



## Metric: Soil, Nutrient & Water Quality

### Metrics:

**1. Nitrogen applied**

$$\text{Nitrogen applied} = \frac{\text{Pounds Nitrogen Applied}}{\text{Unit of Production}}$$

**2. Phosphorous Applied**

$$\text{Phosphorous applied} = \frac{\text{Pounds Phosphorous Applied}}{\text{Unit of Production}}$$

**3. Soil Organic Matter**

$$\text{Soil Organic Matter} = \frac{\text{Soil Organic Matter}}{\text{Soil Organic Matter Potential}}$$

*Note: the Soil Organic Matter metric utilizes the Soil Organic Matter index portion of the NRCS Soil Management Assessment Framework tool to normalize the results across different soil types.*

### Data Collection:

***If you filled in the Fertilizer Use data sheet in the Air Quality and Energy Use metric, you do not need to fill in the Total N and Total P data below.***

*Please fill in the table below*

Data Item	Guidance	Unit	2009	2010	Source	Data Availability (0-4 scale)
Total N applied per unit area per time	Total lbs N applied per acre per cropping season from all N sources	Lbs				
Total P applied per unit area per unit of time	Total lbs P (not P <sub>2</sub> O <sub>5</sub> ) applied per acre per cropping season	Lbs				
Dominant soil series name	NRCS soil maps (available online) provide series names. If a field contains multiple series, choose a dominant series to use.	Series name				
Soil texture class	The appropriate class from the following list: <ul style="list-style-type: none"> <li>clay (with &gt; 60% clay)</li> <li>sandy clay, clay loam, clay, silty clay loam, silty clay, or clay (with &lt; 60% clay)</li> </ul>	Class name				



## METRIC: SOIL, NUTRIENT & WATER QUALITY

	<ul style="list-style-type: none"> <li>• silt or silt loam</li> <li>• sandy loam (with &gt; 8% clay), sandy clay loam, or loam</li> <li>• sand, loamy sand, or sandy loam (with &lt; 8% clay)</li> </ul>					
Total Organic Carbon (TOC) from soil test	<p>Follow your soil lab sampling instructions to take a sample. The lab should use the dry combustion method to determine TOC (in Western states, this may include a testing method which accounts for soil carbonates).</p>	Percent TOC				

### Additional Data Notes

#### Soil Series Names

NRCS has a very nice online tool where growers can look up soil data for their farm property including the soil series name(s). The Web Soil Survey can be found at the following location: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm> Please follow the instructions to find the dominant soil series for the pilot field/orchard/vineyard(s).

#### Soil Organic Matter

The SOM index value is calculated based on a combination of: 1) an index value determined by a given soil's inherent SOM potential; and 2) a factor that reflects positive or negative SOM change over time (5 or more years).

The NRCS Soil Management Assessment Framework (SMAF) tool SOM index is utilized for the SOM levels across fields and different production systems. The SMAF SOM index generates a score based on current SOM levels relative to a soil's SOM potential. A soil's inherent SOM potential is calculated using soil taxonomy, texture and climate.

Based on repeated SOM measurements at 5-year intervals, a factor reflecting directional changes in SOM over time is used in combination with the SMAF SOM index. Due to the variability of SOM within a field and due to variability in laboratory testing, a minimum level of change of approximately 10% of the starting SOM value is recommended to constitute a "change over time" score.

Different cropping and field topography situations can influence the optimal soil sampling method for a particular field. Follow the guidelines of your soil lab or university extension service.



## METRIC: SOIL, NUTRIENT & WATER QUALITY

### Feedback

*An important element of the pilot is to get your feedback on the process you went through to collect data for the metric and to get your overall impression of the metric itself.*

1. How many hours would you estimate you spent gathering the data for this metric?

---

2. Did you incur any expenses in gathering data other than man hours? If so, how much and what for?

---

---

---

---

3. Which data was the most difficult to gather and why? Besides the feedback given in the **Data Availability** column, do you have additional feedback about gathering the data?

---

---

---

---

4. What is your overall impression of the metric and how it can benefit your operations?

---

---

---

---

5. What suggestions do you have for improving this metric?

---

---

---

---