

Selecting and Managing Vineyard Cover Crops to Reduce Net Consumption of Basin Water

Cover Crop Species Experiment

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Declines in the Paso Robles Groundwater Basin and several years with very little rain have increased awareness of water conservation practices in vineyards. Cover crops can improve water infiltration from precipitation while also preventing erosion and building organic matter in soil. However, the cost of those cover crops in terms of water use is not well understood on the Central Coast. In 2014 grant funding from Western Sustainable Agriculture Research and Education (Western SARE) was awarded to the Vineyard Team for a 2-year study to evaluate cover crop species to reduce net water consumption.

The Experiment

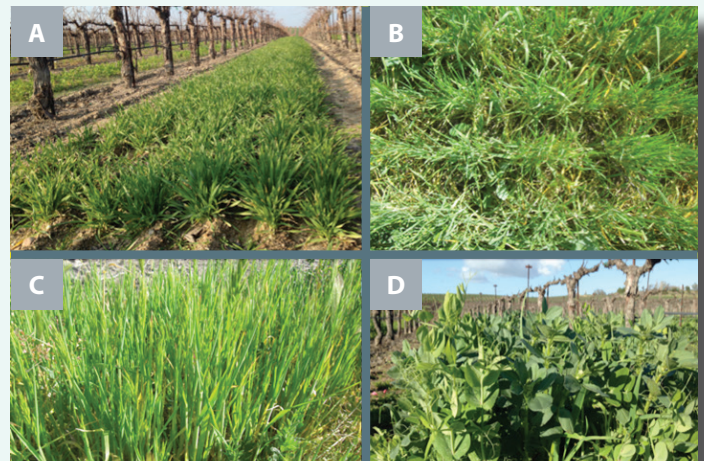
EXPERIMENT 1
Cover Crop Comparison
Clean cultivation
Barley (UC 937)
Medic (Paraggio)
Triticale (Trios 888)
Brome (Blando)
Peas (Dundale)

This experiment measured the effects of five (5) different species of cover crops (plus a clean cultivation control) on soil moisture depletion. The experiment was repeated at two sites on the east side of Paso Robles, with randomized complete block designs with three replications.

Methods and Materials

Cover crops were planted in November of 2014 and 2015. Helena Chemical Company donated the seed, the labor, and the expertise for planting the cover crops in both 2014 and

2015. In late April of 2015 and May of 2016 soil samples were collected from 18" and 36" in the experimental plots. Plant material was also collected to see if there were differences in the amount of biomass produced by the species of the cover crop. Both years the soil and plant samples were processed at Cal Poly San Luis Obispo. The gravimetric soil moisture content and the dry matter biomass of the samples were collected for analysis. Pruning weights were taken in January in each experimental plot to determine the treatment effect on vine growth during the 2015 season. Treatment effects were assessed by ANOVA at the 5% significance level. Each site (vineyard) was a complete experimental design to itself which allowed comparisons to be made between sites.



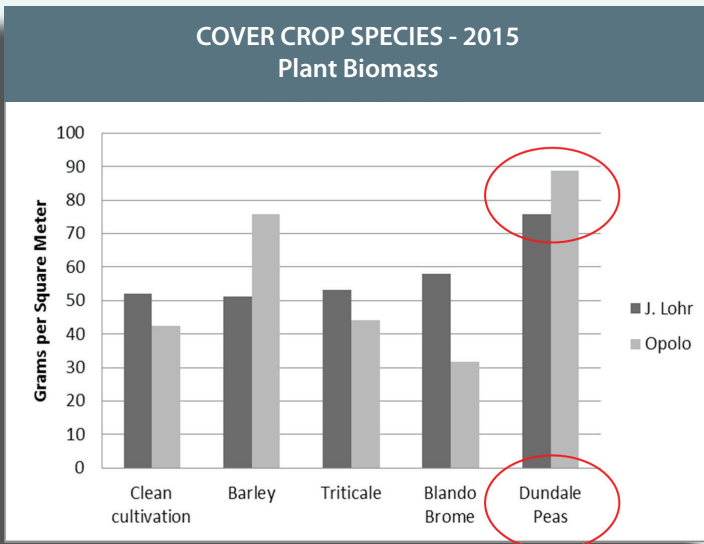
Cover crop varieties evaluated at 3 vineyard sites in Paso Robles area: A) Triticale "Trios" B) Brome "Blando" C) Barley "UC937" D) Field Pea. Clean cultivation not shown.

Results

Results showed no significant differences in the depletion of soil moisture by the species and varieties of cover crops in this experiment compared to the control or compared to each other. This was true of both sites in the project in both years.

Pruning weights showed that the different experimental treatments did not produce differences in vine growth during the 2015 season at either of the sites.

Dundale pea produced significantly more plant biomass at both sites in Year 1, but not in Year 2.



design, the species of cover crop in a vineyard middle during the winter and spring months does not have an impact on soil moisture depletion and, therefore, does not increase the necessary quantity of water that must be supplied to vines through irrigation.

One factor which could have affected this experiment is the lack of rainfall during the winter of 2014- 2015 and again during the winter of 2015-2016. If more water had been available during the growth of these cover crops, differences between the treatments might have been observed. Additional data must be collected in seasons with higher rainfall to determine if seasonal rainfall is a factor.

This project was funded by a grant from Western SARE.

Discussion

The species or type of cover crop in a vineyard does not appear to affect soil moisture depletion. This is interesting given the variety of species included in the experiment. Grasses and legumes are very different types of plants with different rooting patterns, etc. One would expect some difference in soil moisture depletion between types. This was not the case. As far as can be measured by this set of experiments with this



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www.vineyardteam.org