



Soil Quality Institute

Products and Services Catalog

<http://soils.usda.gov/sqi>

The Soil Quality Institute identifies soil quality research findings and practical technologies that help conserve and improve soil, and enhance farming, ranching, forestry, and gardening enterprises. The Institute works with researchers, conservationists, and land managers to develop these technologies and make them readily available.

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Most products are available on the SQI Web site (soils.usda.gov/sqi). For further information about SQI products, contact Ann Lewandowski at alewand@soils.umn.edu, 612-624-6765.

General Soil Quality

Soil Quality Information Sheets

One-page introductions to soil quality topics for NRCS staff, partners, and customers. From the National Soil Survey Center, SQI, and the ARS National Soil Tilth Laboratory. Current titles include the following. (96-01)

Original Cropland Series:

- Soil Quality – Introduction
- Indicators for Soil Quality Evaluation:
 - Organic Matter
 - Soil Crusts
 - pH
 - Infiltration
 - Aggregate Stability
- Soil Quality Resource Concerns:
 - Soil Erosion
 - Compaction
 - Salinization
 - Pesticides
 - Soil Biodiversity
 - Hydrophobicity
 - Sediment Deposition on Cropland
 - Available Water Capacity

Rangeland Soil Quality Series:

- Introduction
- Indicators for Assessment and Monitoring
- Compaction
- Infiltration
- Organic Matter
- Soil Biota
- Water Erosion
- Wind Erosion
- Aggregate Stability
- Physical and Biological Soil Crusts

Pastureland Soil Quality Series:

- Introduction
- Indicators for Assessment and Monitoring

➤ Available on web site. Order copies from the Landcare office: landcare@swcs.org or 1-888-LANDCARE.

Rangeland Soil Quality Information Sheets Poster

Use to describe and promote the Rangeland Soil Quality Information Sheets. (2001)

➤ Available on web site.

Soil Quality Institute Business Plan

- Available on web site.

Soil Quality Institute Pamphlet

Defines soil quality, describes the work of the Soil Quality Institute, and lists contact information. (Aug02)

- Available on web site. Order hard copies from the Landcare office at landcare@swcs.org or 1-888-LANDCARE.

“The Soil Quality Concept” Booklet

Contains reprints of eight key journal articles describing the concepts of soil quality. (October 1996)

- Order hard copies from margaret.hitz@nssc.nrcs.usda.gov. Web site lists citations to the eight articles.

Glossary of Soil Quality Terms (Jun02)

- Available on web site.

Soil Quality Thunderbook

Use this packet to help you organize your soil quality information. It includes a cover and spine to slip into the cover of a three-ring binder, labeled divider tabs, a soil quality glossary, a bibliography, and suggestions for sources of soil quality information. (Apr99)

- Available on web site.

“Soil Changes Following 18 Years of Protection from Grazing in Arizona Chaparral”

Brejda, John J. 1997. *The Southwestern Naturalist* 42 (4): p. 478-487.

Results of a study that compared changes in physical and chemical properties of a chaparral soil protected from grazing for 18 years. It describes these changes relative to succession and threshold paradigms.

- Available at major research libraries.

“Soil Resilience: A Fundamental Component of Soil Quality”

Seybold, C.A., J.E. Herrick, and J.J. Brejda. 1999. Soil resilience: A fundamental component of soil quality. *Soil Science* 164:224-234.

This journal article addresses the concept of soil resilience and its relationship to soil quality. It provides a review of the literature on the assessment and quantification of resilience. The paper was prepared for the Natl. Coop. Soil Survey Conf. in Baton Rouge, LA (June 1997).

- Available at major research libraries.

Soil Quality Assessment

Guidelines for Soil Quality Assessment in Conservation Planning

Provides guidelines primarily for assessing soil quality in the context of the 9-step conservation planning process, but it is also useful in informal soil quality assessments, or as an educational resource. Illustrates the practical use of tools and information developed by SQI, and links soil quality assessment to specific practices that help solve soil quality problems. (Jan01)

- Available on web site.

Soil Quality Test Kit Guide

Adapted from the ARS Soil Health Kit and designed for use by NRCS field staff, SWCDs, and ag consultants. Measurements included are pH, electrical conductivity, soil nitrate-N, bulk density, respiration, infiltration, aggregate stability, soil slaking, earthworms, water quality, and soil physical observations and estimations. The Guide includes instructions for building a kit, conducting the tests, and evaluating test results. **Spanish version** also available. The **Test Kit Worksheet** is an Excel file set up to do all necessary calculations. (Aug98)

- Available on web site.

Soil Quality Card Design Guide

The Guide gives instructions for conducting farmer focus sessions to develop local Soil Quality/Health Cards. A Card is a qualitative field assessment tool developed by farmers for farmers to monitor soil quality from year to year or to compare practices. Conservationists can use it in locally led conservation, education, and information activities. The SQI developed the procedures and the Guide in collaboration with Oregon State University, OSU Cooperative Extension Service, Univ. of Maryland, and NRCS staff in OR, MD, MT, ND, and NM. (May99)

➤ *Available on web site.*

Soil Quality Card Examples

Developed by farmers and conservationists around the country.

➤ *Available on web site.*

State and Transition Models and Dynamic Soil Properties Databases.

Text from the proceedings of the National Cooperative Soil Survey Conference in Ft. Collins in June 2001. The paper described how state and transition models have been applied in rangelands of the western United States and how the model can provide a framework for an information system that includes dynamic soil properties.

➤ *Available on web site.*

Assessment of Soil Quality

Mausbach, M.J. and C.A. Seybold. 1998. P. 33-43. In: R. Lal (ed.) *Soil Quality and Agricultural Sustainability*. Ann Arbor Press, Chelsea, MI.

Discusses the assessment of soil quality at various scales, ranging from field to national. The article reviews the definition of soil quality with a discussion of indicators, reference values, and assessments.

➤ *Available at major research libraries.*

Quantification of Soil Quality

Seybold, C.A., M.J. Mausbach, D.L. Karlen, and H.H. Rogers. 1998. P. 387-404. In: R. Lal, J.M. Kimble, R.F. Follet, and B.A. Steward (eds.) *Soil processes and the carbon cycle*. Advances in Soil Science. Chapt, 27. CRC Press, Boca Raton, Florida.

Discusses approaches to quantifying soil quality and recommends a framework for measuring and assessing soil quality. The chapter reviews definitions, indicators, indices of soil quality; minimum data sets; and effects of scale.

➤ *Available at major research libraries.*

USDA soil quality test kit: Approaches for comparative assessments

Seybold, C.A., R.P. Dick, and F.J. Pierce. 2001. *Soil Survey Horizons* 42(2):43-52.

This journal publication uses real case studies to describe three approaches for assessing soil quality using the Soil Quality Test Kit. The background and history of the development of the test kit are also discussed.

➤ *Available at major research libraries.*

Aggregate stability kit for soil quality assessments

Seybold, C.A. and J.E. Herrick. 2001. *Catena* 44(1):37-45.

A description of the aggregate stability test that is included in the soil quality test kit guide. The kit method is compared to the commonly used laboratory aggregate stability method using a range of soils varying in texture. Detailed information is provided for on constructing an aggregate stability kit which can run 8 samples at a time.

➤ *Available at major research libraries.*

On-Farm Tests Indicate Effects of Long-Term Tillage Systems on Soil Quality

Seybold, C., M. Hubbs, and D. Tylor. 2001. *J. Sustainable Agric.* 19(4):61-74.

The soil quality test kit is used to compare soil quality on long-term no-till versus conventional tillage systems on a silt loam soil in Tennessee. Results showed that the no-till (and higher biomass producing) management system significantly improved surface soil properties over the conventionally tilled management system.

➤ *Available at major research libraries.*

Soil Management

Managing Soil Organic Matter: The Key to Air and Water Quality.

A 4-page technical note suitable for broad distribution. (Aug 2003)

- *Order hard copies from the Landcare office at landcare@swcs.org or 1-888-LANDCARE.*

Soil Conditioning Index

An easy-to-use, Excel-based model to predict the effect of a crop management system on soil organic matter trends. (Oct02)

- *Excel file and Users' Guide available on web site.*

Crop Residue Removal for Biofuel Production

A literature review examining the effect of crop residue removal on water quality and soil quality. (Mar03)

- *Available on web site.*

Soil Quality-Agronomy Technical Notes

This series describes the effects of conservation practices on soil quality. Intended for NRCS field staff use.

Current titles:

1. Cover and Green Manure Crop Benefits to Soil Quality (Apr96)
2. Conservation Crop Rotation Effects on Soil Quality (Aug96)
3. Effects of Residue Management, No-till on Soil Quality (Oct96)
4. Effect of Soil Quality on Nutrient Efficiency (Aug97)
5. Herbicides (2001)
6. Legumes and Soil Quality (Mar98)
7. Effects of Erosion on Soil Productivity and Soil Quality (Aug98)
8. Liming to Improve Soil Quality in Acid Soils (May99)
9. Managing Conservation Tillage (May99)
10. Sunn Hemp: A Cover Crop for Southern and Tropical Farming Systems (May99)
11. Agricultural Management Effects on Earthworm Populations (Jun01)
12. Long-Term Ag. Management Effects on Soil Carbon (Aug01)
13. The Knife Roller (Crimper): An Alternative Kill Method for Cover Crops (Sep02)
14. Improving Soil Quality on the Southern Coastal Plain: One Farmer's Experience (Oct02)
15. Soil Quality and Vegetable Production: One Farmer's Experience (Oct02)
16. Interpreting the Soil Conditioning Index: A Tool for Measuring Soil Organic Matter Trends (Apr03)
17. Soil Compaction: Detection, Prevention and Alleviation (Fall 2003)

- *Available on web site.*

Soil Quality-Urban Technical Notes

1. Erosion and Sedimentation on Construction Sites (Mar00)
2. Urban Soil Compaction (Mar00)
3. Heavy Metal Soil Contamination (Sep00)

- *Available on web site.*

“Phosphorus in Agriculture” Pamphlet

Describes the importance of phosphorus in plant growth and the environmental impacts and management of agricultural phosphorus (Jan98).

- *Available on web site.*

The Minnesota Soil Management Series

Developed in cooperation with the Minnesota Institute for Sustainable Agriculture and University of Minnesota Extension. (2000)

- *View on-line or order from the University of Minnesota at www.extension.umn.edu/distribution/cropsystems/DC7398.html*

“Soil Quality Considerations in the Conversion of CRP Land to Crop Production” Presentation

A presentation made at the CRP-96 Conference, “Preparing for Future CRP Land Use in the Central and Southern Great Plains”, Amarillo, TX (Oct96).

- *Available on web site.*

Soil Biology

“Soil Biology Primer” Publication

An introduction to the living soil system for NRCS field staff, partners, and customers. This full color booklet describes the importance of soil organisms and the soil food web to soil productivity and water and air quality. It addresses how soil organisms are affected by management practices. The Primer is a collaborative effort of the SQI, the Conservation Technology Information Ctr., Oregon State University, the Ohio State University, and other scientists. (Aug99)

- *Order from the Soil and Water Conservation Society at www.swcs.org, or 1-800-THE-SOIL. Partly available on web site.*

Soil Biology Primer slide set

A PowerPoint file including many of the pictures from the Soil Biology Primer.

- *Available on web site.*

Soil Biology Classroom Activities

A set of three soil biology activities for use in K-12 classrooms. (Feb01)

- *Available on web site.*

“Introduction to Microbiotic Crusts”

Discusses microbiotic crusts, including what they are, where they occur, what their role is, and how they are affected by disturbance. This 13-page, color pamphlet was developed by the SQI in cooperation with the Grazing Lands Technology Institute. (Jul97)

- *Available on web site.*

Soil Biology Information Resources

For land managers, resource professionals, and educators. A list of web sites, Extension publications, booklets, articles, videos, classroom materials, and other soil biology resources. Some college-level materials are included, but the emphasis is on non-technical resources. (Nov02)

- *Available on web site.*

Training

Farmer Workshops for Locally Developed Conservation Tools (Soil Quality Cards)

Prepares NRCS staff and partners to conduct farmer/conservationist participatory workshops and to develop local soil quality/health cards. The basic principles of farmer participatory action and learning are presented. Participants practice a step-wise approach to lead farmers in identifying soil quality indicators, developing a rating system, and designing a local soil quality/health card. Take-home strategies to market and develop local soil health cards are developed. (Available on request to the SQI.)

Soil Quality: Assessment and Applications for Field Staff

The Soil Quality Institute and National Employee Development Center (NEDC) developed a soil quality course designed to provide field personnel with an overall understanding of soil quality. Participants will be able to recognize soil quality concerns, communicate those concerns to land managers and users, and provide alternatives to remedy those concerns in a manner that meets requirements of the agency and the land manager. The course is offered as train-the-trainer sessions. For more information, contact Mike Hubbs, 334-844-4741 Ext. 176, mike.hubbs@ftw.nrcs.usda.gov.

Outreach and Education

Soil Quality Card Design Guide

The Soil Quality Card Design Guide gives instructions for conducting farmer focus sessions to develop local Soil Quality/Health Cards. A Card is a qualitative field assessment tool developed by farmers for farmers. It is a do-it-yourself rating guide for farmers to monitor soil quality from year to year or to compare practices. Conservationists can use it in locally led conservation, education, and information activities. The SQI developed the procedures and the Guide in collaboration with Oregon State University, OSU Cooperative Extension Service, University of Maryland, and NRCS staff in OR, MD, MT, ND, and NM.

➤ *Available on web site.*

Soil Quality Clipart

A set of free clipart images represent soil, soil functions, farmers using a soil quality/health card, and the soil quality symbol.

➤ *Available on web site.*



Soil Quality Exhibit Poster

A 64" by 43" poster for use at exhibits to promote soil quality and associated soil management practices. Available in cropland and rangeland versions.

➤ *Available on web site.*

SQIforum: A Soil Quality E-mail List

This e-mail listserv facilitates communication among NRCS employees and partner conservationists. Subscribers may post messages related to the research and application of soil quality technology. To subscribe to the list send an e-mail message to: listproc@nrcs.usda.gov. In the body of the message write: subscribe SQIforum [your first and last name]

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