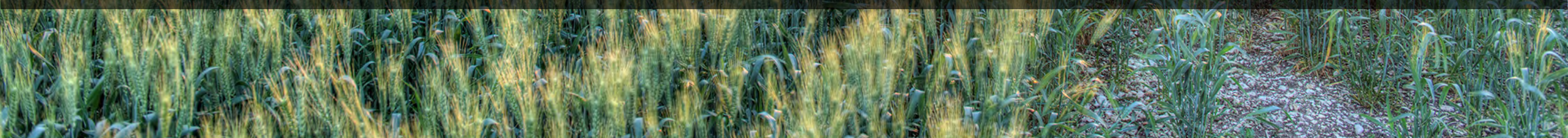




supPlant

More produce. Less water.

SupPlant, an AWL Group brand, is the world's leading provider of Growth-Based Irrigation™ technology and products.



12,000 B.C

19th Century

20th Century

21st Century

The first Agriculture revolution: first domestication of plants

The second Agriculture revolution :The mechanization of farming

The third Agriculture revolution: Science improving yields and techniques

The fourth Agriculture revolution: Automation and Precision Agriculture



The first to market closed-loop irrigation systems responsive to plant needs in real time

.....
Continuous monitoring of plant, soil and climatic data combined with advanced algorithms

.....
Bringing the Internet of Things, cloud computing, data analytics and predictive capabilities to the farm



Basic Concept

REAL-TIME CROP MONITORING

Sensors are initially installed in the field to monitor the crops and the environment

Real-time measurements from the sensors are wirelessly transmitted over the internet

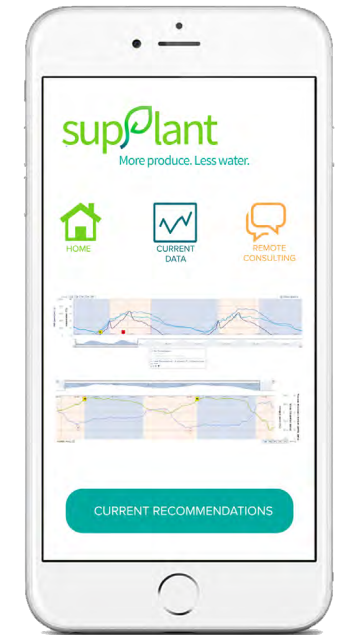
DATA STORAGE & DISPLAY

The measurements are stored securely in the SupPlant server in the cloud and are always available to download or view through a desktop, tablet or Smartphone connection

ANALYSIS & PREDICTIONS

Advanced and unique algorithms and models analyze the sensor data. It can detect water deficit, plant stress, changes in growth rate and disease conditions

Big Data analytics through the data collected



ALERTS, INSTRUCTIONS & SMART IRRIGATION

Alerts, notifications recommendations & preventive maintenance steps

The data collected is sent to an irrigation controller through the cloud and continuously defines the irrigation regime in real time



Services



Alerts & Notifications

1. Online charts and reports
2. Updates and need-to-know information
3. Stress detection
4. Water consumption calculations
5. Recommendations



Irrigation Services

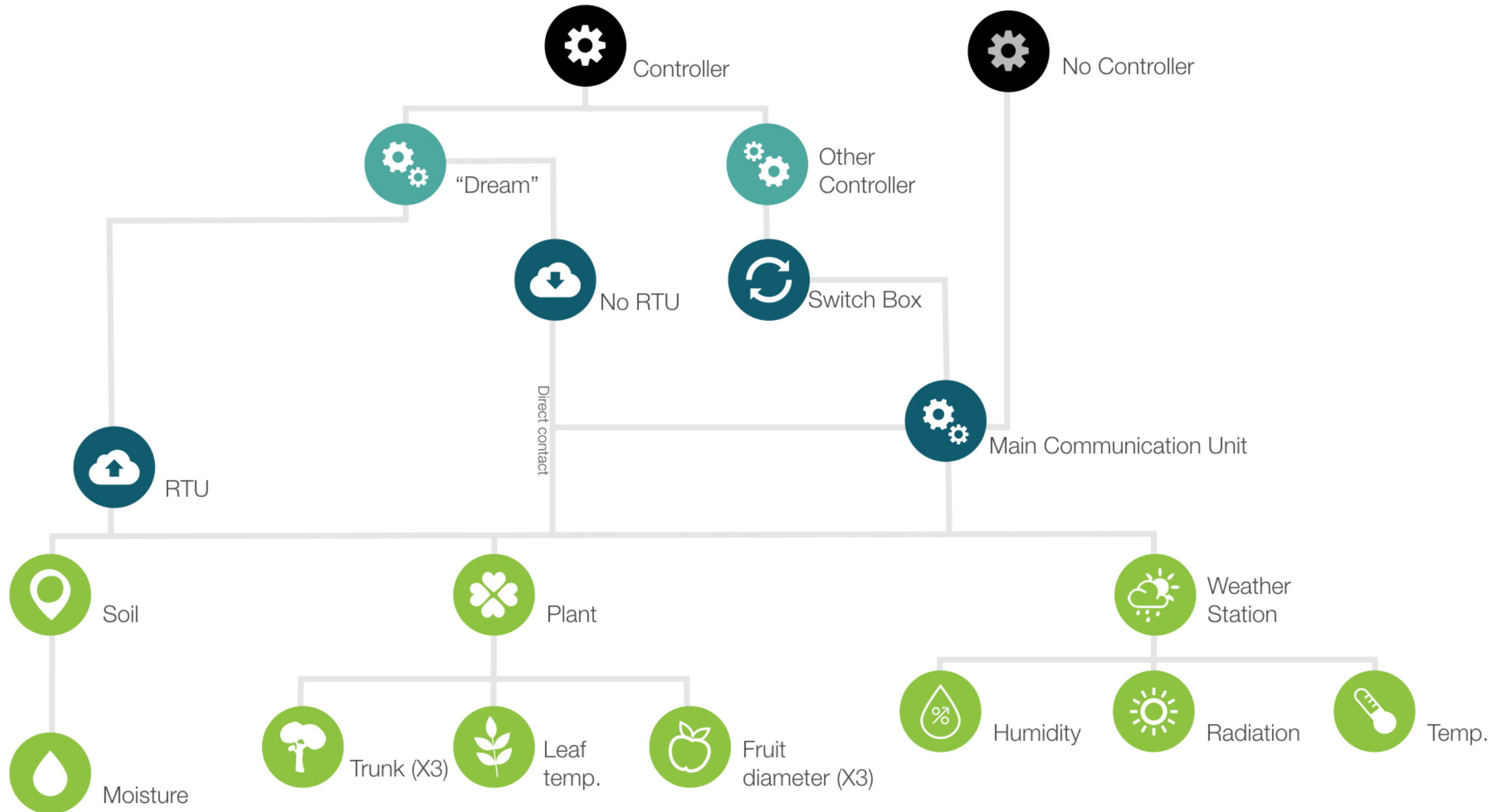
1. All AWL Basic services
2. Growth-Based Irrigation



Remote Consultancy

1. All AWL Basic or GBI services
2. Continuous agronomic guidance
3. Agronomic diagnosis & reports

Hardware Configuration



GBI: Growth-Based Irrigation



Variables that effect crop water consumption

- » Air Temp
- » Wind Speed
- » Wind Direction
- » RH
- » Root System Development
- » Leaf Area Index
- » Soil Salinity
- » Ground Water
- » Soil Moisture
- » Soil Structure

Due to the vast number of variables it is almost impossible to create a sufficient model that provides good prediction to the crop water uptake.

SupPlant's GBI: new technology that continuously monitors crop growth using sensors and other means, sends the Data to the internet where unique algorithms are calculating the water effect on growth and send updates to an irrigation controller in terms of when and how much water to be provide.



Sensor Overview

Weather

Leaf

Soil

Growth

Weather Sensors

1. Solar Radiation
2. Wind
3. Air Temperature
4. Rain
5. Humidity

Provides an estimate of the total plant water usage – Daily Potential Evapotranspiration (ETP) and Environmental Stress.

Vapor Pressure Deficit (VPD). Can predict daily water needs.



Leaf Sensors

1. Leaf Temp Clips
2. Canopy IR Camera

Provides information of the Stomata opening and Crop Water Stress Index (CWSI).

Accumulated Stress indicates a need to change the irrigation quantity and schedule.



Soil Sensors

1. Soil Moisture
2. Soil Temperature
3. Tensiometer
4. EC

Minimum Soil Moisture levels can be set based on the soil type. Setpoints can be adjusted based on stress indicators, salinity and nutrition.

Changes in soil moisture over time are useful in defining the soil properties and setting minimum irrigation frequencies.



Growth Sensors

1. Stem Diameter
2. Fruit Diameter
3. Dendrometer

Changes in growth rate are continuously monitored and can detect stress immediately.

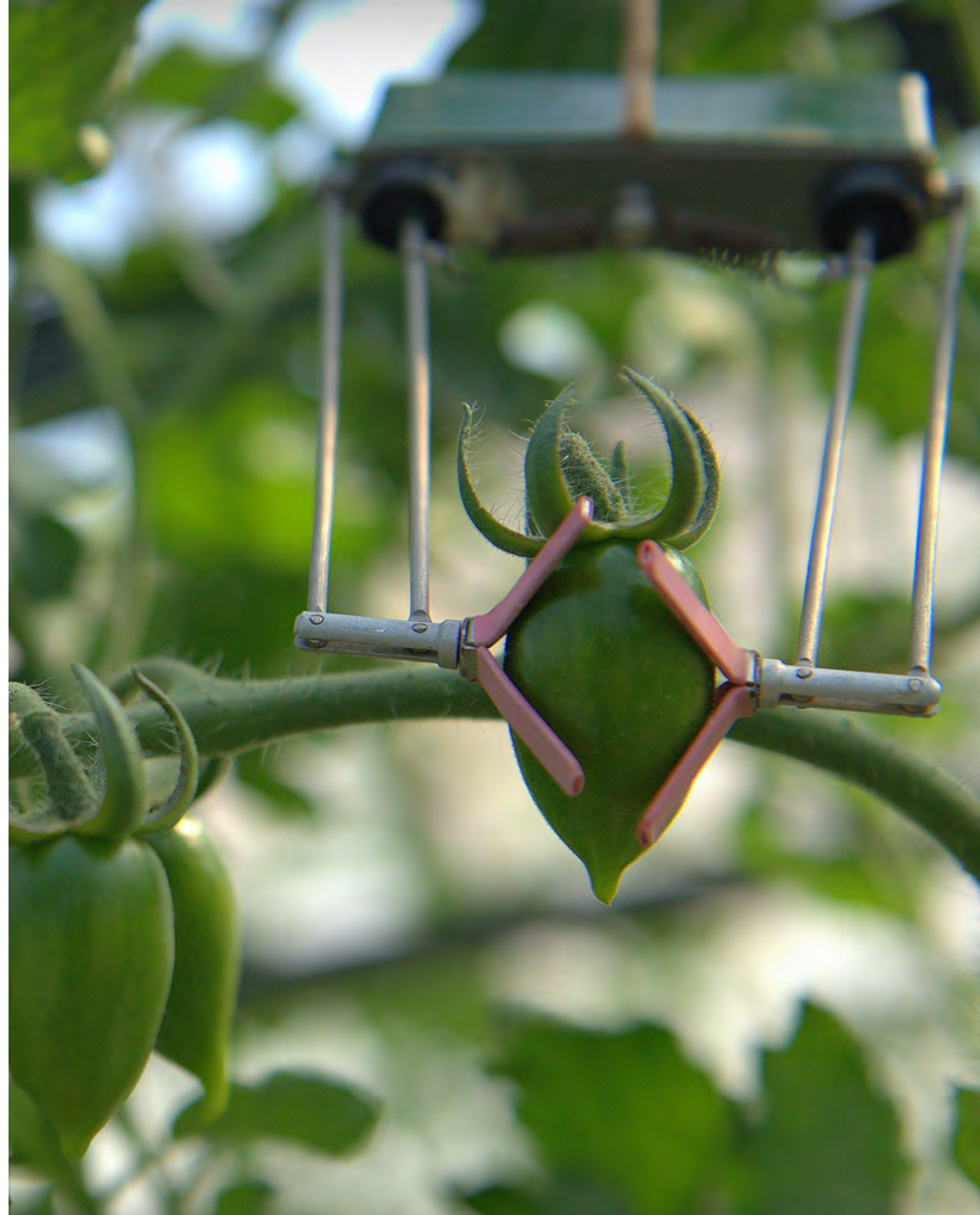
Stem growth and contractions relative to the weather conditions indicate water shortage.

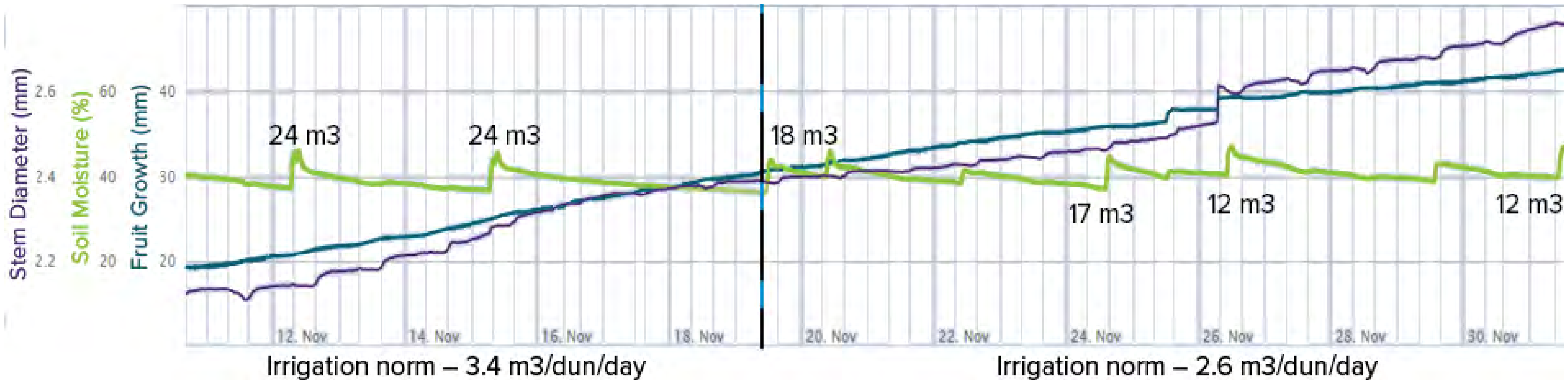


Latest Results



Tomatoes - Fall 2015

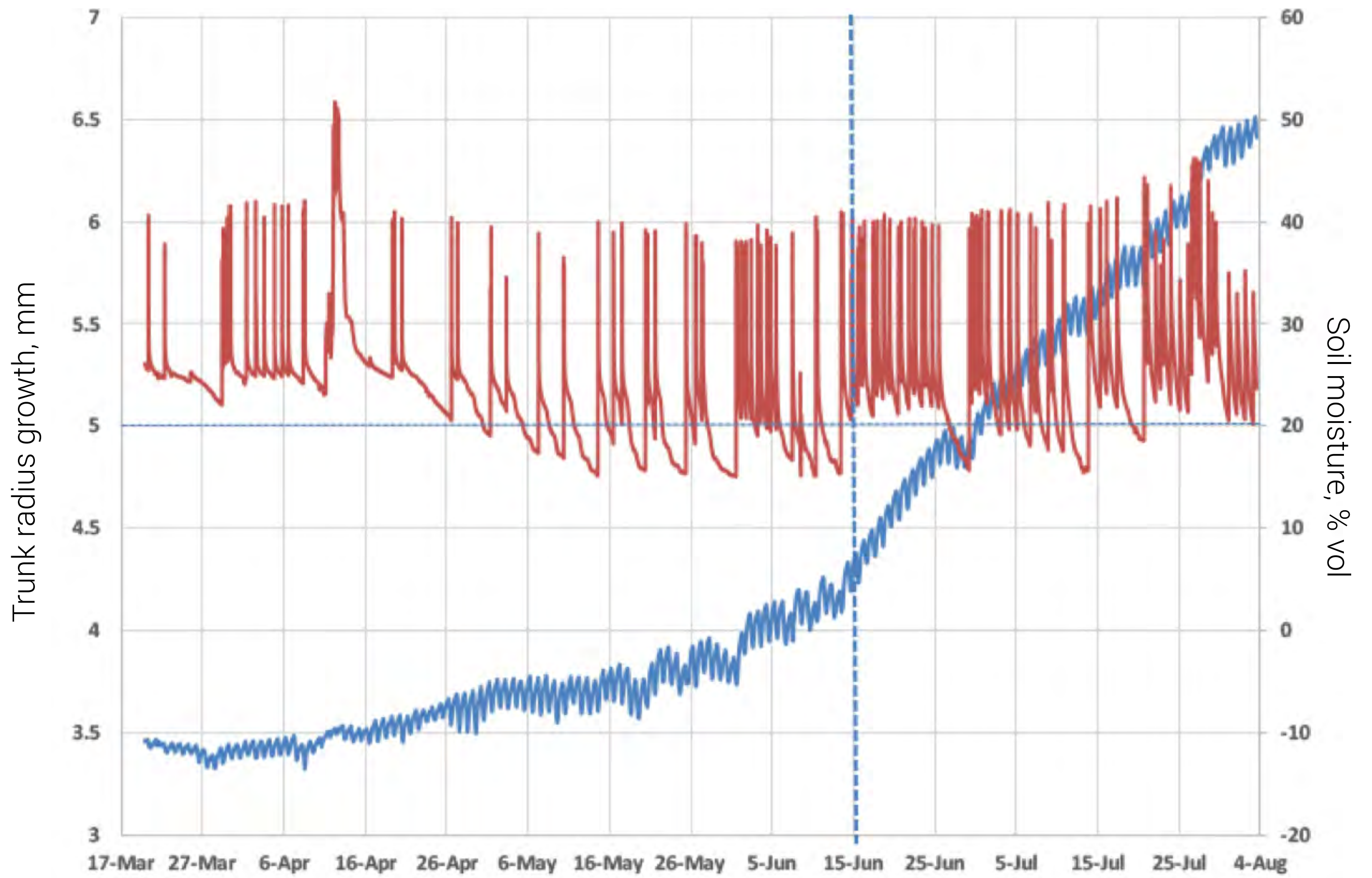




Increased fruit and stem diameter growth rate
 Saving 25% irrigation water and fertilizer

Grapefruit - Spring 2015





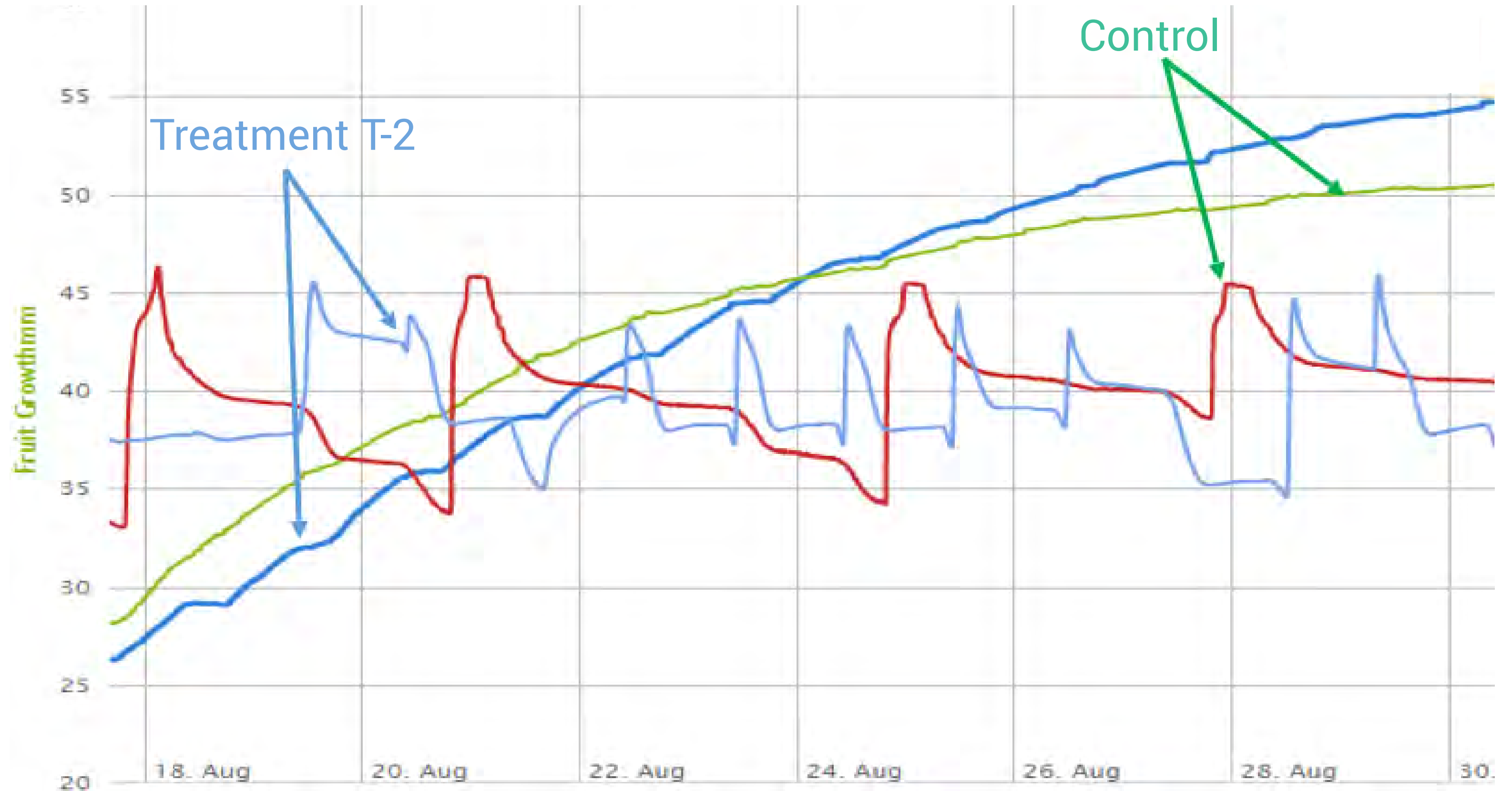
SupPlant Growth-Based Irrigation (15.6.2015 and forward) compared with average standard irrigation (until 15.6.2015):

Up to 166% increase in growth rate

Corn - Summer 2015



Cob growth rate with automatic and recommended irrigation



Irrigation norm and cob growth rate

T-2 (automatic irrigation)

Irrigation: 5.02 m³ per dun

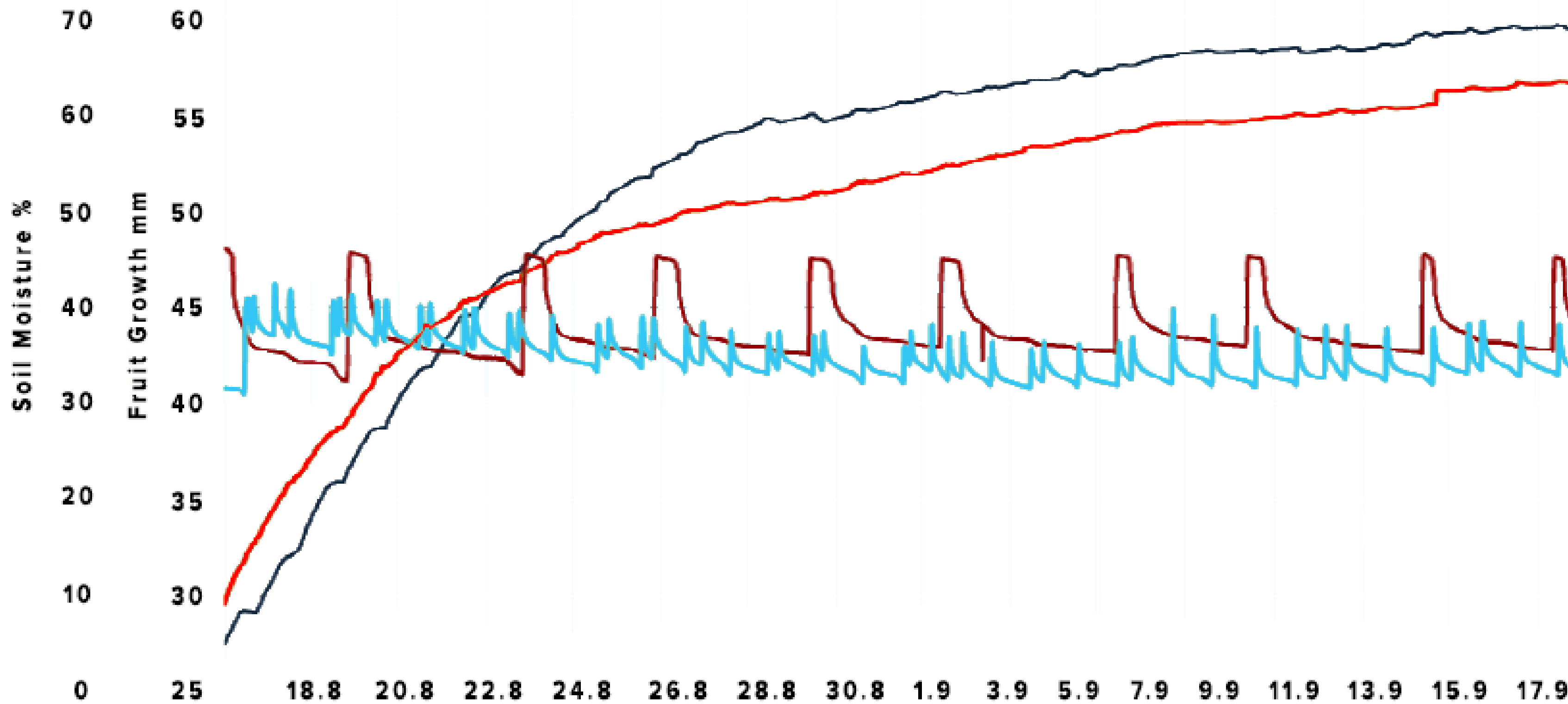
Cob growth rate: 2.17 mm per day

Control (recommendation)

Irrigation: 7.80 m³ per dun

Cob growth rate: 1.73 mm per day

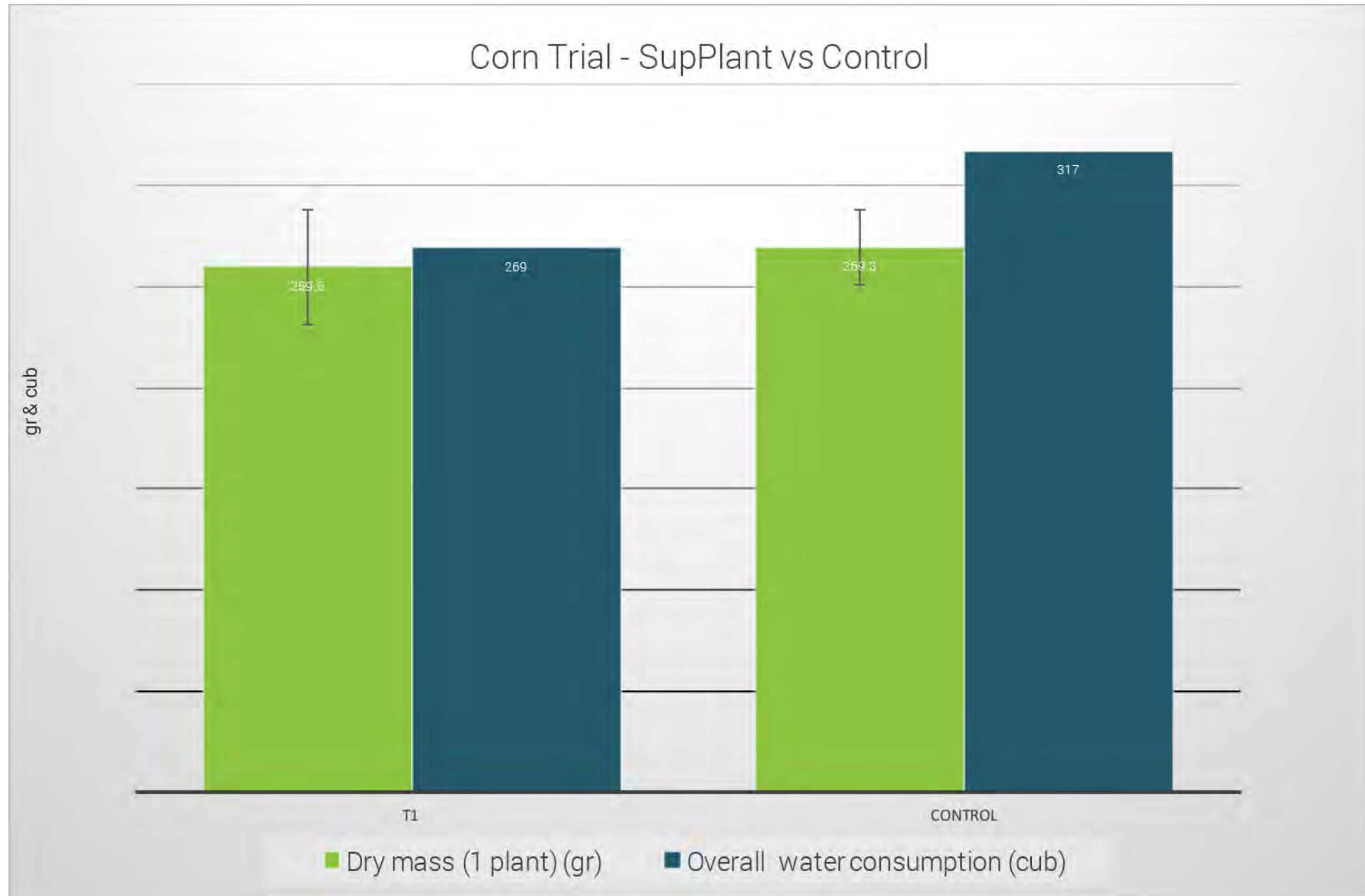
Irrigation Regime Example



Irrigation norm: T-2 – 130 m³/dun; Control – 195 m³/d

Regular recommended irrigation norm: growth rate vs AWL Smart Irrigation: Growth rate

Final Statistic Results



SupPlant Growth-Based Irrigation trial statistic
final results (Summer 2015) in corn:

15% water savings with same amount of yield



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THANK YOU

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