

Willamette Valley Soil Quality Card Guide

To accompany
the Willamette Valley
Soil Quality Card

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Credits

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Additional copies

The *Willamette Valley Soil Quality Card* (EM 8711) and the *Willamette Valley Soil Quality Card Guide* (EM 8710) are available at local OSU Extension Service, NRCS, and Soil and Water Conservation District offices or from Extension & Station Communications, Oregon State University, 422 Kerr Administration, Corvallis, OR 97331-2119.

Willamette Valley

Soil Quality Card Guide

Farmers, conservationists, and other land managers need reliable methods to assess soil quality so they can make management decisions that maintain long-term soil productivity. A group of Oregon farmers has identified 10 soil-quality indicators for the Willamette Valley that can assess the impact of soil management. These indicators are specific to the cropping systems of the Willamette Valley.

These soil-quality indicators have been integrated into the *Willamette Valley Soil Quality Card*, EM 8711, which will help land managers evaluate the condition of agricultural soils. This Guide is designed to supplement the Soil Quality Card by providing information on the role of management, explaining why the soil-quality indicators are important, and giving detailed methods for judging them.

Each field soil that is assessed will start from a unique baseline or reference point, and the changes in indicators from year to year will show how management is affecting soil quality. An important point to remember is that soil-quality indicators are different than inherent soil characteristics, such as clay content, that are not affected by management.

Soil-quality indicators are highly interrelated. For example, conditions of soil structure such as aggregate stability, compaction, and pore size influence and are influenced by the activities of earthworms and other soil organisms. Water infiltration and availability, which are controlled by surface and subsurface soil structure, affect plant root growth and plant health. Organic residue and root biomass from crop plants feed soil organisms and contribute to soil organic matter, which in turn enhances soil structure. These interrelationships begin to show the complexity of soil systems.

How to use this Guide

For each indicator, this Guide contains:

- A description of the indicator
- An explanation of why the indicator is important for judging soil quality
- A discussion of how management affects the indicator
- Suggestions for when to assess the indicator
- Instructions for performing an accurate assessment

The assessment calendar on page 2 shows the times of the year that are best suited for assessment of each soil indicator. Times vary according to the crop grown, but it is important to maintain as much consistency as possible from year to year in the assessment of each field. Assessments of some or all of the indicators more than once a year also provide a clearer picture of potential changes in soil quality.

Several indicators include instructions for performing both a basic and a more rigorous assessment. The rigorous assessments give more precise information, but require more time and equipment than the basic assessments.

Regardless of the method used, accuracy increases if the same test or observation is done in several representative locations within a field to get an average rating for the indicator. Assessments performed consistently and carefully each year yield the most reliable information on soil quality.

Suggested Assessment Calendar

Indicator	Before planting	Active crop growth		Late fall	Winter
	Early spring	Spring	Summer/Fall		
1. Soil structure and tilth	✓	✓	✓	✓	
2. Compacted layers	✓	✓	✓	✓	✓
3. Workability		✓		✓	
4. Soil organisms	✓	✓		✓	✓
5. Earthworm abundance	✓	✓		✓	✓
6. Plant residue	✓	✓	✓	✓	✓
7. Plant vigor		✓	✓		
8. Root growth		✓	✓		
9. Water infiltration	✓	✓	✓	✓	✓
10. Water availability		✓	✓		

Management, crop, and climatic factors determine the optimum time of soil quality assessment. The assessment times in this calendar are appropriate for the Willamette Valley of western Oregon.