United States Department of Agriculture
Natural Resources Conservation Service

Soil Quality Activity – Soil Conditioning Index Thresholds

Soil Conditioning Index Thresholds

The Soil Conditioning Index (SCI) is a tool for determining soil carbon trend, e.g. increasing or decreasing amounts with time, used to estimate soil quality in agronomic systems. The SCI is affected by climate since temperature and precipitation affect biomass decomposition and carbon sequestration in soil.

Regional differences in soil properties and climatic effects on soil carbon accrual make it necessary to establish an equitable means for determining enhancement payments, which seek to reward farmers for their conservation efforts rather than their geographic location.

Consider the following example to illustrate this point for SCI:

> A continuous high residue no-till system in the southeastern US may only achieve an SCI of 0.6, while the same management in the Corn Belt may easily reach 1.0. Systems with more intense tillage and greater overall negative environmental impacts in the Corn Belt may achieve an SCI of 0.6 due to soil properties and climatic effects.

Regional thresholds along with appropriate incremental changes for the SCI, established for each watershed, will allow an equitable reward for equal conservation effort. Previously both systems receiving 0.6 scores in the example above would qualify for the same enhancement regardless of the farmer's conservation effort or climatic influence.

Benefits

Soil quality enhancement activities resulting in a positive trend in the SCI and soil carbon accrual; improve soil stability, aggregation, infiltration, nutrient cycling, and productivity. They also protect water and air resources by reducing runoff, water and wind erosion, and nutrient loss.

Criteria for Soil Conditioning Index Thresholds

This enhancement is based on a positive trend in the SCI.

It requires the implementation and maintenance of conservation practices that reduce soil disturbance, provide and manage crop residues, and/or provide additional sources of biomass for soil carbon accrual.

Examples of management activities that typically increase the SCI include, but are not limited to:

- Conservation tillage systems for residue management, such as no-till or strip-till
- Sod-based rotations or rotations using high residue crops
- Planting and managing cover crops
- Use of soil amendments, including green manure crops, animal manure, compost, and/or other organic by-products, in conjunction with a nutrient management plan.

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Thresholds and Increments for SCI Enhancements
Locally, minimum threshold SCI values are determined. The established threshold for a watershed is always a positive value, with a minimum starting point of 0.1.

Nationally, SCI values are considered in five increments. Each increment represents approximately equal conservation effort for farmers across the nation.

The national SCI enhancement increments are:

Enhancement Level	Criteria for level
1	watershed threshold SCI is met
2	SCI at threshold plus 0.15
3	SCI at threshold plus 0.30
4	SCI at threshold plus 0.45
5	SCI at threshold plus 0.60

References

SQ-Agronomy Tech Note #16 http://soils.usda.gov/sqi/management/files/sq_atn_16.pdf

Hubbs, M. D., M. L. Norfleet, and D. T. Lightle. 2002. Interpreting the SCI. . Spec. Rept no. 1. Alabama Agric. Expt. Stn. and Auburn University. P. 192-196