

Orientation to the Deep Root Irrigation Program
Procedures and Evidence For Adoption

info@deeprootdistribution.com

<http://deeprootdistribution.com>

The Farmers Challenges

Water	Cost of water	Cost of Energy to Move water	Cost of Fertilizer
Weed Abatement and Cost	Efficient Nutrient Management	Salinity	Cost of Topical and Subsurface Soil Amendments
Clogged Emitters	Fungus and Cost to Abate	Regulatory Environment and its Cost	Social and Political pressures related to use of chemicals
Pressure from Environmental Groups			

Solution DRI

What are the Benefits and Advantages of DRI's Targeted Delivery?

- DRI cuts water use by 60 %
- DRI cuts cost of water use by as much.
- DRI cuts cost of energy to use water by as much
- DRI delivers nutrients directly to the root zone.
- DRI reduces weed abatement costs.
- DRI provides a more efficient means of nutrient management
- DRI reduces levels of salinity at the root zone
- DRI reduces and can eliminate the need for topical soil amendment
- DRI eliminates the evaporation that causes the mineralization that clogs emitters
- DRI reduces the need for and cost of using fungicides
- DRI reduces the need for and cost of pest control
- DRI reduces the costs of non-compliance with government regulations.
- DRI Makes it more difficult for environmental groups to make a case against the farmer.

SIMPLE STEPS

1. **INSTALLATION:** Installation must be done according to manufacturer's specifications. Training and supervision of installation is provided
2. **IMPLEMENTATION:** This refers to manufacturer's specs and procedures and the 10 highest priority considerations for installing DRI. **THESE ARE 10 RULES THAT ARE NOT OPTIONAL** and every grower must follow to ensure success with DRI.
3. **DIAL IN:** The dial in is a process by which the DRD field Rep works within the context of the customer's unique situation: soil type, plant type, hillside farming, etc.
4. **MONITORING:** The importance especially, of subsurface monitoring to this program is critical for building the customer's confidence in DRI performance and is a necessary tool for knowing when to irrigate and when not to irrigate with DRI. All means of monitoring are absolutely imperative to data gathering.

THE 10 RULES (Implementation)
<ol style="list-style-type: none"> 1. Always confirm successful flow of water through emitters and DRI unit before burying the device in the ground 2. Properly vent all drip hose lines with auto flush valves to eliminate air blockage in the DRI unit. 3. Properly bury DRI unit so 3 inches of spaghetti hose is buried to ensure protection of unit from the elements. 4. Tamp soil around spaghetti hose where the unit enters the ground. 5. DRI unit must be installed in close proximity to the root zone. 6. DRI unit must be installed uphill of the plant in hilly situations. 7. The DRI unit must not be exposed to sunlight for any significant period of time. 8. Subsurface monitoring is absolutely necessary for a meaningful use of DRI. 9. DRI must be isolated from open emitters to perform optimally. 10. A Deep Root Distribution Rep must be allowed to work routinely with the customer to ensure the customers growing confidence and success with DRI.



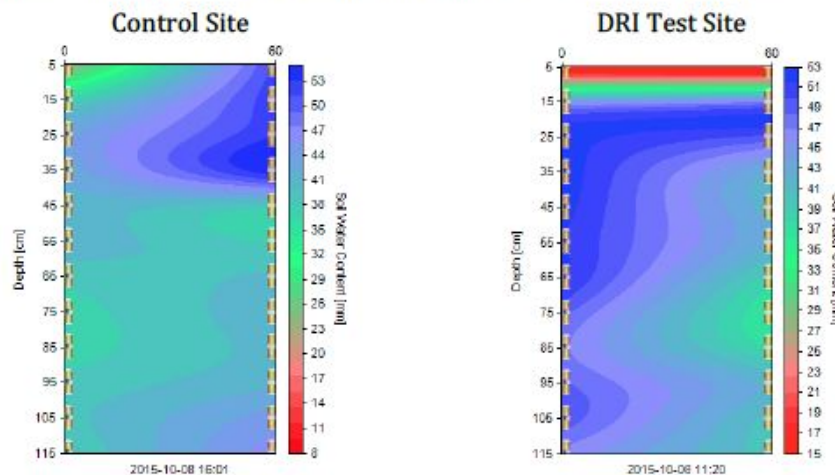
Deep Root Irrigation Trial

Circle K Ranch

Professional Grower Services, LLC installed a test site at Circle K ranch in Elk Grove California.

The trial site monitors soil moisture (soil water content) at a Deep Root Irrigation equipment site and the current irrigation system site in the same vineyard location. PGS installed two test sites. Each site has Sentek Drill and Drop soil moisture probes approximately 30cm apart down to 120cm with a soil moisture sensor at every 10cm for a total of 12 soil moisture sensors. The data is viewed with Sentek's IrriMAX Live web-based software and provides a two dimensional view of both lateral water movement through the soil as well as the vertical movement through the soil.

The trial demonstrated that the DRI test site reached a soil saturation of over 50% soil water content in 4.5 hours versus the Control Test site in 9.0 hours.



Using onsite flow meters, the DRI site demonstrated a savings of 4.54 gallons of applied water to reach a similar saturation point as in the drip control site per vine. The applied water at the DRI site was 2.84 gallons per vine, compared to 7.38 gallons per vine in the drip control site.

Test results will vary depending on site soil type and current irrigation methods.

Jack Coots
President
Professional Grower Services, LLC
www.progrowerservices.com
jack@progrowerservices.com

Coastal Viticultural Consultants Test

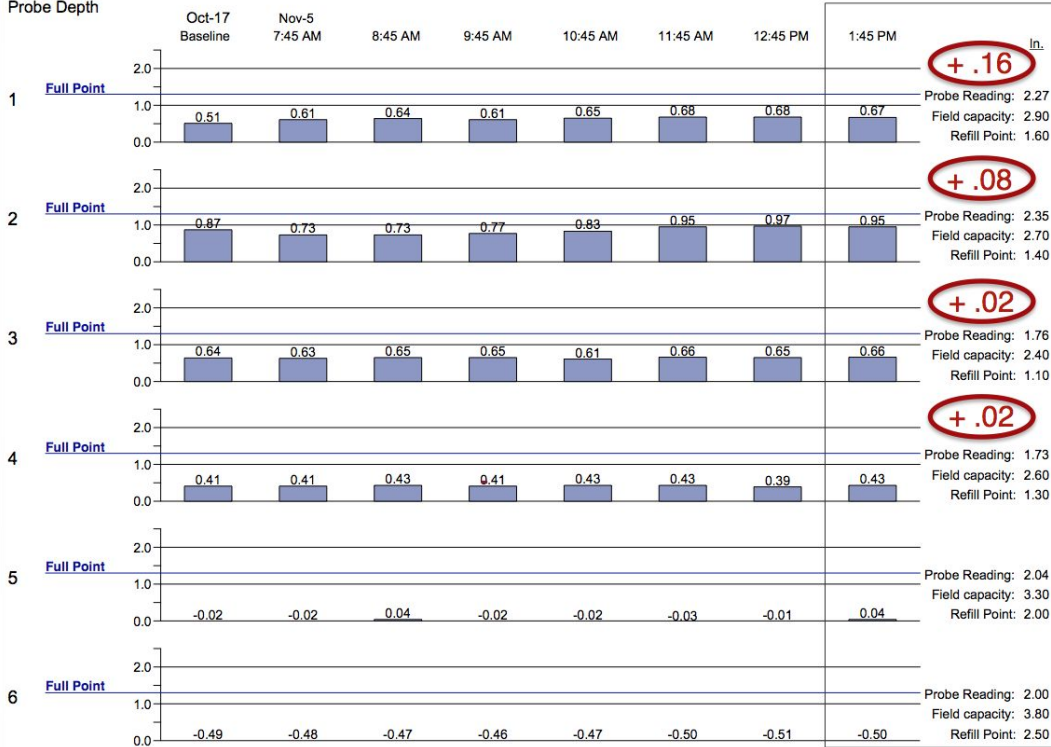


Standard Drip Emitters /

100-07

Profile Chart

Probe Depth



Variety: Cabernet Sauvignon
Rootstock: 101-14

Plant Spacing: 4 Ft.
Row Spacing: 6 Ft.
Active Root Zone: 5 Ft.

Shoot Length: In.
Last Week: In.
Change: 0 In.

Stress Index: 0
Bloom: %
Veraison: %

Weekly ET: 0.51 In.
Average Daily ET: 0.07 In.

Total Available Water In Active Root Zone: 2.75 *
Last Week: 2.68
Change: 0.07

Suggested Application: 4.7	
Gallons Per Vine/Week	
75%	3.5
50%	2.4
70%	3.3
33%	1.6
60%	2.8
25%	1.2
Crop Factor: 0.5	

Comments:

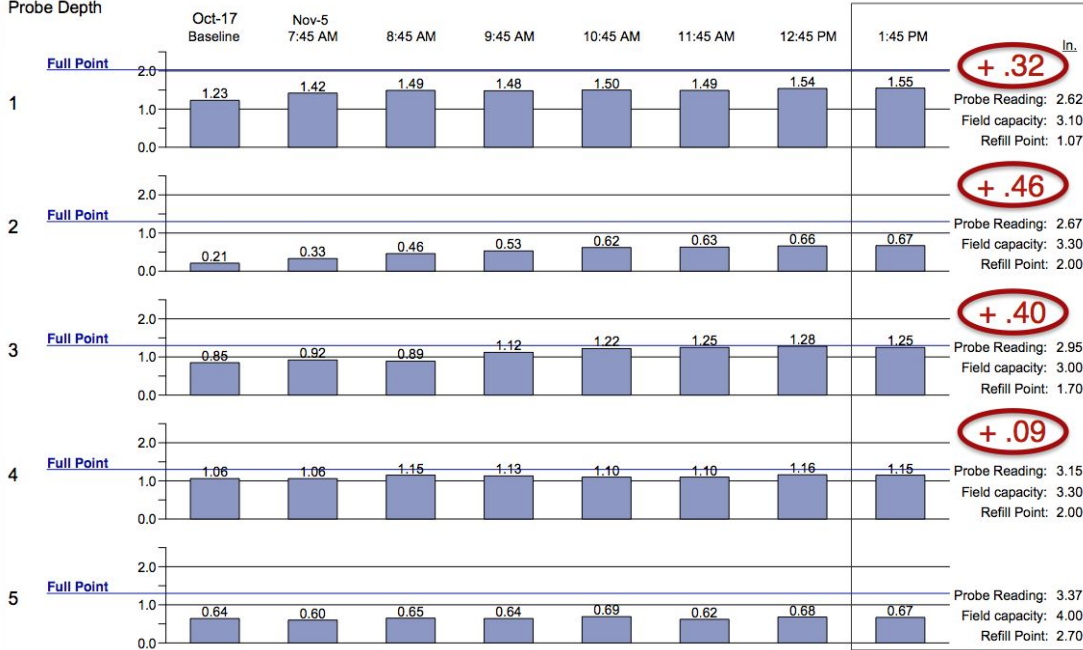


Deep Root Irrigation /

101-08

Profile Chart

Probe Depth



Variety: Cabernet Sauvignon
Rootstock: 101-14

Plant Spacing: 4 Ft.
Row Spacing: 6 Ft.
Active Root Zone: 5 Ft.

Shoot Length: In.
Last Week: In.
Change: 0 In.

Stress Index: 0
Bloom: %
Veraison: %
Weekly ET: 0.51 In.
Average Daily ET: 0.07 In.

Total Available Water In Active Root Zone: **5.29***
Last Week: 5.32
Change: -0.03

Suggested Application: 4.7 Gallons Per Vine/Week			
75%	3.5	50%	2.4
70%	3.3	33%	1.6
60%	2.8	25%	1.2
Crop Factor: 0.5			

Comments:

Table Grape Vineyards in Bakersfield

Table Grape Soil Moisture Content taken with Aqua Tier M350 Tensiometer

24 hours after an irrigation cycle

Date: 6/4/17

Starts: 6 inches 12 inches 22 inches

DRI #1 58 85 96

DRI #2 63 82 89

drip #1 62 65 7

drip #2 83 69 16

3 yr. Mature 6 inches 12 inches 22 inches

DRI #1 85 113 59

DRI #2 69 99 75

drip #1 79 65 Hard pan, no reading

drip #2 81 62 38 at only 18 inches

Date: 6/27/17

Starts: 6 inches 12 inches 22 inches

DRI #1 60 85 97

DRI #2 63 87 96__

drip #1 67 66 17__

drip #2 83 73 20

3 yr. Mature 6 inches 12 inches 22 inches

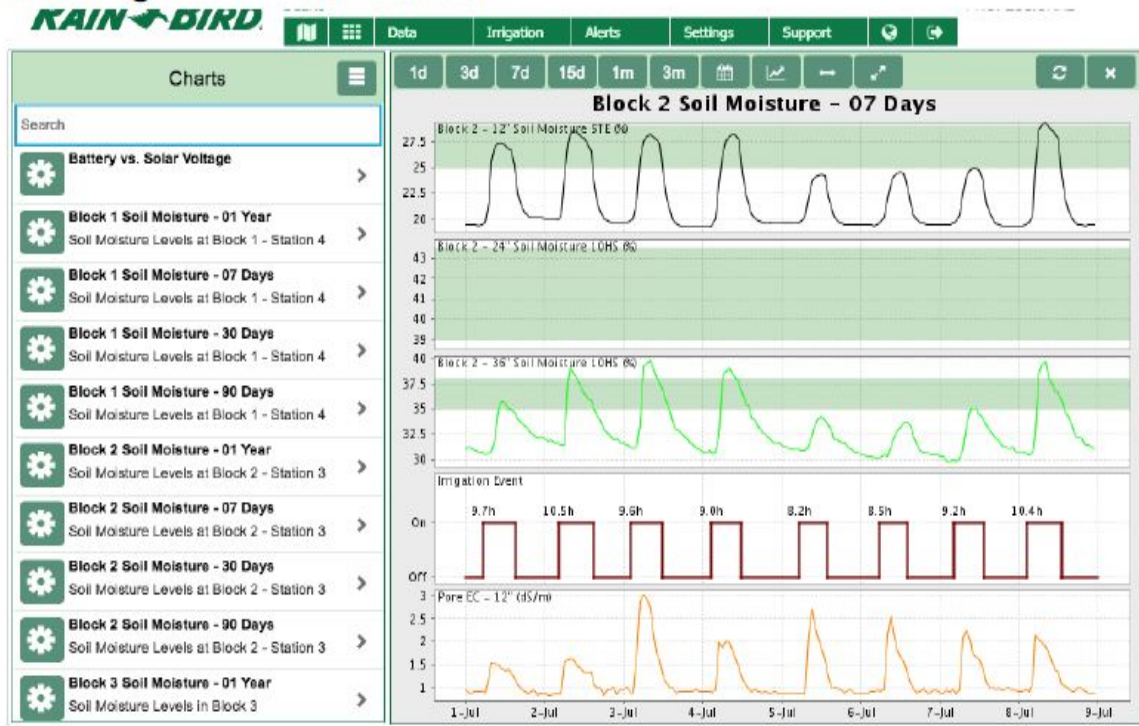
DRI #1 90 91 112

DRI #2 88 88 110

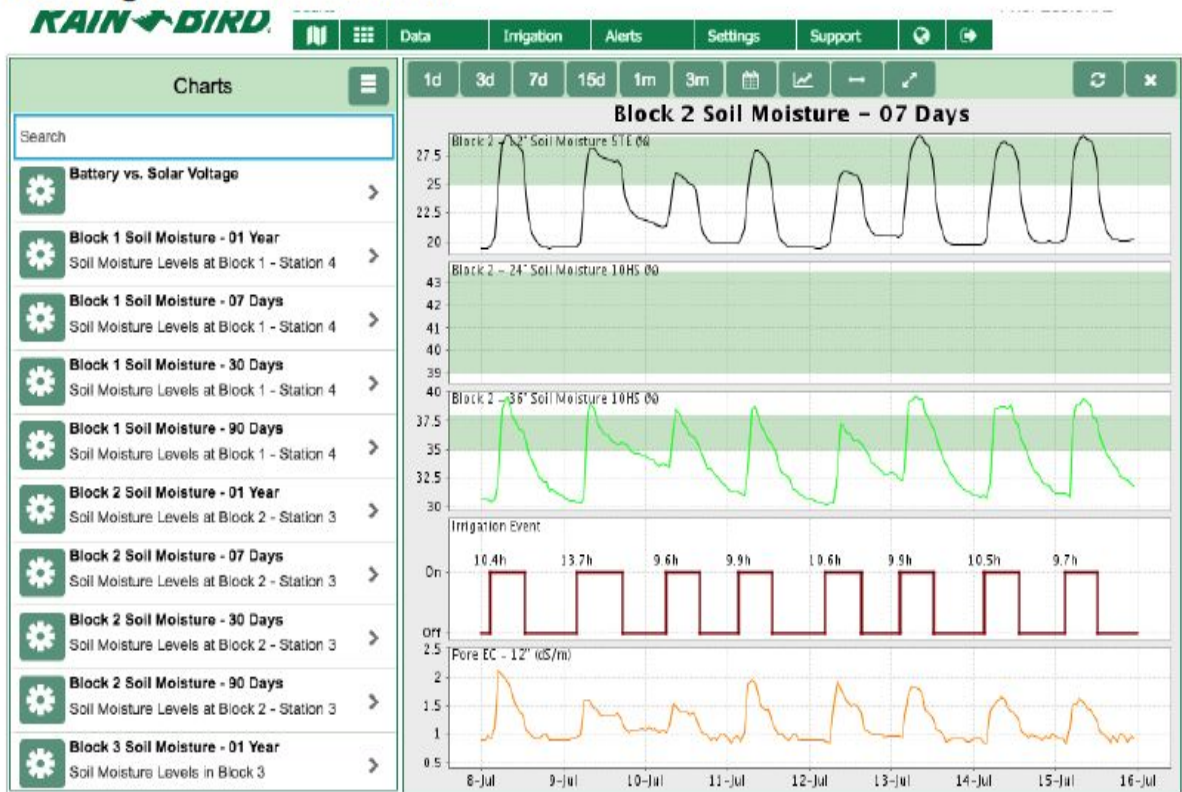
drip #1 93 96 41

drip #2 89 87 32

Readings before vent added



Readings after vent added





Prune tree irrigated with **DRI** (no weeds)
Planted 1 yr. ago at 30 inches



Prune tree irrigated with surface flood
Planted 1 yr. ago at 30 inches

