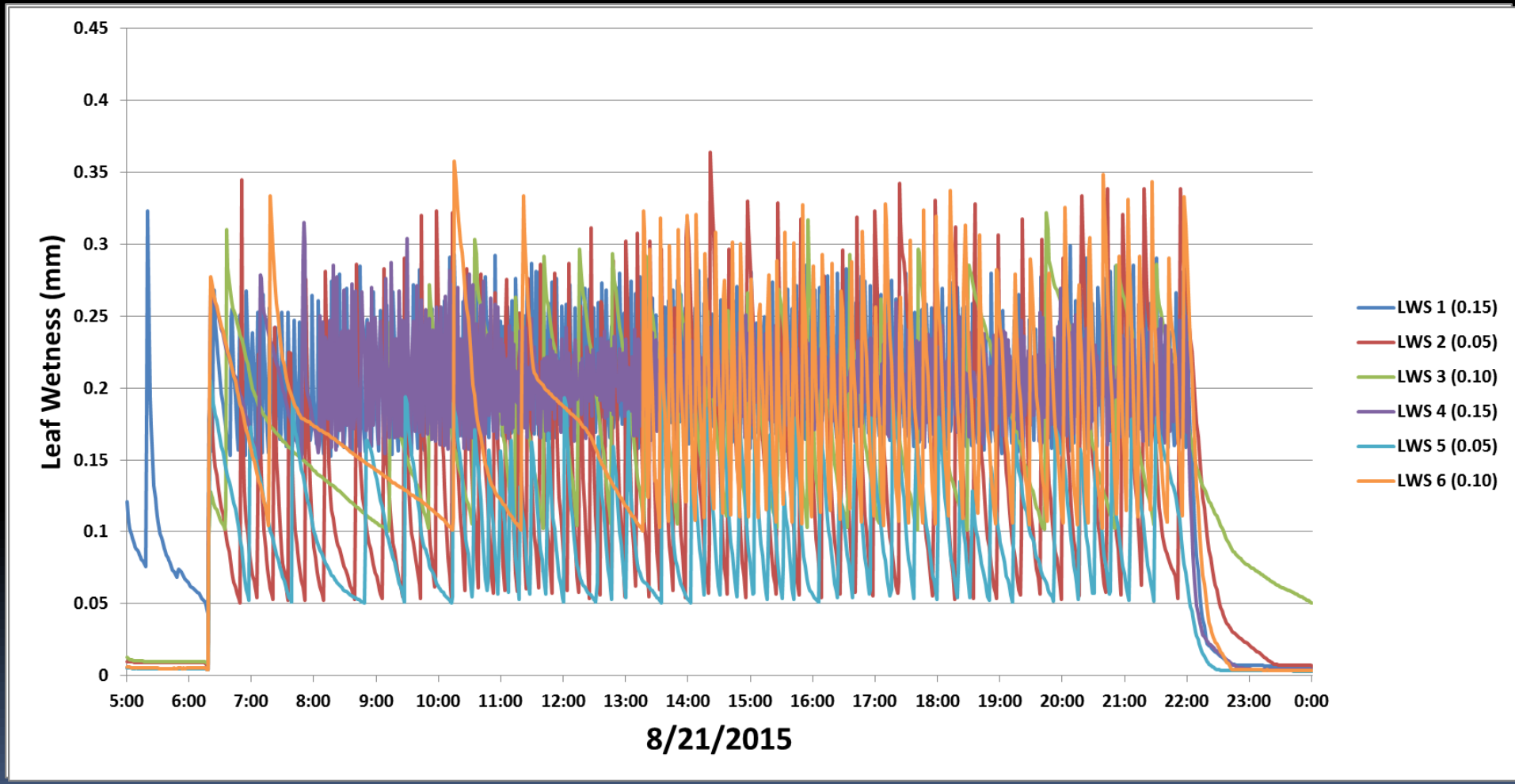
Setup

Results

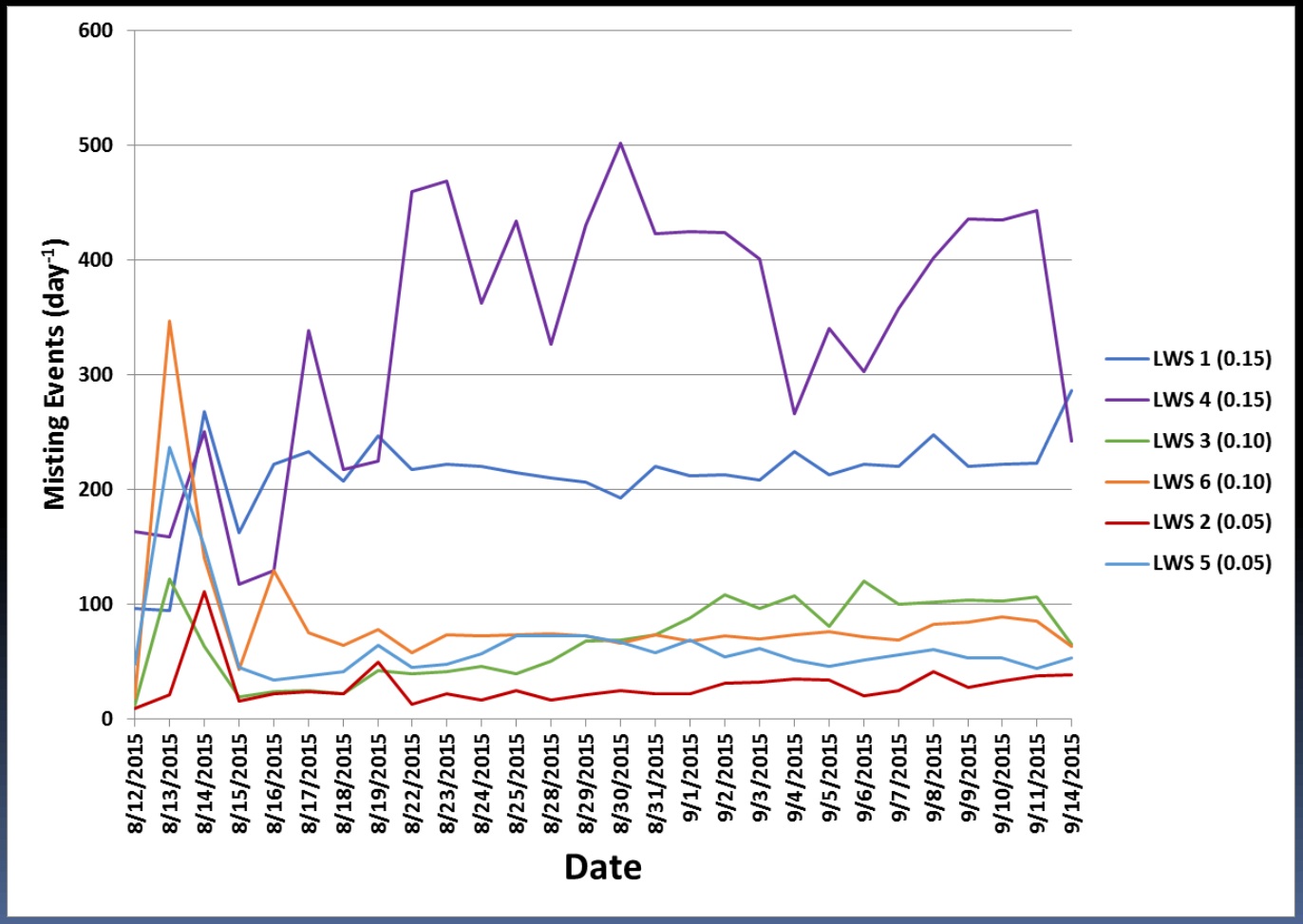


- Datalogger allows recording of mist events and remote monitoring via Internet

- Frequency of irrigation and leaf wetness can be recorded



- Some challenges with calibration to insure sensors are detecting at the same levels



Results

Plant Measurements

Treatment	Rooted	# of roots	longest root	Cutting length	Depth of cutting
0.05	83% (a)†	6.1 (a)	38.4 (ab)	115.1 (a)	40.1 (a)
0.10	85% (a)	6.9 (a)	31.6 (b)	114.5 (a)	38.8 (a)
0.15	93% (a)	7.4 (a)	44.9 (a)	114.3 (a)	39.3 (a)

† Vertical means (lower case letters) followed by the same letter within a column are not significantly different (p=0.05).

Misting Events

Treatment	Misting Events (day^{-1})
0.05	46.5 (b)†
0.10	76.6 (b)
0.15	275.6 (a)

† Vertical means (lower case letters) followed by the same letter within a column are not significantly different (p=0.05).

Potential benefits?

- Great flexibility in controlling mist
- Integrates environmental conditions
- Continuous monitoring and data collection