

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

## *Investigators:*

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# Sustainable Weed Management to Improve Soil Quality in Midwest Viticulture



**Herbicide**



**Straw mulch**



**Living mulch (fescue)**



**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)

<b>2006</b>			
<b>Percentage weed cover <sup>y</sup></b>			
<b>Treatment <sup>z</sup></b>	<b>May</b>	<b>July</b>	<b>August</b>
<b>Living mulch</b>	<b>2.7 b c</b>	<b>3.1 b</b>	<b>4.7 c</b>
<b>Straw mulch</b>	<b>1.7 c</b>	<b>1.5 b</b>	<b>3.9 c</b>
<b>Herbicide</b>	<b>17.0 b</b>	<b>64.7 a</b>	<b>20.4 b</b>
<b>Cultivation</b>	<b>75.8 a</b>	<b>69.8 a</b>	<b>84.0 a</b>
<b>Isd <sup>x</sup></b>	<b>14.4</b>	<b>26.9</b>	<b>14.3</b>

<sup>z</sup> Means of four replications.

<sup>y</sup> Means obtained from the avg. of three, 0.25m<sup>2</sup> quadrats per plot.

<sup>x</sup> 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**

