Effect of Living or Straw Mulch on Weed Management and Soil Quality in Grape Vineyards

Investigators:

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Supported by a grant from the Leopold Center for Sustainable Agriculture.
Sustainable Weed Management to Improve Soil Quality in Midwest Viticulture

Herbicide

Living mulch (fescue)

Straw mulch

Cultivation
Soil Quality 2006 - YIELD in Mature ‘Foch’ Vineyard (ISU)

No differences:
- Grape yield/vine
- Cluster number/vine
- Cluster weight
Weed Pressure in Mature ‘Foch’ Vineyard (ISU)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>May</th>
<th>July</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living mulch</td>
<td>2.7 b c</td>
<td>3.1 b</td>
<td>4.7 c</td>
</tr>
<tr>
<td>Straw mulch</td>
<td>1.7 c</td>
<td>1.5 b</td>
<td>3.9 c</td>
</tr>
<tr>
<td>Herbicide</td>
<td>17.0 b</td>
<td>64.7 a</td>
<td>20.4 b</td>
</tr>
<tr>
<td>Cultivation</td>
<td>75.8 a</td>
<td>69.8 a</td>
<td>84.0 a</td>
</tr>
<tr>
<td>lsd x</td>
<td>14.4</td>
<td>26.9</td>
<td>14.3</td>
</tr>
</tbody>
</table>

z Means of four replications.
y Means obtained from the avg. of three, 0.25m2 quadrats per plot.
x Least significant difference @ P<.05; Values with the same letter are not significantly different from each other.
NS = Not significant.
Grower Experiences with USDA/NRCS Soil Quality Test Kit

Charles Caldwell, Black Squirrel Vineyard
Paul Tabor & Brian Keehner, Tabor Home Vineyards & Winery
Craig Dilley, Graduate Student, Dr. Gail Nonnecke
What is Soil Quality?

Soil Quality refers to the ability of soil to:
- produce a crop
- store and cycle nutrients
- resist erosion & compaction

Considers:
- Soil Chemical analysis
- Soil Physical condition
- Soil Biology (e.g., microbes and worms)
Why should grape growers care about soil quality?

- Can help growers maintain soil for optimum productivity.
- Can alert growers to problems with their soil.
- Vineyard soils can be compared over time.
- Different soil management strategies can be compared.
What does the kit measure?

The field kit can be used to make 11 soil measurements:

- Electrical conductivity (EC)
- pH
- Soil nitrate
- Bulk density
- Water infiltration
- Biological properties
- Soil respiration

- Aggregate stability
- Slake test
- Earthworm test
- Physical observations and estimates
Cooperating Growers

Charles Caldwell
Black Squirrel Vineyard
Council Bluffs, IA

Paul Tabor & Brian Keehner
Tabor Home Vineyards & Winery
Baldwin, IA