

CASE STUDY

Dry On Vine (DOV) Raisin Vineyard

Enhanced soil and plant health

Independent Study by: Jerry Rai, Aqua-PhyD, Inc.
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Location: Firebaugh, CA
Start Date: June, 2007
End Date: September, 2007

STUDY

To determine the effectiveness of the Aqua-PhyD system technology to reduce salinity and sodicity in the soil, enhance plant growth, and enhance plant health.

PROBLEM

Customer was losing vines due to heavy salinity and sodicity in both water and soil. Deficiencies caused loss of production and yield.

PROPOSED SOLUTION

Use Aqua-PhyD water and soil treatment technology to reduce soluble salts and sodium without use of chemicals or other physical intervention.

OBJECTIVE of the Case Study

To evaluate the effectiveness of the Aqua-PhyD technology on high saline and sodic soils and water on farms that produce grapes for DOV raisins.

TECHNICAL SETUP

The test site is in Firebaugh, California. The vineyard is 10 years in age and is on a major farm in the area. The Aqua-PhyD system was installed on two 75 acre plots (#25 and #26). The local soil was a sandy loam (#25: 51.2% sand, 36% Silt, 12.8% clay - #26: 53.2% Sand, 36% Silt, 10.8% Clay). Watering was applied by drip irrigation.



The Aqua-PhyD unit was installed into the main irrigation system of the vineyard.

At the time of installation, soil samples were taken from both test plots (#25 and #26) during June, 2007 and sent to AgSource, Harris Laboratories in Lincoln, NE for analysis. After 90 days of irrigation (at the time of harvest) soil samples were taken again in September, 2007.

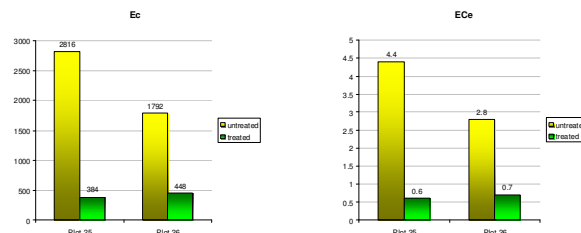
OBSERVATIONS

Recorded by Administrator during the 3rd month of the test period

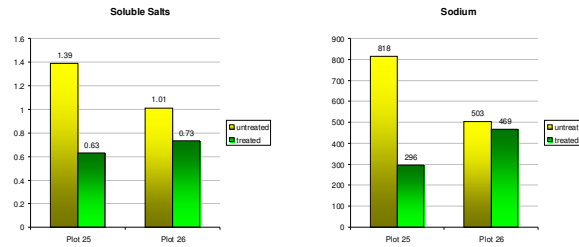
■ Soil Analysis

Based on soil comparisons between plots 25 and 26 before and after irrigations with Aqua-PhyD, the following observations were made:

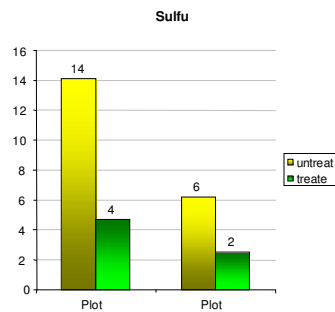
- Major reduction in Ec and ECe



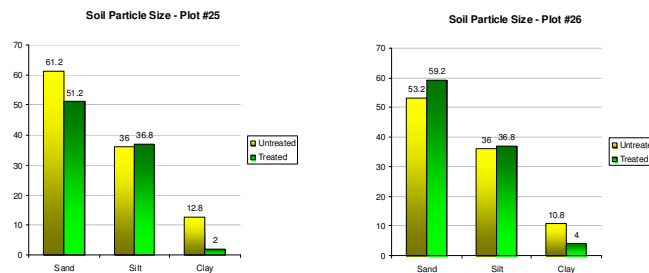
- A significant reduction in Soluble Salts and Sodium on both 25 and 26 due to improved water movement. This will also have a positive impact on soil tilth, plant health and availability of essential nutrients.



- Reduction of sulfur indicates significantly improved water movement in the soil



- Soil particle analysis revealed a reduction in clay content in both plots as illustrated in the graphs below



- Major reduction in total N due to reduced inputs and more efficient water movement

CONCLUSIONS

- Aqua-PhyD treated plots achieved improved water penetration which enabled the soil and vines to efficiently receive moisture.
- Salinity in the soil was reduced
- Treated canes had vigorous growth for the future crop year, unlike stunted growth from the heavy production of the previous year.
- Particle size analysis illustrates improvement in soil structure reducing clay while increasing sand content. This indicates aggregation of soil which further enhances water infiltration and percolation. By extension this indicated improvement of soil O₂ content and gas exchange capabilities.
- Future testing needs to include evaluation of chloride and bicarbonate
- Treated plots produced more yield

OWNER COMMENTS

Owner of Raisin Vineyard

“Not only did I have a higher yield, but also a better growth of canes for the upcoming year.”

“My main objective is to save my vines and decrease salts in my soil.”

ADMINISTRATORS

Jerry Rai – Director, Agriculture - Aqua-PhyD, Inc.

Brad Snavely – Director of Agronomic Services, Aqua-PhyD, Inc.